



Published in final edited form as:

Drug Alcohol Depend. 2020 January 01; 206: 107755. doi:10.1016/j.drugalcdep.2019.107755.

Sexual minority substance use disparities: Bisexual women at elevated risk relative to other sexual minority groups

Megan S. Schuler¹, Rebecca L. Collins²

¹RAND Corporation, 20 Park Plaza #920, Boston MA USA 02216

²RAND Corporation, 1776 Main Street, Santa Monica CA 90401

Abstract

Background: Prior studies characterizing sexual minority substance use disparities have primarily compared lesbian/gay and bisexual individuals, respectively or in combination, to heterosexual individuals. In light of emerging evidence that bisexual individuals may have particularly elevated substance use risk, we examine differences in recent substance use between bisexual and lesbian/gay individuals using national survey data.

Methods: Data on 126,463 adults (including 8,241 LGB adults) were from the 2015-2017 National Survey on Drug Use and Health. Substance use outcomes included binge drinking, cigarette smoking, cigar smoking, marijuana use, illicit drug use, opioid misuse, alcohol use disorder, nicotine dependence, and substance use disorder. Logistic regression was used to estimate sexual identity- and gender-specific odds ratios, controlling for demographic characteristics. Of particular interest were estimates comparing bisexual and lesbian/gay individuals of the same gender.

Results: Both male and female sexual minority adults had significantly elevated rates of substance use compared to heterosexual adults. Furthermore, relative to lesbian/gay women, bisexual women had significantly elevated odds of binge drinking (aOR=1.29), marijuana use (aOR=1.42), illicit drug use (aOR=1.55), opioid misuse (aOR=1.53) and alcohol use disorder (aOR=1.48). Relative to gay men, bisexual men had significantly elevated cigar use (aOR=1.64).

Conclusions: Bisexual women were at significantly greater risk for multiple substance use behaviors relative to lesbian/gay women. We did not observe any substance use behaviors for which bisexual individuals had significantly lower risk than their lesbian/gay peers. These disparities may be explained, in part, by unique risk factors for substance use experienced by bisexual individuals, particularly bisexual women.

Corresponding Author: Megan Schuler, 20 Park Plaza #920, Boston MA 02216, mschuler@rand.org, (p) 617-338-2059 x8602.

Contributors: MSS conceptualized the study, performed analyses and led manuscript writing. RLC contributed to interpretation of results and manuscript writing. All authors have read and approved the final version of the manuscript.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Conflict of Interest: No conflict declared

Keywords

sexual minorities; bisexual; gay; lesbian; disparities; substance use; tobacco; National Survey on Drug Use and Health

1. Introduction

Relative to heterosexual adults, many substance use behaviors are elevated among sexual minority (e.g., individuals who identify as lesbian, gay or bisexual) adults. National surveys find that sexual minority (SM) adults are more likely to smoke cigarettes and meet criteria for nicotine dependence (Cochran et al., 2013; Gonzales and Henning-Smith, 2017; Gonzales et al., 2016; Operario et al., 2015) as well as to engage in binge drinking and meet criteria for alcohol use disorder (Allen and Mowbray, 2016; Boyd et al., 2019b; McCabe et al., 2019; Schuler et al., 2018) compared to heterosexual peers of the same gender. SM adults also exhibit disparities with respect to marijuana use (Boyd et al., 2019a; Demant et al., 2017; Schuler et al., 2019b), illicit drug use (Demant et al., 2017; Operario et al., 2015; Schuler et al., 2018) opioid misuse (Duncan et al., 2019; Schuler et al., 2019a) and substance use disorder (Evans-Polce et al., 2019; Kerridge et al., 2017; Lee et al., 2016).

Sexual minority substance use disparities are often attributed to minority stress, namely the stigma, prejudice and discrimination uniquely experienced by those in a marginalized social group (Meyer, 2003). Minority stress may result from interpersonal experiences of rejection or discrimination, internalized stigma, or structural factors such as institutional policies and laws (Hatzenbuehler and Link, 2014). This chronic social stress is associated with elevated risk for behavioral health issues among sexual minority individuals compared to heterosexuals, including substance use (Boyle et al., 2017; Goldbach et al., 2014; Lee et al., 2016; Mereish et al., 2017), psychological distress and depression (Feinstein and Dyar, 2017; Hatzenbuehler, 2017; Hatzenbuehler et al., 2010; Lehavot and Simoni, 2011).

