

UC Office of the President

Recent Work

Title

Associations Between Substance Use Problems and Stress During COVID-19.

Permalink

<https://escholarship.org/uc/item/7b42q9z5>

Journal

Journal of Studies on Alcohol and Drugs, 82(6)

ISSN

1937-1888

Authors

Vogel, Erin A
Chieng, Amy
Robinson, Athena
et al.

Publication Date

2021-11-01

DOI

10.15288/jsad.2021.82.776

Peer reviewed

Tables: 2 Figures: 0

Associations between Substance Use Problems and Stress During COVID-19

Erin A. Vogel, PhD¹, Amy Chieng, BA¹, Athena Robinson, PhD², Sarah Pajarito, MA², Judith J. Prochaska, PhD, MPH¹

¹Stanford Prevention Research Center, Department of Medicine, School of Medicine, Stanford University. *Address:* Medical School Office Building, 1265 Welch Road, MC 5411, Stanford, CA 94305

²Woebot Health, San Francisco, CA. *Address:* 650 5th St., San Francisco, CA 94107

Corresponding Author: Erin A. Vogel, Stanford Prevention Research Center, Department of Medicine, Stanford University, Medical School Office Building, X3C16, 1265 Welch Road, Stanford, CA, USA 94305-5411. Phone: (650) 724-3608. Fax: (650) 725-6247. Email: eavogel@stanford.edu

Funding: Conduct of the study was supported by the National Institute on Drug Abuse (NIDA) with a Small Business Innovations Research Award #R44-D048712. The article's contents are solely the responsibility of the authors and do not necessarily represent the official views of NIDA. Preparation of this manuscript was partially supported by the Tobacco-Related Disease Research Program (#28FT-0015).

Abstract

Objective: The COVID-19 pandemic has produced major life disruptions and increased stress.

We explored associations between pandemic-related stress and substance use problems.

Method: Adults (N=180) with problematic substance use (CAGE-AID>1) were recruited online

June–August 2020. Measures included the 15-item Short Inventory of Problems–Alcohol and

Drugs (SIP-AD), GAD 7-item anxiety measure, PHQ 8-item depression measure, 3-item

measure of pandemic life disruptions, 6-item measure of pandemic-related mental health effects,

and a 5-item measure of pandemic-related personal growth. Participants reported whether they

frequented bars and attended large gatherings. Participants with children (<18) in the home

completed a 4-item measure of pandemic-related worry about children’s well-being. Pandemic-

related measures with significant bivariate associations with SIP-AD, GAD, and PHQ scores

were tested in multivariable linear regression, adjusting for sex, age, and race/ethnicity. **Results:**

Participants who struggled with responsibilities at home, had greater mental health impacts,

greater personal growth, and frequented bars or large gatherings had higher SIP-AD scores (all

p-values<.05). Participants who struggled with responsibilities at home, had difficulty getting

necessities, had greater mental health impacts, and worried more about their children had higher

GAD-7 and PHQ-8 scores (all p-values<.05). Participants who lost a job or income during the

pandemic had higher PHQ-8 scores (p=.015). In multivariable analyses, greater mental health

impacts were associated with higher SIP-AD, PHQ-8 and GAD-7 scores (all p-values<.05).

Conclusions: Experiencing worsened mental health symptoms during COVID-19 was associated

with more substance use problems and depression and anxiety symptoms. Pandemic disruptions

may exacerbate preexisting substance use problems.

