Mental Health among LGBTQ Cannabis Users During the COVID-19 Pandemic: Analysis of the COVID-19 Cannabis Health Study

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Abstract

The purpose of this study is to compare the responses of LGBTQ cannabis consumers and their non-LGBTQ counterparts on anxiety, depression, substance use, and COVID-19 coping and stress during the pandemic. Data from an internet-survey of cannabis users during the COVID-19 pandemic were analyzed ($N = 2,319$). Approximately 18% of the sample identified as LGBTQ. Bivariate analyses were used to examine the relationship between LGBTQ identity and symptoms of anxiety and depression, substance use, and pandemic-related coping strategies and stressors. Logistic regression models were used to evaluate the association between pandemic stressors and coping strategies with LGBTQ identity, while adjusting for sex, age, and race and ethnicity. Differences in the proportion of medicinal cannabis use among LGBTQ respondents (74.6%) and non-LGBTQ respondents (75.3%) were insignificant. LGBTQ cannabis users were more likely to report COVID-19 related stressors and coping behaviors, including increased alcohol use. After adjustment for covariates, LGBTQ cannabis users were more likely to report symptoms of depression and anxiety than non-LGBTQ cannabis users. These results show that compared to their cisgender heterosexual counterparts, LGBTQ cannabis users are experiencing more problematic mental health outcomes during the COVID-19 pandemic.

Keywords

LGBTQ; Mental Health; Cannabis; COVID-19

The COVID-19 pandemic, caused by SARS-CoV-2, has directly impacted the lives of every person across the United States (U.S.). In the U.S., there are over 25 million cases, and more than 430,000 lives lost (CDC, 2021). The COVID-19 pandemic is also having a serious negative mental health impact on the U.S. population (Amsalem et al., 2020; Czeisler et

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al., 2020; Liu et al., 2020; Torales et al., 2020). Further, social distancing and isolation related measures, such as quarantining, have been reported to have severe psychological distress and substance use ramifications (Brooks et al., 2020). Existing research indicates that the COVID-19 pandemic has led to increases in alcohol use, anxiety, and depression among the general population (Chodkiewicz et al., 2020; Czeisler et al., 2020; Liu et al., 2020; Vindegaard & Benros, 2020). Identifying sub-populations at-risk for mental health burdens during the time of COVID-19 is vital to mitigate the severity and impact of the pandemic. For example, there is a dearth of information on the potential mental health burdens and related coping mechanisms during the COVID-19 pandemic among lesbian, gay, bisexual, transgender, and queer or questioning (LGBTQ) persons (Phillips et al., 2020; Salerno, Devadas, et al., 2020; Salerno, Williams, et al., 2020). This is concerning given that it is well documented that LGBTQ populations face disproportionate mental health burden and outcomes in comparison to their heterosexual counterparts, including PTSD, anxiety, depression, suicidality, and other psychological distress (Ploderl & Tremblay, 2015). The mental health impact of COVID-19 on LGBTQ persons may be complicated by their existing risks for mental health concerns. Indeed, preliminary evidence demonstrates that LGBTQ persons are facing mental health inequities during the COVID-19 pandemic, including elevated rates of depression, loneliness, and anxiety (Flentje et al., 2020; Gonzales et al., 2020; Salerno, Pease, et al., 2020; Veldhuis, 2020) during this time. However, public health surveillance efforts on the impacts of COVID-19 have not focused on LGBTQ populations (Phillips et al., 2020; Salerno, Devadas, et al., 2020; Salerno, Williams, et al., 2020). Given the burden of mental health symptoms among LGBTQ populations both generally and during the pandemic, it is imperative to study the mental health of LGBTQ persons in the context of the COVID-19 pandemic. Medicinal and recreational (adult-use) cannabis consumers are another example of a sub-population that is potentially vulnerable to negative mental health impacts of COVID-19; an earlier analysis of non-LGBTQ respondents using the COVID-19 Cannabis Health Study (N=1,202; 82.5% non-Hispanic White, mean age 47.2 years) found that 76.7% of cannabis users were living with depression or anxiety (Vidot, Islam, et al., 2020). Given that the majority of cannabis consumers reported pre-existing mental health-related chronic conditions, it is important to examine the added affliction of mental health of the COVID-19 pandemic among LGBTQ cannabis users. Although existing research has demonstrated the negative mental health and non-cannabis substance use impacts of COVID-19 on the general population (Czeisler et al., 2020; Liu et al., 2020), little is known about the potential mental health burdens and related coping mechanisms during the COVID-19 pandemic among cannabis consumers overall and LGBTQ cannabis users in particular.

This study uses U.S. data from the COVID-19 cannabis health study administered to adult cannabis users to assess cannabis-related behaviors, route, frequency, and the impact of the pandemic on mental health. The aim of this study is to compare the responses of LGBTQ participants and non-LGBTQ participants on measures of anxiety, depression, substance use, and items related to coping and stress during the pandemic. It is hypothesized that LGBTQ respondents will demonstrate higher proportions of mental health symptoms related to anxiety and depression, and higher rates of polysubstance substance use compared to non-LGBTQ participants. A second aim was to examine whether coping strategies differed

between LGBTQ participants meeting and not meeting the clinical criteria for depression and anxiety. It was hypothesized that coping strategies for those meeting and not meeting the clinical criteria for depression and anxiety would differ among LGBTQ participants. This study extends existing findings documenting the mental health and substance use impacts of the COVID-19 pandemic on the general U.S. population and LGBTQ persons by analyzing an important subpopulation of LGBTQ cannabis users. Our findings may influence research, policy, and practice to mitigate the secondary mental health and substance use outcomes associated with the COVID-19 pandemic on LGBTQ cannabis users.