Recent studies provide emerging evidence of important heterogeneity in substance use disparities among sexual minorities. In prior work with the National Survey on Drug Use and Health, we found that bisexual women exhibited significant disparities (relative to heterosexual women) across a greater number of substance use behaviors than did lesbian/gay women (Schuler et al., 2018; Schuler et al., 2019b). Similarly, data from the Global Drug Survey (including over 12,000 SM respondents) showed that both bisexual men and women exhibited significant disparities (with respect to same-gender heterosexuals) on 12 of the 13 substances surveyed, whereas lesbian/gay women exhibited disparities on 6 substances and gay men exhibited disparities on 5 substances (Demant et al., 2017). A study of Youth Risk Behavior Survey data from teens across 14 U.S. jurisdictions found that lesbian/gay youth only differed from heterosexual peers with respect to past-month drinking, whereas bisexual youth differed with respect to lifetime drinking, past-month drinking, past-month binge drinking and age of alcohol initiation (Talley et al., 2014). Collectively, these findings suggest that bisexual individuals may have differential risk for substance use relative to lesbian/gay peers.

Few studies to date have formally compared substance use among bisexual individuals with their lesbian/gay counterparts. A study of the 2009-2010 National Adult Tobacco Survey found that bisexual women had significantly higher rates of current smoking than lesbian/gay women, although this comparison did not adjust for sociodemographic differences between groups (Fallin et al., 2015). Our prior study of National Survey on Drug Use and Health data indicated that bisexual women have significantly higher rates of opioid use disorder, opioid misuse and lifetime heroin use compared to lesbian/gay women (Schuler et al., 2019a). In contrast, findings from the 2012–2013 National Epidemiologic Survey on Alcohol and Related Conditions-III indicated that bisexual men and women were not at elevated risk for alcohol use disorder, nicotine dependence or substance use disorder relative to gay men and lesbian/gay women (Kerridge et al., 2017). To date, rates of tobacco, alcohol, marijuana and illicit drug use have not been compared between bisexual individuals and their lesbian/gay counterparts using nationally-representative data and adjusting for sociodemographic differences.

The objective of this study is to test for differences in the prevalence of a wide range of substance use behaviors and disorders across bisexual and lesbian/gay individuals of the same gender using a nationally representative sample of adults from the 2015-2017 National Survey on Drug Use and Health (NSDUH). While estimates for the prevalence of bisexuality vary across studies, recent data suggest that over 70% of sexual minority individuals age 18–44 in the U.S. identify as bisexual (Copen et al., 2016). Characterizing potential substance use disparities uniquely experienced by bisexual individuals is imperative to addressing SM disparities.

2. Methods

2.1 Study Population

Data were from the 2015, 2016 and 2017 NSDUH, an annual nationally-representative survey on drug use among the civilian, non-institutionalized US population ages 12 and older. Data were collected using computer-assisted interviewing to facilitate accurate reporting of sensitive behaviors. The sample size for the public use NSDUH data was 57,146 individuals in 2015 (70% response rate), 56,897 individuals in 2016 (68% response rate) and 56,276 individuals in 2017 (67% response rate). All survey respondents gave written informed consent and were compensated \$30. Of the 170,319 total respondents across 2015-2017, 41,479 individuals ages 12-17 were excluded as NSDUH does not ask minors about sexual identity. An additional 1,501 individuals who did not respond to the sexual identity question and 776 individuals who responded “don’t know” were excluded. The final sample size was 126,463 adults identifying as “heterosexual”, “lesbian or gay” or “bisexual.” This study was deemed exempt from review by RAND’s IRB.

2.2 Measures

Sexual identity was assessed by an item that asked, “Which one of the following do you consider yourself to be?” with response choices of “Heterosexual, that is, straight,” “Lesbian or gay,” “Bisexual,” and “Don’t know.”