Introduction

The COVID-19 pandemic has produced major disruptions in daily life. A recent review concluded that the world population is experiencing increased stress, anxiety, and depression due to the pandemic and associated mitigation measures (dos Santos et al., 2020). In late June 2020, 40% of U.S. adults reported experiencing mental health symptoms, a stress disorder, or increasing substance use to cope with pandemic-related stress (Czeisler et al., 2020). Individuals with problematic substance use are particularly vulnerable to COVID-19 illness (Baillargeon et al., In press) and psychosocial effects of the pandemic, such as stress and substance use treatment disruptions (Warfield et al., In press). Disruptions in treatment increase risk of overdose, a serious complication of substance use disorders (Linás et al., 2021). Moreover, depression and anxiety commonly co-occur with substance use disorders (Grant et al., 2004). Evidence suggests that in the general population, increases in alcohol consumption during COVID-19 may be driven by stress, depression, and anxiety (Sallie et al., 2020). Effects may be even more pronounced among individuals with problematic substance use. Periods of intense stress can give light to pre-existing fissures and vulnerabilities in people's daily lives. A better understanding of substance use problems, depressive symptoms, and anxiety during the COVID-19 pandemic among people with problematic substance use can inform intervention efforts needed now and post-pandemic.

Various pandemic-related situational factors may differentially affect substance use problems (i.e., consequences of substance use). According to behavioral economics, the COVID-19 pandemic and associated mitigation measures may decrease the negative consequences of substance use (Acuff et al., In press). Many individuals are now working from home and have a

more flexible schedule, making some of the negative consequences of substance use (e.g., being unable to get to work on time) less relevant than before the pandemic. Simultaneously, the pandemic has limited the availability of alternative rewarding activities that are incompatible with substance use (e.g., educational activities, volunteer work). Substance use and associated problems may increase if individuals are home more often and unable to engage in their usual activities, especially in the evenings (Acuff, et al., In press). Moreover, other responsibilities at home (e.g., childcare) may have increased during the pandemic. New consequences associated with substance use may emerge as lifestyles, schedules, and responsibilities shift. In sum, relationships between pandemic-related lifestyle factors, substance use, and substance use problems are likely complex and multifaceted. To better understand how individuals with problematic substance use are experiencing the pandemic, this exploratory, cross-sectional study examined associations between substance use problems, mental health symptoms, and pandemic-related increased family responsibilities and stressors.

Method

Participants, Design, and Procedure

Participants were recruited June 25 to August 18, 2020 for a randomized controlled trial of Woebot for Substance Use Disorders, a novel digital therapeutic for reducing problematic substance use. Participants were recruited through Qualtrics Research Services, Stanford University listservs, a Facebook advertising campaign, and word-of-mouth. Eligibility criteria were U.S. residence, age 18-65, English literate, owning a smart phone, with past-year use of a substance, and problematic substance use (CAGE-AID score ≥ 2). Exclusion criteria were history of severe alcohol or drug withdrawal, liver conditions, opioid overdose, or psychotic symptoms;

past-year suicide attempt; past-year medical problems from drug or alcohol use; opioid use without concurrent medication-assisted treatment; past Woebot use; and pregnancy. The study protocol, approved by Stanford IRB, randomized consented participants to the Woebot for Substance Use Disorders intervention for 8 weeks or to a waitlist control condition. Only baseline measures, completed prior to randomization, were analyzed in the present study. Participants received a \$25 Amazon gift card for completing the baseline survey.

Measures

Substance use. Participants reported past-month use of alcohol, cannabis, cocaine, prescription stimulants, methamphetamine, inhalants, sedatives or sleeping pills, hallucinogens, street opioids, and prescription opioids and identified their primary and secondary substances of abuse. The 15-item ($\alpha=.95$) Short Inventory of Problems—Alcohol and Drugs (SIP-AD) measured substance use consequences (Blanchard et al., 2003).

COVID-19 pandemic effects. Individual items assessed as yes/no were job or income loss, struggle with responsibilities at home, and difficulty getting necessities due to the pandemic (Lang, 2020). Participants with children in the home completed a 4-item measure ($\alpha=.96$) of worry about children's well-being (physical, social, emotional, and educational) in the past two weeks (0=never, 4=most of the time) calculated as an average score.

