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Changes in alcohol use since the onset of COVID-19 are associated with psychological distress among sexual and gender minority university students in the U.S

John P. Salerno a,*, Cho-Hee Shrader b, Angel B. Algarin c, Ji-Young Lee d, Jessica N. Fish e

a Department of Behavioral & Community Health, School of Public Health, University of Maryland, 4200 Valley Drive, Suite 1234, College Park, MD, 20742, USA
b Department of Public Health Sciences, University of Miami, 1120 NW 14th Street, CRB 906, Miami, FL, 33136, USA
c Division of Infectious Diseases and Global Public Health, University of California San Diego, 9500 Gilman Drive La Jolla, CA, 92093, USA
d Northwestern University, Institute for Sexual and Gender Minority Health and Wellbeing, 625 N. Michigan Avenue, Suite 1400, Chicago, IL, 60611, USA
e Department of Family Science, School of Public Health, University of Maryland, 4200 Valley Drive, Suite 1142, College Park, MD, 20742, USA

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ABSTRACT

Background: Sexual and gender minority (SGM) young persons are experiencing compounding effects of COVID-19 due to unique social inequalities and existent mental health and substance use challenges. Given that 41% of all young persons are enrolled in universities, and the increased vulnerabilities faced by SGM young persons during the pandemic, it is imperative to understand the effects of alcohol use on mental health among SGM university students amid COVID-19. This study aims to examine the associations between changes in alcohol use since the start of COVID-19 and mental distress among SGM university students in the U.S., and to explore sex-stratified differences.

Methods: A nonprobability cross-sectional sample of 509 SGM university students (M age = 22.04 years, SD = 3.99) were retrospectively surveyed online between May-August 2020 and asked if their alcohol use had changed since the start of COVID-19. Statistical analyses explored the association between changes in alcohol use since the start of COVID-19 and mental distress.

Results: Average psychological distress (M = 27.79, SD = 7.82) was relatively high as per existing research and established clinical cutoff scores. Roughly 32% had increased alcohol use since the start of COVID-19. Subsequently, greater alcohol use (p < .05) since the start of COVID-19 was associated with higher psychological distress among SGM university students, and among females but not males assigned at birth.

Conclusions: Higher education, medical, and behavioral health professionals should consider how to adapt their practice to address alcohol use and psychological burdens among SGM university students (especially females) who are facing health inequities during and beyond COVID-19, requiring SGM-affirmative care.

1. Introduction

Sexual and gender minority (SGM) young persons are experiencing compounding effects of the COVID-19 pandemic due to unique social inequalities (e.g., lack of access to affirmative medical and mental health care, economic precarity) (McKay et al., 2020; Salerno et al., 2020a; Veldhuis, 2020), and existent risks for mental health and substance use challenges, including alcohol use disorders and anxiety and depression (Ploderl and Tremblay, 2015; Rice et al., 2019; Russell and Fish, 2016). Research has begun to document how SGM mental health inequities are exacerbated by the COVID-19 pandemic (Flentje et al., 2020; Gonzales et al., 2020; Salerno et al., 2020b). Further, substance use disorders are emerging and accelerating as a result of the pandemic (Dubey et al., 2020), especially among women (Rodriguez et al., 2020), university students (Lechner et al., 2020), and racial and ethnic minority and young persons (Czeisler et al., 2020). Among young adults between the ages of 18–24 specifically, 27.4% reported starting or increasing substance use to cope with COVID-19 pandemic-related stress or emotions (Czeisler et al., 2020). Still, research has yet to reveal how alcohol use specifically is associated with mental health among SGM populations as
a result of COVID-19. Given that 41% of all young persons are currently enrolled in United States (U.S.) universities (Espinosa et al., 2019), and the increased mental health vulnerabilities of SGM young persons amid the pandemic (Flentje et al., 2020; Gonzales et al., 2020; Salerno et al., 2020b), it is imperative to understand how alcohol use affects mental health among SGM university students in the context of COVID-19. Considering that sex-differences have been identified in alcohol use disorders among SGM persons (Fish and Exten, 2020) and in the context of COVID-19 (Rodriguez et al., 2020), there is further a need to investigate stratified alcohol use to mental health pathways among SGM university students assigned male and assigned female at birth. Despite these needs, SGM persons and university students have received limited public health attention in this time, which is a missed public health opportunity given that these are priority populations for alcohol and substance use prevention and mental health support.