Substance use behaviors of interest were: past-month binge alcohol use (1+ occurrence of 4+ drinks/day for women or 5+ drinks/day for men in the past 30 days), past-month cigarette use (1+ cigarette in the past 30 days), past-year cigar use (1+ cigar in the past 12 months), past-year marijuana use (1+ episode of marijuana use in the past 12 months), past-year opioid misuse (1+ episode of either heroin use or prescription opioid pain reliever misuse in the past 12 months), and past-year illicit drug use (excluding marijuana use) (Center for Behavioral Health Statistics and Quality, 2017). We used the NSDUH-derived illicit drug use variable; individuals were coded positive if they reported any use of an illicit drug (cocaine, heroin, hallucinogen, inhalant, or methamphetamine) or misuse of a prescription drug (opioid pain relievers, stimulants, sedatives or tranquilizers) in the past 12 months. The NSDUH operationalized prescription drug misuse as any use of a prescription drug “in a way a doctor did not direct you to use it.”

The NSDUH assesses DSM-IV abuse and dependence criteria for an extensive list of substances and provides derived indicator variables for past-year alcohol use disorder (AUD) and past-year substance use disorder (SUD) (Center for Behavioral Health Statistics and Quality, 2017). Individuals were coded positive for past-year AUD if they met either abuse criteria (1+ abuse symptom) or dependence criteria (3+ dependence symptoms) for alcohol in the past 12 months. Individuals were coded positive for past-year SUD if they met either abuse (1+ abuse symptom) or dependence criteria (3+ dependence symptoms) for at least one of the following: marijuana, an illicit drug (heroin, cocaine, methamphetamine, hallucinogens or inhalants) or a prescription drug (opioid pain relievers, stimulants, sedatives or tranquilizers) in the past 12 months. Past-month nicotine dependence was measured by the Fagerström Test for Nicotine Dependence item assessing whether the first cigarette smoked was within 30 minutes of waking up.

Demographics included: age (categorized as: 18, 19, 20, 21, 22-23, 24-25, 26-29, 30-34, 35-49, 50-64 or 65+ years old), gender (male or female), race/ethnicity (White, Black, Hispanic, Asian or Other), education level (less than high school, high school, some college/2 year college degree or 4 year college degree), employment (full-time, part-time, student, unemployed or other), household income (less than \$20,000, \$20,000-\$49,999, \$50,000-\$74,999 or \$75,000+), health insurance (insured or uninsured), marital status (married, widowed, divorced/separated or never married), living with children under age 18 (yes or no), and urbanicity (large metro area, small metro area or non-metro area).

2.3 Analysis

We calculated weighted prevalence rates, stratified by sexual identity and gender, for substance use behaviors and disorders. For each outcome, separate logistic regression models that included sexual identity and gender indicators and their interactions were used to estimate sexual identity- and gender-specific odds ratios (ORs). Of primary interest were OR estimates comparing bisexual individuals and lesbian/gay individuals of the same gender. To assist with interpretation we also report ORs comparing lesbian/gay individuals and bisexual individuals, respectively, to same-gender heterosexual peers. For each model, the Sidak correction was used to account for multiple comparisons across sexual identity

subgroups. Analyses were conducted in Stata version 15.1 using the *svy* suite to account for NSDUH survey design.

3. Results

3.1 Descriptive characteristics of study population

Our sample included 1,410 gay men, 1,221 bisexual men, 1,321 lesbian/gay (L/G) women and 4,289 bisexual women as well as 56,184 heterosexual men and 62,038 heterosexual women (Table 1). Sexual minority adults, particularly bisexual women, were younger on average than heterosexual adults. Racial/ethnic composition across sexual identity subgroups was similar. While gay men and L/G women had higher education levels than heterosexual peers, bisexual men and women had lower education levels. Sexual minority men and women were less likely to be married than heterosexual men and women. Compared to same-gender heterosexual peers, gay men, bisexual men and L/G women were less likely to be living with children under 18, whereas bisexual women were more likely.