Methods

Study Overview

Cross-sectional data are from the ongoing internet-based COVID-19 Cannabis Health Study (Vidot, Islam, et al., 2020), designed by a multidisciplinary group of researchers to examine the physical and mental health of cannabis users during COVID-19. The goal of the current analyses is to examine the mental health burdens and related coping mechanism of LGBTQ cannabis users amid the COVID-19 pandemic. Study data are being collected and managed using the REDCap electronic data capturing software hosted at the University of Miami. This study was approved by the University of Miami Institutional Review Board. Informed consent was obtained electronically from all participants before data collection.

Participants and Recruitment

Recruitment began when the anonymous electronic survey became public on March 21, 2020. A flyer with the survey link and study details was distributed widely via social media platforms including Twitter, LinkedIn, Facebook, and Instagram. Emails with the study flyer were sent to research list serves, community advisory boards, and clinic representatives to post and/or share with their networks digitally. Eligibility criteria to participate in the study included: (a) being 18 years of age or older, and (b) self-reporting cannabis use in the past year. Data presented are from those with completed demographic information and responses to the COVID-19 Cannabis Health Questionnaire (Vidot, Messiah, et al., 2020) between March 21, 2020 and June 3rd, 2020 ($N = 2,319$). On average, surveys took approximately 10 minutes to complete. A comparison of the number of completed surveys divided by the total number of clicks on the survey yielded a response rate of 83.3%.

Table 1 summarizes socio-demographic variables among LGBTQ respondents ($N = 422$) and non-LGBTQ respondents ($N = 1,897$). Overall, LGBTQ respondents were younger ($M = 39.1$ years) and more likely to be women (57.7%) compared to their non-LGBTQ counterparts ($M = 45.5$ years; 42.4% women). Overall, 75.0% of respondents were non-Hispanic White; however, a larger proportion of LGBTQ respondents identified as a racial or ethnic minority (19.9%) compared to non-LGBTQ respondents (16.6%, $p = .01$). No significant differences were identified between LGBTQ and non-LGBTQ respondents concerning education (88.3% had at least some college education), living outside of the US (16.7%), being employed for wages (38.0%) or having health insurance (89.7%). The data revealed that 75.2% of respondents reported using cannabis for medicinal purposes. There

were no differences in the proportion of medicinal cannabis users among LGBTQ adults (74.6%) compared to non-LGBTQ counterparts (75.3%; $p = .77$).

Measures

Demographic items such as race and ethnicity, educational background, and employment status were self-reported. LGBTQ status, a binary variable, was defined based on data collected on two variables: one measured gender identity (response options included "Female", "Male", "Transgender" and "Other") and the second sexual orientation (response options included: "Straight or heterosexual", "Gay", "Lesbian", "Bisexual", "Queer", "Pansexual", "Asexual", "Unsure/questioning/exploring", or "Other"). All respondents that either selected "transgender" or "other" on the gender identity question or who selected anything other than "Straight or heterosexual" on the sexual orientation question were coded as LGBTQ. Additionally, a series of items related to substance use were administered to evaluate use of tobacco, alcohol, opioids, methamphetamine, cocaine, and psilocybin. These items gauged whether there were self-reported changes in use concurrent to the pandemic using a categorical variable (e.g., more use since COVID-19, less use since COVID-19, no change since COVID-19, or never used). To gauge the impact of COVID-19 on cannabis use specifically, the COVID-19 Cannabis Health Questionnaire (CCHQ) was administered. The CCHQ is a 25-item questionnaire designed to measure chronic disease comorbidities, medical cannabis use patterns, health risk behavior, and the effects of the COVID-19 pandemic on cannabis use (Vidot, Islam, et al., 2020; Vidot, Messiah, et al., 2020). Item-level responses on the CCHQ are categorical and do not sum to total or scale scores and no evidence of validity and reliability is available. Validated scales were administered to measure depression (Center for Epidemiologic Studies Depression Scale or CES-D) (Radloff, 1977) and anxiety (General Anxiety Disorder-7 or GAD-7) (Spitzer et al., 2006). In the current sample, Cronbach's alpha was determined to be $\alpha = .868$ and $\alpha = .920$ for the CES-D and the GAD-7, respectively. For both the CES-D and the GAS-7, responses were dichotomized to represent clinically relevant levels of depression and anxiety, respectively. This was done to facilitate interpretability of the results allowing a comparison of respondents likely to meet criteria for depression and anxiety compared to those not experiencing these conditions. Finally, the Pandemic Stress Index (PSI) (Harkness et al., 2020) was administered to measure preventive behaviors, the impact on day-to-day life, and experiences and coping behaviors due to the COVID-19 pandemic. Like the CCHQ, responses on the PSI were examined at the item-level (e.g., categorical responses) and are not combined to yield total or scale scores.