The current study aims to cross-sectionally and retrospectively examine the association between changes in alcohol use since the start of COVID-19 and psychological distress among SGM young persons in U.S. universities. We hypothesized that increased alcohol use would be associated with greater psychological distress among SGM university students (i.e., primary hypothesis). We further hypothesized that the relationship would be stronger for SGM university students assigned female compared to assigned male at birth (i.e., secondary hypothesis).

Findings from our study extend current research on the associations between mental health and COVID-19 among SGM persons and may inform medical and behavioral health and higher education research, practice, and policy to mitigate the mental health and alcohol use consequences of the pandemic on SGM young persons and university students.

2. Methods

A nonprobability cross-sectional online survey was conducted in the U.S. among SGM university students between May 27th and August 14th, 2020 to retrospectively explore the association between alcohol use and mental distress on SGM university students since the start of COVID-19. Participants were recruited via email campaign at various universities across the U.S. and social media. Participants had to self-identify as full-time university students in the U.S., as SGM persons, and be least 18 years old to be eligible to participate. Survey duration was approximately 20–25 min and participants were offered the chance to enter into a drawing for a $50 Amazon.com gift card upon survey completion. Institutional review board approval and participant informed consent were obtained prior to commencing data collection. The current analytic sample includes a total of n = 509 SGM university students.

2.1. Measures

The previously validated Kessler-10 (K10) was used to measure current psychological distress using a 5-point Likert-type scale from (1) none to (5) all of the time (Kessler et al., 2002). A composite score was calculated using all 10-items (range = 10–50, α = .907). Participants were asked to indicate if their alcohol use had changed (response options: less use, no change, more use, have not used in the past year, and never used before) since the start of COVID-19. The alcohol use variable was recoded for statistical significance testing (0 = no increase, 1 = increase).

2.2. Analytic strategy

Data analyses were conducted using IBM SPSS Statistics, Version 27. Following descriptive statistics, multivariate linear regression models were conducted to examine the association between changes in alcohol use since the start of COVID-19 on current psychological distress among SGM young persons in universities (i.e., primary hypothesis). To examine differences in effects by sex assigned at birth, stratified regression models were conducted (i.e., secondary hypothesis). Models were adjusted for tobacco, cannabis, and illicit substance use, nativity, age, sex, gender identity, sexuality, parental financial dependence, educational program type, ethnicity, race, and outness; these covariates were selected because they were hypothesized to be related to the independent variable (alcohol use) and/or the dependent variable (psychological distress) (VanderWeele, 2019) as per existing epidemiological and SGM health research.

3. Results

Sample demographics are presented in Table 1. Average psychological distress (M = 27.79, SD = 7.82) was relatively high as per the established K10 clinical cutoff scores (Kessler et al., 2002) and existing research (Dunbar et al., 2017). Since the start of COVID-19, approximately 32% of the sample reported increased alcohol use.

3.1. Primary hypothesis

Regression models are presented in Table 2. Model 1 showed that compared to SGM university students that did not report such increases, those who did report increased alcohol use since the start of COVID-19 were significantly more likely to report greater psychological distress (B = 1.957, p = .009); significant covariates included tobacco use (1) vs. non-use (0) (B = 3.626, p = .005), other race (1) vs. white (0) (B = 3.236, p = .023), undergrad (1) vs. grad (0) (B = 2.548, p = .009), queer gender (1) vs. cisgender (0) (B = 2.713, p = .022), transgender (1) vs. cisgender (0) (B = 3.892, p = .002), and female sex (1) vs. male sex (0) (B = 2.859, p = .001).

3.2. Secondary hypothesis

The regression model stratified by sex assigned at birth (Model 2) showed that the effect of increased alcohol use on psychological distress since the start of COVID-19 was non-significant for assigned males (B = 3.182, p = .123). Conversely, the effect of increased alcohol use on psychological distress since the start of COVID-19 was significant for assigned females (B = 2.026, p = .013); significant covariates included foreign-born (1) vs. U.S. born (0) (B = 3.119, p = .044), undergrad (1) vs. grad (0) (B = 2.713, p = .012), queer gender (1) vs. cisgender (0) (B = 3.080, p = .018), and transgender (1) vs. cisgender (0) (B = 2.867, p = .048).