3.2 Substance use behaviors and disorders: Bisexual women vs. lesbian/gay women

Rates of marijuana use, non-marijuana illicit drug use, opioid misuse and AUD were significantly higher among bisexual women compared to L/G women (marijuana aOR=1.42 [1.09-1.85]; illicit drug aOR=1.55 [1.16-2.07]; opioid aOR=1.53 [1.05-2.22]; AUD aOR=1.48 [1.03-2.12]) and both bisexual and L/G women exhibited disparities on these measures relative to heterosexual women (Table 2). Binge drinking was also significantly higher among bisexual women relative to L/G women (aOR=1.29 [1.02-1.63]); bisexual women additionally exhibited disparities relative to heterosexual women, unlike L/G women (Table 2). Cigarette smoking, cigar use, nicotine dependence and SUD were elevated among both bisexual and L/G women relative to heterosexual women, yet the magnitude of these disparities did not significantly differ between bisexual and L/G women.

3.3 Substance use behaviors and disorders: Bisexual men vs. gay men

Bisexual men had significantly elevated past-year cigar use relative to gay men (aOR=1.64 [1.11-2.43]), although neither gay nor bisexual men were at higher risk for cigar use compared to heterosexual men (Table 3). Marijuana use and non-marijuana illicit drug use did not significantly differ between bisexual and gay men, although both were elevated among bisexual and gay men relative to heterosexual men. No significant differences were observed between gay and bisexual men with respect to cigarette smoking, nicotine dependence, AUD and SUD, although gay men exhibited disparities on these measures relative to heterosexual men, unlike bisexual men. Finally, rates of binge drinking and opioid misuse did not differ significantly between bisexual and gay men and neither bisexual nor gay men exhibited disparities relative to heterosexual men on these measures.

4. Discussion

This novel study uses nationally-representative data to examine sexual minority substance use disparities, with a particular focus on the relative prevalence of substance use behaviors and disorders among bisexual adults compared to lesbian/gay adults. Accounting for

demographic differences, our results indicate that bisexual women have significantly higher rates, relative to L/G women, of multiple substance use behaviors (binge drinking, marijuana use, illicit drug use and opioid misuse) as well as alcohol use disorder. In contrast, relative to gay men, bisexual men reported significantly elevated use on just one measure, cigar use. Across men and women, there were no substance use behaviors or disorders for which bisexual individuals had significantly lower risk than their lesbian/gay peers. As we discuss below, the observed differences may, in part, be explained by bisexual-specific risk factors for substance use. In particular, the unique risk observed among bisexual women may be attributable to bisexual-specific risk factors that are specific to or more prevalent among women than men, as well as potential stronger associations between risk factors and substance use among women than men.

While the main contribution of this analyses is the examination of bisexual adults relative to L/G adults, we also replicate prior results demonstrating disparities in substance use among sexual minority adults compared to heterosexual adults. Consistent with prior work highlighting notable disparities among sexual minority women, we find that, relative to heterosexual women, bisexual and L/G women had higher prevalences of measures of alcohol use (Drabble et al., 2018; McCabe et al., 2019; Operario et al., 2015; Talley et al., 2019), tobacco use (Hoffman et al., 2018; Jamal et al., 2018; Johnson et al., 2016; McCabe et al., 2018; Wheldon et al., 2018), marijuana use (Demant et al., 2017; Feinstein et al., 2019; Talley et al., 2019), and illicit drug use, including opioid misuse (Capistrant and Nakash, 2019; Duncan et al., 2019; Operario et al., 2015). Our findings also indicated that, relative to heterosexual men, gay men exhibited disparities on measures of alcohol use, tobacco use, marijuana use, and illicit drug use (Gonzales et al., 2016; Hoffman et al., 2018; McCabe et al., 2018; Wheldon et al., 2018) and bisexual men had elevated rates of marijuana use and illicit drug use (Demant et al., 2017; Feinstein et al., 2019). The consistency of our results with respect to prior findings regarding LGB disparities bolsters confidence in the general replicability of our findings overall, and serves to underscore notable heterogeneity in LGB substance use disparities both by gender and by specific substances.