COVID-19 mental health impact. A 6-item measure ($\alpha=.80$) assessed for the past two weeks: (1) consuming media about or thinking about COVID-19 and (2) worrying about health (both reported as 0=never to 4=most of the time); (3) stressfulness of changes in social contacts, (4) stressfulness of changes in one's way of life, and (5) worsening of mental/emotional health (all reported as 0=not at all to 4=extremely); and (6) sleep disruption (1=sleeping a lot more to

5=sleeping a lot less; coded as 0=no disruption, 1=mild disruption, 2=major disruption).

Summed items yielded a mental health impact score (Lang, 2020).

COVID-19 personal growth. Five personal growth outcomes related to the pandemic were assessed for the past two weeks ($\alpha=.89$): strengthening relationships, creating new possibilities, helping identify personal strengths, creating spiritual change, and increasing appreciation of life (0=not at all to 4=extremely). Summed items yielded a personal growth score (Lang, 2020).

COVID-19 precautions. Individual items assessed COVID-19 precautions for the past two weeks: staying/working at home, avoiding large social gatherings, avoiding small social gatherings, avoiding bars, and avoiding non-essential travel (Lavoie & Bacon, 2020). Items were scored as 1 (most of the time) versus 0 (some of the time, seldom, or never) and examined individually.

Depression and anxiety. Depressive symptoms were measured with the 8-item ($\alpha=.90$) Patient Health Questionnaire-8 (PHQ-8) (Kroenke et al., 2009). Anxiety symptoms were measured using the 7-item ($\alpha=.93$) Generalized Anxiety Disorder (GAD-7) (Spitzer et al., 2006).

Sociodemographics. Participants reported their sex (male/female), age, race/ethnicity, marital status (married/partnered/cohabitating vs. widowed, divorced/separated or single), education (college degree vs. no college degree), pre-COVID employment (Lavoie & Bacon, 2020), effects of COVID-19 on their work (original item), and number of children in the home (Lavoie & Bacon, 2020).

Analyses

Bivariate analyses tested associations of COVID-19 measures with substance use problems (SIP-AD) depressive symptoms (PHQ-8), and anxiety symptoms (GAD-7). Given the novelty of COVID-19, all analyses were exploratory, and we did not correct for multiple comparisons. In three multivariable linear regressions, SIP-AD, PHQ-8, and GAD-7 scores were entered as dependent variables and significant bivariate correlates of each were entered as independent variables, adjusting for age, sex, marital status, education, and race/ethnicity.

Results

The sample ($N=180$) was 65.0% female, age $M=40.3$ ($SD=11.6$), and 67.8% non-Hispanic white. Most (74.4%) were employed pre-COVID and 70.6% had a college degree. Over half (56.1%) were married, partnered, or cohabitating, and 42.8% had children at home. Most reported past-month use of alcohol (85.0%) and cannabis (54.4%); 63.3% identified alcohol as their primary substance of abuse. Examining pandemic effects, 26.1% reported losing a job or income due to the pandemic; 40.6% struggled with responsibilities at home, and 21.1% had difficulty getting necessities. On average, participants with children at home reported worrying about their children's well-being occasionally to often ($M=2.73$, $SD=1.12$, range=0-4). Average mental health impacts were around the midpoint of the scale ($M=12.17$, $SD=4.69$, range=0-22). Perceived personal growth was generally low and variable ($M=5.69$, $SD=5.06$, range=0-20). Most reported avoiding in-person small gatherings (51.4%), non-essential travel (57.1%), work/school (58.9%), bars (77.9%), and large gatherings (82.2%). Substance use problems, on average, were generally low but variable ($M=12.43$, $SD=10.53$, range=0-45). Average PHQ-8 ($M=8.86$, $SD=6.03$, range=0-24) and GAD-7 ($M=7.92$, $SD=5.95$, range=0-21) scores reflected mild depression and anxiety.