Data Analysis

Descriptive statistics were used to examine range, frequencies, mean, and median across variables of interest. Means are presented for continuous variables and prevalence estimates for categorical variables. Chi-squared tests of independence were used for comparing LGBTQ to non-LGBTQ respondents on coping strategies and experiences due to the COVID-19 pandemic and for examining self-reported change in substance use for each substance independently. Next, multivariable analyses using logistic regression were carried out to estimate adjusted odds ratios with 95% confidence intervals to evaluate the association of experiences during the COVID-19 pandemic and coping strategies with

LGBTQ identity among cannabis users after adjusting for gender, age, income, and race/ ethnicity. Additionally, the association between depression and anxiety (10 score of CES-D or GAD-7 scale) with LGBTQ identity was evaluated using logistic regression models after adjusting for age, gender, and race/ethnicity. Based on the exploratory nature of this analysis, an adjustment for multiple comparisons was not included (Althouse, 2016; Rothman, 1990). Statistical analyses were performed using a complete-case analytic approach using Stata 15.0. The Type I error was maintained at 5%.

Results

Substance Use

Since COVID-19 was declared a pandemic, 44.2% of LGBTQ respondents reported an increase in the amount of cannabis used compared to 38.6% of non-LGBTQ respondents ($p = .03$). Overall, since the start of the pandemic, LGBTQ respondents were more likely to report using more alcohol ($p < .01$) in addition to cannabis compared to non-LGBTQ respondents ($p < .01$) (Supplementary Figure 1). However, self-reported patterns of co-use of tobacco ($p = .309$), opioid ($p = .534$), methamphetamine ($p = .461$), cocaine ($p = .274$), or psilocybin ($p = .169$) did not differ between LGBTQ respondents and their non-LGBTQ counterparts.

Depression and Anxiety among LGBTQ Respondents during the COVID-19 pandemic

Overall, the average CES-D depression score was 11.5 among the entire sample, with 55% of respondents endorsing symptoms associated with clinically relevant depression (e.g., a score of 10 or above using the CES-D). LGBTQ respondents had a higher average CES-D score (13.4) compared to non-LGBTQ persons (11.0) (Supplementary Figure 2). The average GAD-7 anxiety score was 8.5 among the entire sample, with approximately 40% of participants displaying a score consistent with clinically relevant anxiety (e.g., a score of 10 or above). Similar to what was observed with depression, LGBTQ respondents had a higher GAD-7 score (9.9) compared to non-LGBTQ persons (8.2) (Supplementary Figure 2). After adjustment for sex, gender, and race/ethnicity, the odds of clinically relevant depression (CES-D score 10) was 31% higher among LGBTQ respondents than non-LGBTQ respondents (Figure 1). Additionally, the odds of clinically relevant anxiety (GAD-7 score 10) was 36% higher among LGBTQ respondents than non-LGBTQ respondents (Figure 1).

Coping Strategies and Stressful Experiences among LGBTQ Respondents during the COVID-19 Pandemic

LGBTQ respondents were more likely to report that they were not coping with the COVID-19 pandemic compared to non-LGBTQ respondents ($p = .02$) (Supplementary Table 1). Additionally, LGBTQ respondents were more likely to report using the following coping strategies: over-eating or stress eating ($p < .01$), getting more sleep ($p < .01$), and talking to a health care professional ($p = .02$) than non-LGBTQ respondents (Supplementary Table 1). No significant differences were found between LGBTQ and non-LGBTQ respondents on using meditation/mindfulness, healthier eating habits, physical activity, getting less sleep, working more, talking to family or friends, stopping cannabis use, using more cannabis, or any changes in sexual activity.

Additionally, stressful experiences during the COVID-19 pandemic were evaluated revealing that LGBTQ persons were more likely to worry about international friends, family, partners ($p < .01$), experience stigma or discrimination related to COVID-19 ($p < .01$), and report a change in sexual activity ($p < .01$) compared to non-LGBTQ persons. Additionally, LGBTQ respondents were more likely to receive social/emotional ($p < .01$) and financial support ($p = .01$) than non-LGBTQ persons (Supplementary Table 1). No significant differences were found on worrying about local friends, family, and partners, personal financial loss, frustration or boredom, not having enough basic supplies, feeling that they contributed to the greater good by preventing COVID-19, or confusion about what COVID-19 is.

Coping Strategies and Stressful Experiences Among Depressed and Anxious LGBTQ Respondents

Figure 2 illustrates associations between coping strategies during the COVID-19 pandemic between LGBTQ and non-LGBTQ persons with elevated depression and anxiety. After adjusting for age, race/ethnicity, and sex, LGBTQ respondents with elevated depression (aOR: 1.62, 95% CI: 1.19–2.21) and with elevated anxiety (aOR: 1.64, 95% CI: 1.13–2.34) were more likely to report sleeping more as a coping mechanism during the COVID-19 pandemic compared to non-LGBTQ respondents with elevated depression or anxiety. Significant differences were not found with regard to overeating or stress eating, not coping, talking to a health care professional, or having less sex.