Just as LGB disparities relative to heterosexuals have been shown to be more pronounced among women, our results indicate that differences between bisexual and gay/lesbian individuals are also more pronounced among women. Among men, the singular difference observed was a higher prevalence of cigar use among bisexual men than gay men; however, no disparity was observed between bisexual and heterosexual men -- rather, this difference was driven by markedly lower rates of cigar use among gay men relative to both heterosexual and bisexual men. In contrast, bisexual women had significantly higher rates than L/G women of binge drinking, AUD, marijuana use, illicit drug use and opioid misuse, indicating that bisexual women systematically experience greater risk for multiple forms of substance use. While numerous prior studies have documented a greater number of substance use disparities among bisexual women than among L/G women (relative to heterosexual women), few studies have conducted head-to-head comparisons among sexual minority women. Our findings are consistent with a limited number of prior studies examining within-LGB differences that have also found evidence that bisexual women are at

elevated risk of substance use above and beyond L/G women (Fallin et al., 2015; Kerr et al., 2015; Schuler et al., 2019a).

Notably, the primary substance for which bisexual women did not differ from L/G women was tobacco – no differences were observed for cigarette smoking, cigar use or nicotine dependence. While it is not fully clear why bisexual women would exhibit elevated risk of alcohol, marijuana, and illicit drug use – but not tobacco use – relative to L/G women, our findings again highlight important variation in disparities by substance. Emerging evidence suggests that bisexual and L/G women may differ in terms of motivations for, expectations of, and perceived norms regarding alcohol, tobacco and other substance use (Boyle et al., 2017; Praeger et al., 2019; Talley et al., 2012); future work is needed to fully explicate the observed differences among sexual minority women.

Potential contributing factors to the elevated substance use risk observed among bisexual women include both the cultural invisibility of bisexuality as well as stigma and negative stereotypes associated with bisexuality (i.e., “biphobia”) (Zivony and Saguy, 2018). Bisexuality challenges the widely-held binary model of sexual orientation, namely that individuals are either attracted to individuals of the same gender or opposite gender. The dominance of this binary model contributes to the relative invisibility of bisexuality in contemporary culture, a social stressor uniquely experienced by bisexual individuals (Taylor, 2018). The dearth of bisexual-specific resources, even through LGBT-focused organizations, both reflects and contributes to lower visibility of the bisexual community and as well as lower levels of community connectedness among bisexual individuals (Bostwick and Dodge, 2019; Hequembourg and Brallier, 2009). Furthermore, heterosexual individuals, as well as gay men and L/G women, often hold negative stereotypes towards bisexual individuals, including that they are confused or lying about their sexual identity (Feinstein and Dyar, 2017; Taylor, 2018). Anti-bisexual stigma and internalized anti-bisexual stigma are associated with substance use, as well as other negative health outcomes, among samples of bisexual individuals (Balsam and Mohr, 2007; Feinstein and Dyar, 2017; Katz-Wise et al., 2017). Furthermore, bisexual invisibility and biphobia may contribute to mental distress and mental health problems (Friedman et al., 2014; Katz-Wise et al., 2017), which have been linked to substance use. Prior studies have found bisexual women are more likely to meet criteria for post-traumatic stress disorder relative to both heterosexual and L/G women (Kerridge et al., 2017) and bisexual women and men are at increased risk for anxiety, depression and suicidality (Ross et al., 2018; Salway et al., 2019) relative to heterosexual and lesbian/gay peers. Additional research is needed in order to better understand how biphobia may differentially impact bisexual men and women as well as whether biphobia and bisexual-specific stigma is more strongly associated with substance use for bisexual women than bisexual men.