Correlations between substance use problems, pandemic impacts and behaviors, and mental health symptoms are presented in Table 1. Significant correlations indicated that participants who, during COVID-19, struggled with responsibilities at home, had greater mental health impacts, greater personal growth, frequented bars or large gatherings, and reported more depression and anxiety symptoms had higher SIP-AD scores. Participants who, during COVID-19, struggled with responsibilities at home, had difficulty getting necessities, had greater mental health impacts, and worried more about their children had higher GAD-7 and PHQ-8 scores. Anxiety and depression scores were highly correlated. Participants who lost a job or income during the pandemic had higher PHQ-8 scores. Struggling with home responsibilities was associated with job or income loss, greater difficulty getting necessities, greater pandemic mental health impacts, less personal growth during the pandemic, avoiding large gatherings, and avoiding school or work. Difficulty getting necessities was associated with greater mental health impacts. Personal growth was associated with lower likelihood of avoiding large gatherings, and worrying about one's children was associated with greater likelihood of avoiding non-essential travel. The COVID-19 precautions were significantly associated with each other.

Multivariable analyses are presented in Table 2. Participants with greater pandemic-related mental health effects had higher SIP-AD, PHQ-8, and GAD-7 scores. Younger participants had higher SIP-AD scores, and participants without a college degree had higher GAD-7 scores ($M=8.75$, $SD=6.47$ vs. $M=7.57$, $SD=5.71$). Age was not associated with GAD-7 or PHQ-8 scores, and education was not associated with SIP-AD or PHQ-8 scores. Sex, race/ethnicity, marital status, and other pandemic-related variables were not associated with SIP-AD, GAD-7, or PHQ-8 scores. Because only participants with children completed the “worries about children” measure, we repeated the GAD-7 and PHQ-8 models excluding this variable. In

the full sample, females had higher GAD-7 scores than males ($M=8.70$, $SD=5.91$ vs. $M=6.46$, $SD=5.80$; $\beta=-.15$, $t=-2.01$, $p=.046$). Otherwise, only pandemic-related mental health effects remained associated with GAD-7 and PHQ-8 scores.

Discussion

During the COVID-19 pandemic, 40.6% of surveyed adults with substance use problems reported struggling with responsibilities at home. Struggling with responsibilities at home during the pandemic was associated with more substance use problems and greater depression and anxiety symptoms. Obtaining, using, and recovering from substances can impair one's ability to fulfill obligations. New responsibilities resulting from the pandemic, such as full-time childcare due to school closures, may be difficult to fulfill while struggling with substance use. Results are consistent with extant literature showing that unpaid caregiving (for adults) during COVID-19 was associated with increased substance use (Czeisler, et al., 2020). Individuals struggling with substance use, anxiety, and depression may need support in meeting their own needs as well as their family's needs during the pandemic.

Additionally, frequenting bars or large gatherings, experiencing negative mental health effects, and perceiving more positive personal growth from the pandemic were associated with more substance use problems. Difficulty getting necessities, experiencing more negative mental health effects, and greater worry about one's children's well-being was associated with greater depression and anxiety symptoms. In multivariable models, controlling for demographic characteristics, negative mental health effects of the pandemic were the strongest correlate of substance use problems, depressive symptoms, and anxiety symptoms. Participants with high scores on this measure reported frequently thinking about COVID-19, worrying about their health and/or the health of their family and friends, experiencing stress due to changes in social

contacts and their lifestyles, worsening of their mental/emotional health, and sleep disruptions. Findings suggest that the COVID-19 pandemic is producing major concerns that may contribute to mental health symptoms, including problematic substance use. Many individuals are using substances to cope with stress and uncertainty around the pandemic (Czeisler, et al., 2020). A nationally representative sample of U.S. adults conducted early in the pandemic identified increased risk of depressive symptoms among people with lower income, fewer savings, and more stressors (Ettman et al., 2020). People with problematic substance use may also be at elevated risk for depressive symptoms. While some evidence suggests that pandemic-induced psychological distress is lessening in the United States (Robinson & Daly, 2020), people with problematic substance use are vulnerable to the negative effects of the pandemic (Satre et al., 2020; Warfield, et al., In press).