LGBTQ respondents with elevated depression were more likely to report experiencing stigma or discrimination related to COVID-19 (aOR:1.46, 95% CI: 1.01–2.11), worrying about international friends, family, and partners (aOR; 1.44, 95% CI: 1.06–1.95), getting more sleep (aOR: 1.56, 95% CI: 1.13–2.16), and a change in sexual activity (aOR: 1.51, 95% CI: 1.09–2.10) compared to non-LGBTQ respondents with elevated depression (Figure 3). LGBTQ respondents with elevated anxiety were more likely to report experiencing stigma or discrimination related to COVID-19 (aOR: 1.73, 95% CI: 1.14–2.62), and getting more sleep (aOR: 1.56, 95% CI: 1.07–2.28) compared to non-LGBTQ respondents with elevated anxiety. However, they were equally likely to worry about international friends, family, or partners and to report a change in sexual activity. Finally, both LGBTQ respondents with elevated depression and those with elevated anxiety were more likely to report feeling they were contributing to the greater good by preventing COVID-19 through their actions compared to non-LGBTQ with these conditions (Figure 3).

Discussion

This study is the first to examine the mental health of cannabis users across the U.S. during the COVID-19 pandemic with a focus on comparing LGBTQ respondents to non-LGBTQ respondents. Results indicate that LGBTQ cannabis users have increased the amount of cannabis used since COVID-19 was declared a pandemic. LGBTQ cannabis users were more likely to report COVID-19 related stressors and coping behaviors, such as increased alcohol use, which could be detrimental to their mental health compared to their heterosexual, cisgender counterparts. After adjustment for covariates, LGBTQ cannabis

users were more likely to report symptoms of depression and anxiety compared to non-LGBTQ cannabis users.

Key Findings

While other studies have reported increased alcohol use, depression, and anxiety since the pandemic (Chodkiewicz et al., 2020; Vindegaard & Benros, 2020), this is the first study to elucidate mental health disparities between LGBTQ and non-LGBTQ cannabis users specifically. Notably, LGBTQ cannabis users with elevated depression and anxiety were more likely to report COVID-19 related pandemic stressors, such as stigma or discrimination related to COVID-19 symptoms, worrying about the health of international friends, family, or partners, sleeping more, and changes to their sexual activity compared to their non-LGBTQ counterparts with elevated depression and anxiety. LGBTQ cannabis users (regardless of depression and anxiety) were also more likely to report not coping or unhealthy coping during the pandemic compared to non-LGBTQ cannabis users. Results suggest that LGBTQ cannabis users are using unhealthy coping behaviors and alcohol while struggling with their mental health compared to non-LGBTQ cannabis users. This conclusion is not surprising given that the majority of cannabis consumers in this study reported pre-existing mental health-related chronic conditions (Vidot, Islam, et al., 2020). Unfortunately, increased substance use and mental health burden during COVID-19 could lead to increases in suicide rates (Sher, 2020), especially among LGBTQ persons with pre-existing risks (McNeil et al., 2017; Yıldız, 2018), which could be exacerbated in the current pandemic context. Overall, the results of this study align with existing research, which documents the mental health and substance use disparities faced by LGBTQ persons in comparison to non-LGBTQ persons within and outside of the pandemic context (Ploderl & Tremblay, 2015; Veldhuis, 2020), as well as LGBTQ-related inequities within the COVID-19 literature (Flentje et al., 2020; Gonzales et al., 2020; Salerno, Pease, et al., 2020). Although past research has demonstrated LGBTQ persons' risk for co-occurring mental and behavioral health concerns, our study is among the first to demonstrate such relationships at the intersections of LGBTQ identities and cannabis use in the pandemic context.

Limitations

Several limitations should be considered when interpreting the results of this analysis. Due to anonymity, there may be repeat responses; however, this is unlikely to have occurred as participants were not provided with any monetary or other incentives. Further, to mitigate the potential for repeat responses, study staff reviewed for possible duplicates via birthdates and zip codes provided. There were no duplicates found based on these variables. The electronic nature of the survey provides an opportunity for selection bias, particularly by the exclusion of those without internet access or who the survey dissemination procedures failed to reach. Furthermore, all data were self-reported which provides the opportunity for both recall bias and social desirability bias resulting in the potential impact on calculated prevalence estimates. Finally, causation and temporality cannot be established due to the cross-sectional study design.

Despite limitations, the study has notable strengths. First, the present study is first to provide insights into LGBTQ adult cannabis users as a specific vulnerable population amidst the

COVID-19 pandemic. Second, the anonymous nature of the survey may have increased participation from LGBTQ cannabis user participants, who may not be as likely to engage in research. The anonymity of the survey may have also resulted in participants providing more accurate responses to sensitive topics related to cannabis use and the COVID-19 pandemic.

Implications for Practice

Findings have COVID-19 relevant implications for practitioners serving LGBTQ clients across multiple sectors. Given the elevated odds of depression, anxiety, and alcohol use among LGBTQ persons during the COVID-19 pandemic in this sample, medical providers serving LGBTQ persons (especially cannabis users) have a responsibility and opportunity to regularly screen for mental health and substance use issues, refer high-risk LGBTQ persons for mental health and/or substance use treatment, and provide necessary follow-up to ensure proper linkages to care. It is imperative for mental health and substance use providers serving LGBTQ persons to work collaboratively with medical providers to ensure that LGBTQ persons are receiving equitable high-quality care during the COVID-19 pandemic. It is also highly important that referrals are made to service providers that practice culturally sensitive and affirmative care with LGBTQ persons.