4. Discussion

This study aimed to explore whether changes in alcohol use since the start of COVID-19 were associated with greater psychological distress among SGM university students, and to examine for differences in these associations by sex assigned at birth. Our primary and secondary hypotheses were supported; study results suggested that increased alcohol use was associated with greater psychological distress among SGM students (i.e., primary hypothesis), and stratified models suggested that the pathways were significant for SGM students assigned female at birth, but not among those assigned male at birth (i.e., secondary hypothesis). Our findings build upon emerging research and are among the first to highlight the potential link between increased alcohol use amid COVID-19 and psychological distress among SGM university students, and especially among SGM students assigned female at birth. Given our study results, medical and behavioral health providers and higher education stakeholders must act in order to mitigate the alcohol use and mental health ramifications faced by SGM young persons and university students during COVID-19.
existing substance use disorders (Dubey et al., 2020), it is critical to 2020b), which may lead to new substance use disorders and relapses of COVID-19 (Flentje et al., 2020; Gonzales et al., 2020; Salerno et al., 2020), facing elevated mental health and substance use challenges during 4.1. Public health implications

Considering that SGM young persons and university students are facing elevated mental health and substance use challenges during COVID-19 (Flentje et al., 2020; Gonzales et al., 2020; Salerno et al., 2020b), which may lead to new substance use disorders and relapses of existing substance use disorders (Dubey et al., 2020), it is critical to enhance provider training and expand implementation of

**Table 1** Sample sociodemographic characteristics among sexual and gender minority university students (n = 509).

| Characteristics                                      | n (%) |
|------------------------------------------------------|-------|
| **Sex assigned at birth**                             |       |
| Female                                               | 397 (78.3) |
| Male                                                 | 110 (21.7) |
| **Gender Identity**                                  |       |
| Cisgender                                             | 353 (69.3) |
| Transgender                                           | 45 (8.8) |
| Non-binary                                            | 62 (12.2) |
| Queer                                                | 49 (9.6) |
| **Sexual Orientation**                               |       |
| Bisexual                                             | 167 (32.8) |
| Gay/Lesbian                                          | 161 (31.6) |
| Queer                                                | 76 (14.9) |
| Another sexual identity                               | 105 (20.6) |
| **Age [M, (SD)]**                                    |       |
| [20.6] (3.99)                                        |       |
| **Hispanic or Latinx Ethnicity**                      |       |
| Yes                                                  | 76 (14.9) |
| No                                                   | 433 (75.1) |
| **Race**                                              |       |
| Asian                                                | 72 (14.1) |
| white                                                | 385 (75.6) |
| Black or African American                            | 52 (10.2) |
| Another non-white race                                | 37 (7.3) |
| **Nativity**                                          |       |
| United States-born                                    | 467 (92.1) |
| Foreign-born                                          | 40 (7.9) |
| **Parental Financial Dependence**                    |       |
| Yes                                                  | 426 (83.9) |
| No                                                   | 82 (16.1) |
| **Educational Program**                              |       |
| Undergraduate                                        | 358 (70.3) |
| Graduate                                             | 151 (29.7) |
| **Psychological Distress Composite[^a^]** [(M, SD)]  |       |
| 27.79 (7.82)                                         |       |
| **Alcohol Use**                                       |       |
| Decrease                                             | 126 (24.8) |
| No change                                            | 108 (21.2) |
| Increase                                              | 164 (32.2) |
| Never used before                                    | 88 (17.3) |
| Have not used in over a year                         | 23 (4.5) |
| **Tobacco Use**                                       |       |
| Decrease                                             | 25 (4.9) |
| No change                                            | 24 (4.7) |
| Increase                                              | 40 (7.9) |
| Never used before                                    | 327 (64.2) |
| Have not used in over a year                         | 93 (18.3) |
| **Cannabis Use**                                     |       |
| Decrease                                             | 73 (12.9) |
| No change                                            | 43 (7.6) |
| Increase                                              | 113 (22.2) |
| Never used before                                    | 197 (38.7) |
| Have not used in over a year                         | 83 (16.3) |
| **Illicit Substance Use**                            |       |
| Decrease                                             | 13 (2.6) |
| No change                                            | 23 (4.5) |
| Increase                                              | 22 (4.3) |
| Never used before                                    | 460 (90.6) |
| Have not used in over a year                         | 86 (16.9) |
| **Outness[^b^]** [(M, SD)]                           |       |
| 15.35 (4.70)                                         |       |

[^a^] Total percent in this category will not add up to 100, as participants were instructed to select all that apply.