In this study, participants with more substance use problems were less likely to avoid bars and large gatherings, corroborating concerns that substance use may increase risk of contracting COVID-19 (Satre, et al., 2020). Participants struggling to control their substance use may have found it difficult to avoid settings in which they use. Paradoxically, individuals with greater substance use problems also perceived greater personal growth from the pandemic in the forms of strengthened relationships, new possibilities, awareness of personal strength, spiritual change, and increased appreciation of life. People with problematic substance use often experience intense emotions (Kober, 2014). Experiencing intense emotions may have led individuals with substance use problems to be deeply affected by both positive and negative pandemic-related changes. Additionally, perceiving greater personal growth was associated with lower likelihood of struggling with responsibilities at home and lower likelihood of avoiding

large gatherings. Participants who perceived personal growth may be a subset whose daily lives were less strongly affected by the pandemic.

Limitations and Future Directions

Study data are cross-sectional, and causal pathways cannot be determined. There may be bidirectional relationships between substance use problems and pandemic-related mental health symptoms and stressors. While pandemic-related stress may have worsened mental health symptoms and substance use, it is also plausible that individuals with preexisting mental health symptoms and more substance use problems were negatively impacted by the pandemic than those with milder symptoms. Longitudinal research is needed to fully understand how substance use and pandemic-related circumstances may impact one another. The study was exploratory and was intended to be hypothesis-generating rather than hypothesis-confirming. Results are also subject to recall bias, as all measures were self-reported. Participants may have had difficulty accurately reporting their substance use and mental health symptoms from the past two weeks. Data were not collected on general life stressors unrelated to the pandemic. Individuals with high levels of stress may have experienced more pandemic-related stressors, mental health symptoms, and substance use problems. Lastly, the sample was predominantly non-Hispanic white. People of color are at increased risk of contracting and experiencing complications from COVID-19 (Artiga et al., 2020). Moreover, Hispanic and Black individuals were more likely to report increased substance use than non-Hispanic white or Asian adults, potentially due to increased stress (Czeisler, et al., 2020). Different vulnerabilities may interact to influence experiences of the pandemic. All participants were enrolled in a clinical trial, were not experiencing severe medical problems from their substance use, owned smartphones, and were proficient in English. Hence, findings may not generalize to more impoverished, medically complicated, or diverse

groups. Future research into pandemic-related stressors and substance use should aim to recruit a more diverse sample.

Conclusions

The COVID-19 pandemic has produced many difficulties for people with problematic substance use, including decreased in-person support and disruptions in daily routines. In this study of adults with problematic substance use, pandemic-related stressors were associated with greater substance use problems, depressive symptoms, and anxiety symptoms. People with problematic substance use may need additional support fulfilling responsibilities and managing mental health symptoms during the pandemic. Although the pandemic is time-limited, it has produced many profoundly negative effects (e.g., loss of loved ones, economic hardship) that will likely persist. Experiencing chronic stress may exacerbate substance use among vulnerable individuals. In addition to pandemic-related stress, many people with problematic substance use experienced mental health symptoms and chronic stressors prior to the pandemic. Reopening schools may help ease the burden of managing responsibilities at home. As the pandemic recedes, resources for people struggling with problematic substance use should prioritize childcare and affordable, accessible mental health support.