Implications for Policy

Findings also have implications for policy-level considerations in the context of the COVID-19 pandemic, cannabis, and LGBTQ population health. First, it is imperative for public health stakeholders responsible for COVID-19 crisis response efforts to shift their attention to populations being disproportionately impacted by the pandemic, including LGBTQ populations, whose mental health may be facing disparate threats in comparison to their heterosexual, cisgender counterparts. Public health policy stakeholders are implored to address COVID-19 health and mental health disparities by implementing public health crisis response frameworks that seek to address structural and social inequalities faced by historically marginalized populations, including intersectionality (Bowleg, 2012) and health equity/life course perspective (Braveman, 2014) paradigms. Without thoughtful integration of such approaches to public health intervention and policy, historically and consistently oppressed populations, such as racial, ethnic, sexual, and gender minorities will continue to experience health disparities in comparison to heterosexual, cisgender, and white populations.

Implications for Future Research

Given that LGBTQ cannabis users face a disproportionately high burden of mental health and substance use disparities in comparison to their heterosexual, cisgender counterparts, it is essential to explore the mechanisms and causal pathways that lead to such burdens. For instance, young LGBTQ persons may be confined to their parents' homes and facing risks for experiencing family-related rejection, victimization, and concealment of their identities (Fish et al., 2020; Gonzales et al., 2020; Salerno, Pease, et al., 2020); such minority stressors may be linked with mental health burdens among LGBTQ young persons amid the COVID-19 pandemic (Salerno, Devadas, et al., 2020). Further, LGBTQ young persons may be lacking access to needed university and K-12 school resources, such as mental health services, gender and sexuality alliances, and other affirming supports that typically protect

against negative mental health outcomes (Russell & Fish, 2016; Salerno, Devadas, et al., 2020; Salerno, Pease, et al., 2020). Similarly, elderly LGBTQ persons could be facing a lack of access to needed social services and community-based resources amidst the pandemic (Whittington et al., 2020). It is critical for public health researchers and surveillance systems to implement minority stress frameworks (Meyer, 2003) in future COVID-19 research to understand how such factors influence mental health outcomes among LGBTQ persons during the pandemic to inform equitable public health response policies and interventions.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

References

Althouse AD (2016). Adjust for multiple comparisons? It's not that simple. The Annals of Thoracic Surgery, 101(5), 1644–1645. [PubMed: 27106412]

Amsalem D, Dixon LB, & Neria Y (2020). The Coronavirus Disease 2019 (COVID-19) Outbreak and Mental Health: Current Risks and Recommended Actions. JAMA Psychiatry. 10.1001/jamapsychiatry.2020.1730

Bowleg L (2012). The problem with the phrase women and minorities: Intersectionality—An important theoretical framework for public health. American Journal of Public Health, 102(7), 1267–1273. 10.2105/AJPH.2012.300750 [PubMed: 22594719]

Braveman P (2014). What is health equity: And how does a life-course approach take us further toward it? Maternal and Child Health Journal, 18(2), 366–372. [PubMed: 23397099]

Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, & Rubin GJ (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. The Lancet, 395(10227), 912–920. 10.1016/S0140-6736(20)30460-8

CDC. (2021). Cases in the U.S., Coronavirus Disease 2019 (COVID-19). Centers for Disease Control and Prevention.

Chodkiewicz J, Talarowska M, Miniszewska J, Nawrocka N, & Bilinski P (2020). Alcohol Consumption Reported during the COVID-19 Pandemic: The Initial Stage. International Journal of Environmental Research and Public Health, 17(13), 4677. [PubMed: 32610613]

Czeisler ME, Lane RI, Petrosky E, Wiley JF, Christensen A, Njai R, Weaver MD, Robbins R, Facer-Childs ER, Barger LK, Czeisler CA, Howard ME, & Rajaratnam SM (2020). Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 Pandemic—United States, June 24–30, 2020. MMWR Morb Mortal Wkly Rep, 69(32), 1049–1057. 10.15585/mmwr.mm6932a1 [PubMed: 32790653]

Fish JN, McInroy LB, Paceley M, Williams N, Henderson S, Levine D, & Edsall R (2020). "I'm kinda stuck at home with unsupportive parents right now": LGBTQ Youths' Experiences with COVID-19 and the Importance of Online Support. Journal of Adolescent Health. 10.1016/j.jadohealth.2020.06.002

Flentje A, Obedin-Maliver J, Lubensky ME, Dastur Z, Neilands T, & Lunn MR (2020). Depression and Anxiety Changes Among Sexual and Gender Minority People Coinciding with Onset of COVID-19 Pandemic. Journal of General Internal Medicine, 1–3. 10.1007/s11606-020-05970-4

Gonzales G, Loret de Mola E, Gavulic KA, McKay T, & Purcell C (2020). Mental Health Needs Among Lesbian, Gay, Bisexual, and Transgender College Students During the COVID-19 Pandemic. Journal of Adolescent Health. 10.1016/j.jadohealth.2020.08.006