[^b^] This category refers to current reported level during COVID-19 (past 30 days).

[^c^] Outness composite score ranged from 5 to 24.

**Table 2** Regression models testing associations between changes in alcohol use since COVID-19 and psychological distress among sexual and gender minority university students (n = 500).

| Variable                      | B     | 95% CI     | p  | r^2   |
|-------------------------------|-------|------------|----|-------|
| **Model 1: Overall Linear**   |       |            |    |       |
| Increased Alcohol Use[^c^]    | 1.957 | (.493, 3.422) | .009 | .111 |
| Tobacco Use                   | 3.626 | (1.120, 6.132) | .005 | .120 |
| Cannabis Use                  | .647  | (-1.051, 2.345) | .455 | .032 |
| Illicit Substance Use         | .478  | (-2.822, 3.779) | .776 | .012 |
| Age                           | .143  | (-.087, .373) | .224 | .052 |
| Race - Asian                  | -1.049| (-3.109, .317) | .317 | .042 |
| Race - Black                  | -.770 | (-3.020, 1.481) | .502 | .028 |
| Race - Other                  | 3.236 | (.458, 6.014) | .023 | .097 |
| Hispanic Ethnicity            | -.820 | (-2.859, .430) | .123 | .033 |
| Parental Financial Dependence | .949  | (-1.345, 3.242) | .417 | .034 |
| Nativity                      | -.413 | (-3.006, 2.180) | .754 | .013 |
| Outness                       | -.113 | (-2.611, 2.380) | .135 | .063 |
| Educational Program           | 2.548 | (1.637, 3.460) | .009 | .111 |
| Gay/Lesbian                   | .268  | (-1.467, 2.003) | .762 | .013 |
| Non-binary Gender             | 1.994 | (-1.157, 4.146) | .069 | .077 |
| Female Sex                    | 2.859 | (1.155, 4.563) | .001 | .140 |

**Model 2: Male Stratified**

| Variable                      | B     | 95% CI     | p  | r^2   |
|-------------------------------|-------|------------|----|-------|
| Increased Alcohol Use[^c^]    | 3.182 | (5.232, 14.863) | .123 | .142 |
| Tobacco Use                   | 8.185 | (1.634, 24.736) | .015 | .226 |
| Cannabis Use                  | -.896 | (-5.599, 3.808) | .706 | .034 |
| Illicit Substance Use         | 2.663 | (5.127, 10.454) | .499 | .062 |
| Age                           | .947  | (-.583, .777) | .882 | .014 |
| Race - Asian                  | -3.519| (13.861, 1.153) | .152 | .132 |
| Race - Black                  | -.599 | (-9.666, 4.068) | .834 | .019 |
| Race - Other                  | 3.932 | (1.948, 9.812) | .187 | .121 |
| Hispanic Ethnicity            | -1.564| (-6.248, 3.120) | .509 | .060 |
| Parental Financial Dependence | -2.086| (-6.874, 2.763) | .793 | .024 |
| Nativity                      | 4.685 | (-.870, 10.241) | .097 | .153 |
| Outness                       | -.196 | (-.591, .199) | .326 | .090 |
| Educational Program           | 1.358 | (3.644, 5.911) | .591 | .049 |
| Gay/Lesbian                   | -1.032| (5.696, 3.633) | .661 | .040 |
| Queer Sexual Orientation      | .852  | (-6.298, 8.001) | .813 | .022 |
| Queer Gender                  | .772  | (-5.208, 6.752) | .798 | .023 |
| Transgender                   | 6.330 | (1.557, 12.104) | .032 | .198 |
| Non-binary Gender             | 3.149 | (3.973, 10.270) | .382 | .080 |

(continued on next page)
SGM-affirmative mental health and substance use prevention practice to meet rising needs among SGM populations during and beyond COVID-19 (Phillips et al., 2020), including tele-medicine/therapy services (Salerno et al., 2020a). SGM-affirmative practice includes awareness of SGM-related stressors (e.g., SGM-identity family rejection and concealment) (Salerno et al., 2020a), intersectionality (i.e., multiple marginalized identities and associated challenges) (Wilson et al., 2019), and identity development (e.g., coming out) (Bishop et al., 2020) concerns. SGM-affirmative practice may increase engagement and retention of SGM clients in substance use and mental health care during the context of COVID-19 and beyond. Our study findings especially highlight the importance of SGM-affirmative practice approaches in the context of COVID-19 that elevate the needs of SGM college students assigned female at birth. Unfortunately, emerging research has found a severe dearth of SGM-affirmative mental health and substance use services in the U.S. (Williams and Fish, 2020). These findings emphasize the urgent need for competent mental health and substance use care in the time of COVID-19 and beyond, particularly at colleges and universities.