References

- Acuff, S. F., Tucker, J. A., & Murphy, J. G. (In press). Behavioral economics of substance use: Understanding and reducing harmful use during the COVID-19 pandemic. *Experimental and Clinical Psychopharmacology*. doi:10.1037/pha0000431
- Artiga, S., Garfield, R., & Orgera, K. (2020). *Communities of color at higher risk for health and economic challenges due to COVID-19*. Retrieved from <https://www.kff.org/coronavirus-covid-19/issue-brief/communities-of-color-at-higher-risk-for-health-and-economic-challenges-due-to-covid-19/>
- Baillargeon, J., Polychronopoulou, E., Kuo, Y.-F., & Raji, M. A. (In press). The impact of substance use disorder on COVID-19 outcomes. *Psychiatric Services in Advance*. doi:10.1176/appi.ps.202000534
- Blanchard, K. A., Morgenstern, J., Morgan, T. J., Labouvie, E. W., & Bux, D. A. (2003). Assessing consequences of substance use: Psychometric properties of the Inventory of Drug Use Consequences. *Psychol Addict Behav*, 17(4), 328-331. doi:10.1037/0893-164X.17.4.328
- Czeisler, M. É., Lane, R. I., Petrosky, E., Wiley, J. F., Christensen, A., Njai, R., . . . Rajaratnam, S. M. W. (2020). Mental health, substance use, and suicidal ideation during the COVID-19 pandemic— United States, June 24-30, 2020. *MMWR*, 69(32), 1049-1057.
- dos Santos, C. F., Picó-Pérez, M., & Morgado, P. (2020). COVID-19 and mental health— what do we know so far? *Front Psychiatry*, 11, 565698. doi:10.3389/fpsy.2020.565698
- Ettman, C. K., Abdalla, S. M., Cohen, G. H., Sampson, L., Vivier, P. M., & Galea, S. (2020). Prevalence of depression symptoms in US adults before and during the COVID-19 pandemic. *JAMA Netw Open*, 3(9), e2019686. doi:10.1001/jamanetworkopen.2020.19686 (
- Grant, B. F., Stinson, F. S., Dawson, D. A., Chou, P., Dufour, M. C., Compton, W., . . . Kaplan, K. (2004). Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch Gen Psychiatry*, 61(8), 807-816. doi:10.1001/archpsyc.61.8.807

- Kober, H. (2014). Emotion regulation in substance use disorders. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 428-446): The Guilford Press.
- Kroenke, K., Strine, T. W., Spitzer, R. L., Williams, J. B. W., Berry, J. T., & Mokdad, A. H. (2009). The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders, 114*(1), 163-173. doi:<https://doi.org/10.1016/j.jad.2008.06.026>
- Lang, A. J. (2020). Complementary and Integrative Research (CAIR) Pandemic Impact Questionnaire (C-PIQ). San Diego, CA: Complementary and Integrative Research (CAIR) Lab.
- Lavoie, K., & Bacon, S. (2020). International COVID-19 Awareness and Responses Evaluation (iCARE) Study. Montreal, Québec: Montreal Behavioural Medicine Centre.
- Linas, B. P., Savinkina, A., Barbosa, C., Mueller, P. P., Cerdá, M., Keyes, K., & Chhatwal, J. (2021). A clash of epidemics: Impact of the COVID-19 pandemic response on opioid overdose. *Journal of Substance Abuse Treatment, 108*158. doi:10.1016/j.jsat.2020.108158
- Robinson, E., & Daly, M. (2020). Explaining the rise and fall of psychological distress during the COVID-19 crisis in the United States: Longitudinal evidence from the Understanding America Study. *British Journal of Health Psychology, 100*. doi:10.1111/bjhp.12493
- Sallie, S. N., Ritou, V., Bowden-Jones, H., & Voon, V. (2020). Assessing international alcohol consumption patterns during isolation from the COVID-19 pandemic using an online survey: highlighting negative emotionality mechanisms. *BMJ Open, 10*, e044276. doi:10.1136/bmjopen-2020-044276
- Satre, D. D., Iturralde, E., Ghadiali, M., Young-Wolff, K. C., Campbell, C. I., Leibowitz, A. S., & Sterling, S. A. (2020). Treatment for anxiety and substance use disorders during the COVID-19 pandemic: Challenges and strategies. *J Addict Med, 14*, e293-e296. doi:10.1097/ADM.0000000000000755
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A Brief Measure for Assessing Generalized Anxiety Disorder: The GAD-7. *Archives of Internal Medicine, 166*(10), 1092-1097. doi:10.1001/archinte.166.10.1092
- Warfield, S. C., Pack, R. P., Degenhardt, L., Larney, S., Bharat, C., Ashrafioun, L., . . . Bossarte, R. M. (In press). The next wave? Mental health comorbidities and patients with substance use disorders in under-resourced and rural areas. *Journal of Substance Abuse Treatment*. doi:10.1016/j.jsat.2020.108189

Table 1. Correlations between substance use problems, mental health symptoms, and COVID-19 challenges and precautions.