Harkness A, Behar-Zusman V, & Safren SA (2020). Understanding the Impact of COVID-19 on Latino Sexual Minority Men in a US HIV Hot Spot. AIDS and Behavior, 1–7. [PubMed: 30903450]

Liu CH, Zhang E, Wong GTF, Hyun S, & Hahm H. "Chris." (2020). Factors associated with depression, anxiety, and PTSD symptomatology during the COVID-19 pandemic: Clinical implications for U.S. young adult mental health. Psychiatry Research, 290, 113172. 10.1016/j.psychres.2020.113172 [PubMed: 32512357]

McNeil J, Ellis SJ, & Eccles FJR (2017). Suicide in trans populations: A systematic review of prevalence and correlates. In Psychology of Sexual Orientation and Gender Diversity (Vol. 4, Issue 3, pp. 341–353). Educational Publishing Foundation. 10.1037/sgd0000235

Meyer IH (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. Psychological Bulletin, 129(5), 674–697. 10.1037/0033-2909.129.5.674 [PubMed: 12956539]

Phillips G, Felt D, Ruprecht MM, Wang X, Xu J, Pérez-Bill E, Bagnarol RM, Roth J, Curry CW, & Beach LB (2020). Addressing the Disproportionate Impacts of the COVID-19 Pandemic on Sexual and Gender Minority Populations in the United States: Actions Toward Equity. LGBT Health. 10.1089/lgbt.2020.0187

Ploderl M, & Tremblay P (2015). Mental health of sexual minorities. A systematic review. International Review of Psychiatry, 27(5), 367–385. 10.3109/09540261.2015.1083949 [PubMed: 26552495]

Radloff LS (1977). The CES-D Scale: A Self-Report Depression Scale for Research in the General Population. Applied Psychological Measurement, 1(3), 385–401. 10.1177/014662167700100306

Rothman KJ (1990). No adjustments are needed for multiple comparisons. Epidemiology, 43–46. [PubMed: 2081237]

Russell ST, & Fish JN (2016). Mental Health in Lesbian, Gay, Bisexual, and Transgender (LGBT) Youth. Annual Review of Clinical Psychology, 12, 465–487. 10.1146/annurev-clinpsy-021815-093153

Salerno JP, Devadas J, Pease M, Nketia B, & Fish JN (2020). Sexual and Gender Minority Stress Amid the COVID-19 Pandemic: Implications for LGBTQ Young Persons' Mental Health and Wellbeing (in press). Public Health Reports, 135(6). 10.1177/0033354920954511

Salerno JP, Pease M, Devadas J, Nketia B, & Fish JN (2020). COVID-19-Related Stress Among LGBTQ+ University Students: Results of a U.S. National Survey. University of Maryland Prevention Research Center. 10.13016/zug9-xtmi

Salerno JP, Williams ND, & Gattamorta KA (2020). LGBTQ Populations: Psychologically Vulnerable Communities in the COVID-19 Pandemic. Psychological Trauma: Theory, Research, Practice, and Policy, 12(S1), S239–S242. 10.1037/tra0000837 [PubMed: 32551761]

Sher L (2020). The impact of the COVID-19 pandemic on suicide rates. QJM: An International Journal of Medicine. 10.1093/qjmed/hcaa202

Spitzer RL, Kroenke K, Williams JBW, & Lowe B (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. Archives of Internal Medicine, 166(10), 1092–1097. 10.1001/archinte.166.10.1092 [PubMed: 16717171]

Torales J, O'Higgins M, Castaldelli-Maia JM, & Ventriglio A (2020). The outbreak of COVID-19 coronavirus and its impact on global mental health. International Journal of Social Psychiatry, 0020764020915212.

Veldhuis CB (2020). The COVID-19 and Wellbeing Study, Comparing COVID-19-Related Mental Health Among LGBTQ+ and Heterosexual Individuals. Columbia University.

Vidot DC, Islam JY, Camacho-Rivera M, Harrell MB, Rao DR, Chavez JV, Ochoa LG, Hlaing WM, Weiner M, & Messiah SE (2020). The COVID-19 cannabis health study: Results from an epidemiologic assessment of adults who use cannabis for medicinal reasons in the United States. Journal of Addictive Diseases, 1–11. 10.1080/10550887.2020.1811455

Vidot DC, Messiah SE, & Gattamorta KA (2020). COVID-19 Cannabis Health Questionnaire (CCHQ). El Centro Measures Library. https://elcentro.sonhs.miami.edu/research/measures-library/cchq/index.html

Vindegaard N, & Benros ME (2020). COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. Brain, Behavior, and Immunity.

Whittington C, Hadfield K, & Calderon C (2020). The lives & Livelihoods of Many in the LGBTQ Community are at Risk Amidst COVID-19 Crisis. Human Rights Campaign.

Yıldız E (2018). Suicide in sexual minority populations: A systematic review of evidence-based studies. Archives of Psychiatric Nursing, 32(4), 650–659. 10.1016/j.apnu.2018.03.003 [PubMed: 30029759]

Public Significance Statement:

LGBTQ cannabis users are experiencing more problematic mental health outcomes compared to their cisgender heterosexual counterparts during the COVID-19 pandemic. This is the first study to show that the risk for co-occurring mental and behavioral health concerns at the intersection of LGBTQ identity and cannabis use in the context of the pandemic.