The uniquely high rates of sexual violence among bisexual women may be another contributing factor to their elevated substance use risk. Data from the 2015 and 2017 Youth Risk Behavior Surveys indicate that female bisexual youth report higher rates of sexual dating violence and forced sexual intercourse, as well as school-based and electronic bullying, compared to their lesbian/gay female counterparts; similar differences were not observed between male bisexual and gay youth (Johns et al., 2018). Survey of adults

similarly find that bisexual women report higher rates of interpersonal violence and sexual assault compared to both heterosexual and L/G women (Hughes et al., 2010; Turell et al., 2018). Stereotypes that bisexual individuals are hypersexual, promiscuous or inherently non-monogamous (Doan Van et al., 2019; Yost and Thomas, 2012; Zivony and Saguy, 2018) may contribute to sexual coercion of bisexual individuals (Kelley et al., 2018; Li et al., 2013). Experiencing interpersonal violence, sexual assault, or PTSD is associated with a higher risk for substance use in the general population (Ullman et al., 2018; Ullman et al., 2013). Qualitative work indicates that bisexual women may use alcohol as a coping mechanism in response to feeling pressured to engage in sex, including sex with multiple partners (Taggart et al., 2019) and that SM women are more likely to report substance use as a coping strategy for sexual victimization (Lopez and Yeater, 2018).

Reducing substance use disparities among SM individuals necessitates understanding the heterogeneity in substance use behaviors and risk factors among the SM community. By several estimates, bisexual individuals now comprise over 70% of sexual minority Americans aged 18–44 (Copen et al., 2016). While biphobia and negative stereotypes associated with bisexuality have shared roots in homophobia, they are distinct phenomena that represent unique social stressors for bisexual individuals (Flanders et al., 2019). Thus, reducing minority stress among bisexual individuals will require specific efforts to counter biphobia as well as broader efforts to combat homophobia and SM discrimination.

Limitations

Measures of sexual identity and substance use are self-reported; measurement error may be present due to social desirability or recall bias. The NSDUH does not assess vaping / e-cigarette use. We are not estimating the “causal effect” of sexual identity; we acknowledge that some covariates we adjust for may be mediators in the relationship between sexual identity and substance use or have reciprocal associations with substance use. We are only able to examine differences across sexual identity groups as assessed in the NSDUH, and thus cannot characterize potential disparities among those with alternative identities. As NSDUH does not assess gender identity, we are unable to additionally examine disparities among gender minority (e.g., transgender) adults.

5. Conclusion

Our results provide new insight into LGB substance use disparities by demonstrating that bisexual women have particularly elevated substance compared to other sexual minority subgroups. We find that rates of multiple substance use behaviors (binge drinking, marijuana use, illicit drug use and opioid misuse) as well as AUD were significantly higher among bisexual women compared to L/G women. Reducing LGB substance use disparities necessitates understanding the heterogeneity in substance use behaviors and risk factors among the sexual minority community. In addition to examining disparities relative to heterosexuals, it is important that future studies also assess intragroup differences among sexual minorities. Additional research is needed examining differential risk factors and mechanisms across sexual minority subgroups that lead to the observed heterogeneity in substance use among LGB individuals.

Acknowledgments

Conflict of interest statement: MSS and RLC were supported by award R01MH104381 from the National Institute of Mental Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of NIMH, the NIH or the US Government. The sponsor did not have any role in study design; collection, analysis, and interpretation of data; writing the report; or the decision to submit the report for publication.

Financial disclosure: No financial disclosures were reported by the authors of this paper.

Role of funding source: This work was funded by awards R01MH104381. The content is solely the responsibility of the authors and does not necessarily represent the official views of NIMH, the NIH or the US Government.