It is further essential to ensure that existing patient data collection procedures adequately capture the SGM identity information (e.g., sex assigned at birth, gender identity, sexuality) necessary to identify these high risk groups, and prompt the provision of substance use disorder prevention practices with SGM young persons during and following the pandemic (Phillips et al., 2020; Salerno et al., 2020b, 2020c). It is imperative for medical and mental health providers to implement consistent substance use screening of young SGM clients in order to increase diagnoses and treatment of substance use disorders among these populations. More broadly, medical and behavioral health providers need to consider how to best adapt their practice to address substance use and mental health burdens among young SGM persons (especially those assigned female at birth), who are facing health inequities during and beyond COVID-19 that require SGM-affirmative intervention.

Higher education institutions can further impact the prevention of alcohol (and other substance) use and mental health burdens among SGM university students by providing affirmative mental health, social, and community support resources (Gonzales et al., 2020; Salerno et al., 2020b). For example, universities can extend the capacity of existing SGM-affirmative campus mental health and alcohol use services, including professional individual and group treatment, and social support groups, with increased attention toward SGM college students assigned female at birth. Many universities implement alcohol use prevention campaigns across various departments (e.g., departments of residency, student services, student affairs, student health and counseling centers), which could benefit from SGM inclusivity and affirmation-focused adaptation. This could increase SGM student engagement in impactful alcohol use services and resources. Universities can also disseminate existing SGM-affirming mental health and substance use support resources (e.g., Trevor Project, National LGBT Help Center, Q Chat Space).

4.2. Limitations

This study used a non-probability sampling strategy, which limits our ability to generalize findings to broader populations of SGM university students. The study also used a retrospective cross-sectional data collection strategy, which limits inferences on causality and temporal ordering of focal variables; such limitations are important to consider in the context of intervention development. Additionally, the study is subject to recall bias due to required memories of past events, and social desirability bias, as alcohol use and mental health burden are subject to negative stigmatizing attitudes; results should be interpreted with caution. Although models were adjusted for various sociodemographic categories, small cell sample sizes impacted our ability to examine effects by more specific subgroups, such as those by race, ethnicity, and socioeconomic status. Given the disproportionate impact of COVID-19 on racial and ethnic minorities and other socially disadvantaged populations (Coextier et al., 2020), future researchers are urged to investigate the needs of SGM young persons situated at the intersections of multiple marginalized identities amid and beyond the pandemic. The current study also did not examine the impact of SGM-related stressors (e.g., family rejection, internalized homophobia) in alcohol use to psychological distress pathways. Considering that previous research has identified SGM stressors as impactful predictors of substance use among SGM youth populations (Goldbach et al., 2014), future research should investigate the impact of SGM-related stressors in the context of the COVID-19 pandemic to inform the development and adaptation of mental health and substance use services for SGM populations during this time. Lastly, students who were assigned female at birth accounted for a larger proportion of the sample compared to those assigned male at birth, which may have increased power to detect effects among assigned females relative to assigned males. Despite these limitations, this study provides important alcohol use, mental health, and higher education practice implications to consider in the context of COVID-19 and future societal-level crises related to the care of SGM young persons and students.

4.3. Conclusion

To our knowledge, our findings are among the first to reveal that increased alcohol use among SGM university students is associated with greater psychological distress in the context of COVID-19. Study findings emphasize the importance of culturally responsive mental health, alcohol use, and higher education practice and response to address the needs of SGM university students amid and beyond COVID-19.
Contributors

John P. Salerno: Responsible for study conceptualization, design, data collection, primary analysis, and preparation and revision of the manuscript. Cho-Hee Shrader: Responsible for reviewing and editing the manuscript. Angel B. Algarin: Responsible for reviewing and editing the manuscript. Ji-Young Lee: Responsible for reviewing and editing the manuscript. Jessica N. Fish: Provided supervision and advised study conceptualization, design, and data collection, and reviewed and edited the manuscript. All authors contributed to and have approved the final manuscript.

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Declaration of Competing Interest

Authors declare that they had no conflicts of interest.

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