Associations of Depression (CES-D Scale) and Anxiety (GAD-7 Scale) with LGBTQ among adult cannabis users
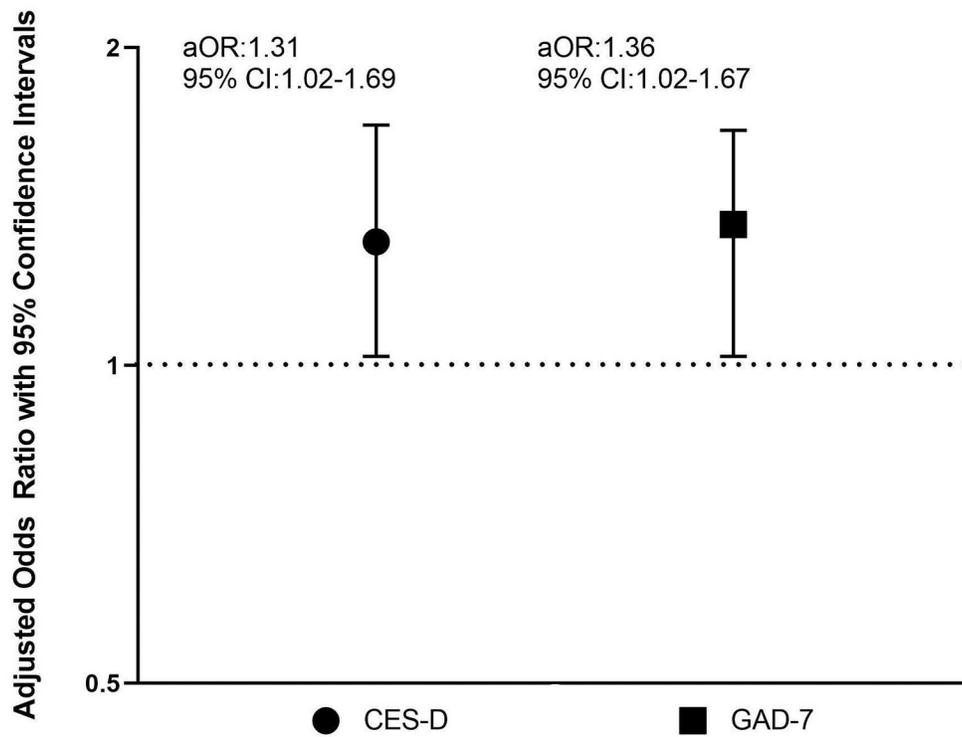