REFERENCES

- Allen JL, Mowbray O, 2016 Sexual orientation, treatment utilization, and barriers for alcohol related problems: Findings from a nationally representative sample. *Drug Alcohol Depend.* 161, 323–330. [PubMed: 26936411]
- Balsam KF, Mohr JJ, 2007 Adaptation to sexual orientation stigma: A comparison of bisexual and lesbian/gay adults. *J. Couns. Psychol* 54(3), 306–319.
- Bostwick WB, Dodge B, 2019 Introduction to the special section on bisexual health: Can you see us now? *Arch. Sex. Behav* 48(1), 79–87. [PubMed: 30535566]
- Boyd CJ, Veliz PT, McCabe SE, 2019a Severity of DSM-5 cannabis use disorders in a nationally representative sample of sexual minorities. *Subst. Abus.*, 1–5.
- Boyd CJ, Veliz PT, Stephenson R, Hughes TL, McCabe SE, 2019b Severity of alcohol, tobacco, and drug use disorders among sexual minority individuals and their “not sure” counterparts. *LGBT Health* 6(1), 15–22. [PubMed: 30638419]
- Boyle SC, LaBrie JW, Costine LD, Witkovic YD, 2017 “It’s how we deal”: Perceptions of LGB peers’ use of alcohol and other drugs to cope and sexual minority adults’ own coping motivated substance use following the pulse nightclub shooting. *Addict. Behav* 65, 51–55. [PubMed: 27728830]
- Capistrant BD, Nakash O, 2019 Lesbian, gay, and bisexual adults have higher prevalence of illicit opioid use than heterosexual adults: Evidence from the national survey on drug use and health, 2015–2017. *LGBT Health* 6(6), 326–330. [PubMed: 31503524]
- Center for Behavioral Health Statistics and Quality, 2017 2016 national survey on drug use and health public use file codebook. Substance Abuse and Mental Health Services Administration, Rockville, MD.
- Cochran SD, Bandiera FC, Mays VM, 2013 Sexual orientation-related differences in tobacco use and secondhand smoke exposure among US adults aged 20 to 59 years: 2003–2010 National Health and Nutrition Examination Surveys. *Am. J. Public Health* 103(10), 1837–1844. [PubMed: 23948019]
- Copen CE, Chandra A, Febo-Vazquez I, 2016 Sexual behavior, sexual attraction, and sexual orientation among adults aged 18–44 in the United States: Data from the 2011–2013 national survey of family growth. *Natl Health Stat Report* 88(1–14).
- Demant D, Hides L, Kavanagh DJ, White KM, Winstock AR, Ferris J, 2017 Differences in substance use between sexual orientations in a multi-country sample: Findings from the Global Drug Survey 2015. *J Public Health (Oxf)* 39(3), 532–541. [PubMed: 27519959]
- Doan Van EE, Mereish EH, Woulfe JM, Katz-Wise SL, 2019 Perceived discrimination, coping mechanisms, and effects on health in bisexual and other non-monosexual adults. *Arch. Sex. Behav* 48(1), 159–174. [PubMed: 30105618]
- Drabble LA, Trocki KF, Korcha RA, Klinger JL, Veldhuis CB, Hughes TL, 2018 Comparing substance use and mental health outcomes among sexual minority and heterosexual women in probability and non-probability samples. *Drug Alcohol Depend.* 185, 285–292. [PubMed: 29482053]
- Duncan DT, Zweig S, Hambrick HR, Palamar JJ, 2019 Sexual orientation disparities in prescription opioid misuse among U.S. Adults. *Am. J. Prev. Med* 56(1), 17–26. [PubMed: 30467089]