	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Substance use problems (SIP-AD score)	.51*** &	.43*** &	.01¥	.15**¥	.06¥	.25*** &	.15**&	.00&	-.20* ¥	-.19* ¥	.07¥	-.11¥	-.15¥
2. Depressive symptoms (PHQ-8 score)	1	.78*** &	.18* ¥	.30*** ¥	.18**¥	.45*** &	.01&	.39*** &	.00¥	.03¥	-.01¥	.00¥	-.06¥
3. Anxiety symptoms (GAD-7 score)		1	.13¥	.28*** ¥	.19**¥	.53*** &	-.01&	.42*** &	.00¥	-.02¥	-.07¥	-.09¥	.08¥
4. Lost job or income			1	.44*** φ	.28***φ	.30***¥	-.03¥	.07¥	-.01φ	.04φ	.01φ	.17*φ	.05φ
5. Struggle with home responsibilities				1	.35***φ	.51***¥	-.20** ¥	.20¥	.07φ	.18*φ	.08φ	.23**φ	.15φ
6. Difficulty getting necessities					1	.37***¥	-.14¥	.16¥	.08φ	.02φ	.11φ	.01φ	.01φ
7. Mental health impacts						1	-.05&	.51*** &	.16*¥	.10¥	.04¥	.20*¥	.18**¥
8. Personal growth							1	.09&	-.10¥	-.21* *¥	-.01¥	.00¥	-.06¥
9. Worries about children [†]								1	.16¥	.10¥	.19¥	.15¥	.24**¥
10. Avoid bars									1	.58** *φ	.27*** φ	.30*** φ	.42*** φ
11. Avoid large gatherings										1	.33*** φ	.33*** φ	.44*** φ
12. Avoid small gatherings											1	.26*** φ	.32*** φ
13. Avoid school/work												1	.30*** φ
14. Avoid non-essential travel													1

*p < .05

**p < .01

***p < .001

&Pearson's correlation

‡Pearson's point-biserial correlation

¶Phi coefficient

†Only measured among participants with children (under age 18) in the home

Table 2. Multivariable associations between substance use problems, mental health symptoms, and COVID-19 challenges and precautions

	SIP-AD Scores			PHQ-8 Scores			GAD-7 Scores		
	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>
Step 1									
Sex (Ref: female)	.10	1.27	.206	-.12	-1.01	.316	-.08	-.67	.506
Race (Ref: non-Hispanic white)	-.03	-.31	.756	.004	.04	.972	-.07	-.61	.544
Age	-.18	-2.13	.034	.08	.66	.513	-.43	-.37	.714
Marital status (Ref: not married)	-.02	-.28	.779	-.04	-.29	.770	.15	1.35	.181
Education (Ref: no college degree)	-.01	-.15	.884	-.15	-1.24	.220	-2.81	-2.41	.019
Step 2									
Struggled with responsibilities	.10	1.12	.267	.04	.30	.764	-.07	-.61	.543
Mental health effects	.22	2.53	.013	.39	2.75	.008	.51	3.99	<.001
Personal growth	.11	1.31	.193	-	-	-	-	-	-
Avoided bars	-.14	-1.45	.148	-	-	-	-	-	-
Avoided large gatherings	-.10	-1.06	.293	-	-	-	-	-	-
Lost job or income	-	-	-	-.01	-.10	.924	-	-	-
Had difficulty getting necessities	-	-	-	-.03	-.23	.821	-.04	-.35	.726
Worries about children	-	-	-	.16	1.28	.205	.11	.94	.350