Figure 1.
Adjusted Odds Ratio Summarized on the Logarithmic Scale. Models adjusted for: Age, race/ethnicity, gender.
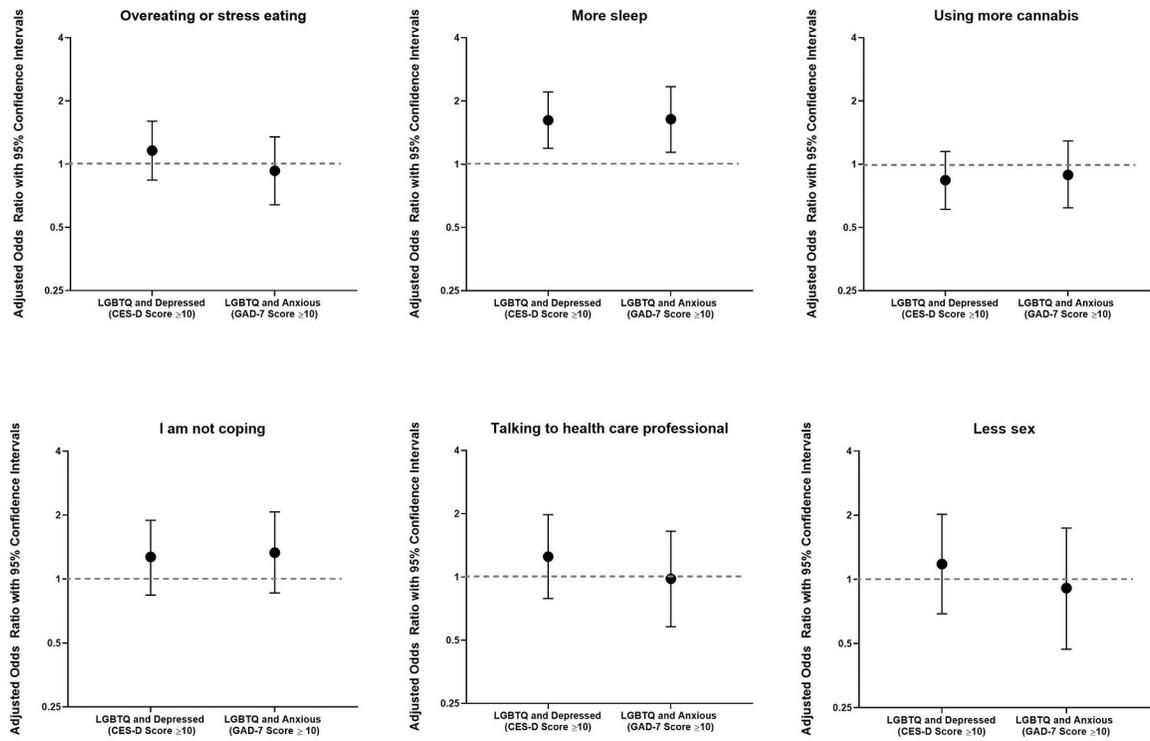
Figure 2.
Adjusted Odds Ratio Summarized on the Logarithmic Scale. Models adjusted for: Age, race/ethnicity, gender.
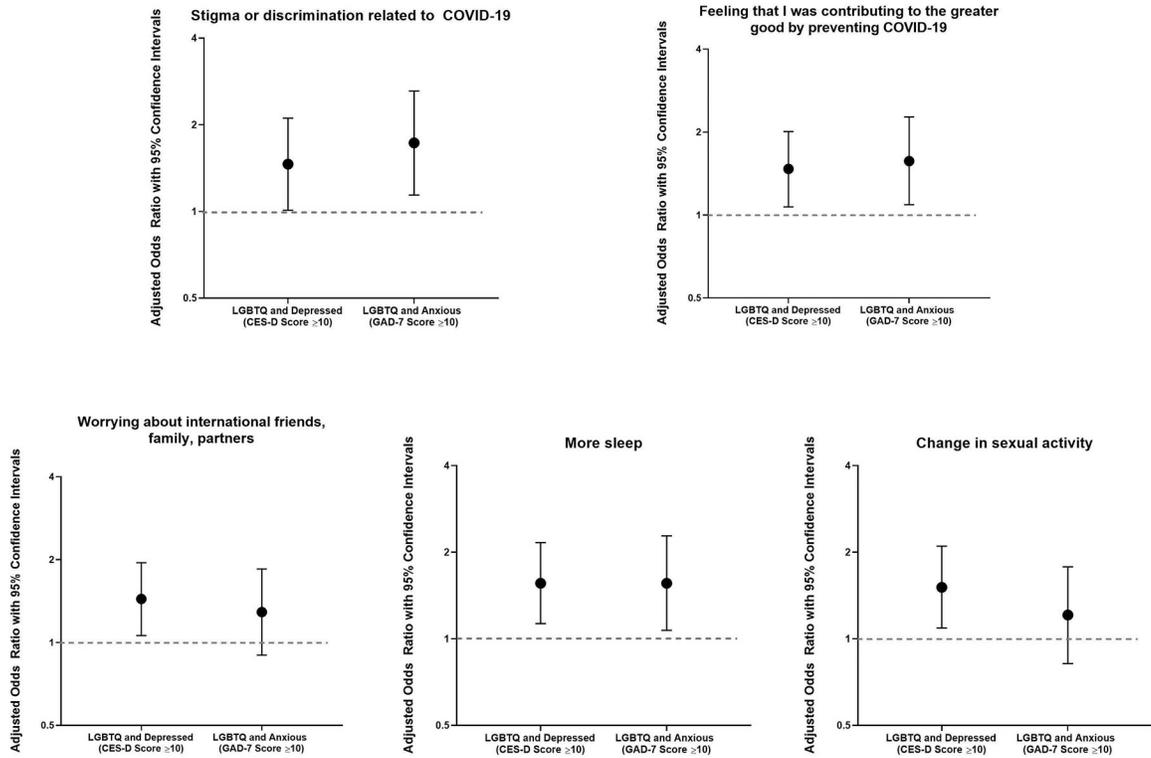
Figure 3.
Adjusted Odds Ratio Summarized on the Logarithmic Scale. Models adjusted for: Age, race/ethnicity, gender.

Table 1.

Socio-demographic Variables Among LGBTQ and Non-LGBTQ Respondents

	Total (n = 2319)		Non-LGBTQ (n = 1897)		LGBTQ (n = 422)		*p*
	n	**%**	**n**	**%**	**n**	**%**	
Age (Mean, SD)	44.3, 15.5		45.5, 15.2		39.1, 15.8		
Gender							<.001
Women	1045	45.2	805	42.4	240	57.7	
Men	1243	53.7	1092	57.6	151	36.3	
Other	11	0.5	0	0	11	2.6	
Transgender	14	0.6	0	0	14	3.4	
Race and Ethnicity							.011
NH-White	1740	75	1449	76.4	291	68.9	
NH-Black	99	4.3	80	4.2	19	4.5	
Hispanic	301	12.9	236	12.4	65	15.4	
Other	163	7	121	6.4	42	9.9	
Educational Categories							.633
High school or less	271	11.7	225	11.9	46	11.0	
Bachelor's degree or some college	1598	69	1300	68.6	298	71.0	
Master's degree or higher	447	19.3	371	19.6	76	18.1	
Lives Outside United States	387	16.7	324	17.1	63	14.9	.284
Employed for Wages	881	38	726	38.3	155	36.7	.555
Uninsured	127	10.3	102	10.3	25	10.4	.229
Medicinal Cannabis Users	1744	75.2	1429	75.3	315	74.6	.768

Note. Missing Values: Age (n=14); Gender(n=6); Education(n=3); Race/Ethnicity(n=16)