- Evans-Polce R, Veliz P, Boyd C, Hughes T, McCabe S, 2019 Associations between sexual orientation discrimination and substance use disorders: Differences by age in US adults. *Soc. Psychiatry Psychiatr. Epidemiol*
- Fallin A, Goodin A, Lee YO, Bennett K, 2015 Smoking characteristics among lesbian, gay, and bisexual adults. *Prev. Med* 74, 123–130. [PubMed: 25485860]
- Feinstein BA, Dyar C, 2017 Bisexuality, minority stress, and health. *Curr Sex Health Rep* 9(1), 42–49. [PubMed: 28943815]
- Feinstein BA, Dyar C, Li DH, Whitton SW, Newcomb ME, Mustanski B, 2019 The longitudinal associations between outness and health outcomes among gay/lesbian versus bisexual emerging adults. *Arch. Sex. Behav* 48(4), 1111–1126. [PubMed: 30519838]
- Flanders CE, LeBreton M, Robinson M, 2019 Bisexual women’s experience of microaggressions and microaffirmations: A community-based, mixed-methods scale development project. *Arch. Sex. Behav* 48(1), 143–158. [PubMed: 29476410]
- Friedman MR, Dodge B, Schick V, Herbenick D, Hubach R, Bowling J, Goncalves G, Krier S, Reece M, 2014 From bias to bisexual health disparities: Attitudes toward bisexual men and women in the United States. *LGBT Health* 1(4), 309–318. [PubMed: 25568885]
- Goldbach JT, Tanner-Smith EE, Bagwell M, Dunlap S, 2014 Minority stress and substance use in sexual minority adolescents: a meta-analysis. *Prev. Sci* 15(3), 350–363. [PubMed: 23605479]
- Gonzales G, Henning-Smith C, 2017 Health disparities by sexual orientation: Results and implications from the behavioral risk factor surveillance system. *J. Community Health* 42(6), 1163–1172. [PubMed: 28466199]
- Gonzales G, Przedworski J, Henning-Smith C, 2016 Comparison of health and health risk factors between lesbian, gay, and bisexual adults and heterosexual adults in the United States: Results from the National Health Interview Survey. *JAMA Intern. Med* 176(9), 1344–1351. [PubMed: 27367843]
- Hatzenbuehler ML, 2017 The influence of state laws on the mental health of sexual minority youth. *Jama Pediatrics* 171(4), 322–324. [PubMed: 28241255]
- Hatzenbuehler ML, Link BG, 2014 Introduction to the special issue on structural stigma and health. *Soc. Sci. Med* 103, 1–6. [PubMed: 24445152]
- Hatzenbuehler ML, McLaughlin KA, Keyes KM, Hasin DS, 2010 The impact of institutional discrimination on psychiatric disorders in lesbian, gay, and bisexual populations: a prospective study. *Am. J. Public Health* 100(3), 452–459. [PubMed: 20075314]
- Hequembourg AL, Brallier SA, 2009 An exploration of sexual minority stress across the lines of gender and sexual identity. *J. Homosex* 56(3), 273–298. [PubMed: 19319738]
- Hoffman L, Delahanty J, Johnson SE, Zhao XQ, 2018 Sexual and gender minority cigarette smoking disparities: An analysis of 2016 behavioral risk factor surveillance system data. *Prev. Med* 113, 109–115. [PubMed: 29763683]
- Hughes T, McCabe SE, Wilsnack SC, West BT, Boyd CJ, 2010 Victimization and substance use disorders in a national sample of heterosexual and sexual minority women and men. *Addiction* 105(12), 2130–2140. [PubMed: 20840174]
- Jamal A, Phillips E, Gentzke AS, Homa DM, Babb SD, King BA, Neff LJ, 2018 Current cigarette smoking among adults - United States, 2016. *MMWR Morb. Mortal. Wkly. Rep* 67(2), 53–59. [PubMed: 29346338]
- Johns MM, Lowry R, Raspberry CN, Dunville R, Robin L, Pampati S, Stone DM, Mercer Kollar LM, 2018 Violence victimization, substance use, and suicide risk among sexual minority high school students - United States, 2015-2017. *MMWR Morb. Mortal. Wkly. Rep* 67(43), 1211–1215. [PubMed: 30383738]
- Johnson SE, Holder-Hayes E, Tessman GK, King BA, Alexander T, Zhao X, 2016 Tobacco product use among sexual minority adults: Findings from the 2012-2013 National Adult Tobacco Survey. *Am. J. Prev. Med* 50(4), e91–e100. [PubMed: 26526162]
- Katz-Wise SL, Mereish EH, Woulfe J, 2017 Associations of bisexual-specific minority stress and health among cisgender and transgender adults with bisexual orientation. *J. Sex Res* 54(7), 899–910. [PubMed: 27834488]

- Kelley ML, Ehlke SJ, Lewis RJ, Braitman AL, Bostwick W, Heron KE, Lau-Barraco C, 2018 Sexual coercion, drinking to cope motives, and alcohol-related consequences among self-identified bisexual women. *Subst. Use Misuse* 53(7), 1146–1157. [PubMed: 29278972]
- Kerr D, Ding K, Burke A, Ott-Walter K, 2015 An alcohol, tobacco, and other drug use comparison of lesbian, bisexual, and heterosexual undergraduate women. *Subst. Use Misuse* 50(3), 340–349. [PubMed: 25488100]
- Kerridge BT, Pickering RP, Saha TD, Ruan WJ, Chou SP, Zhang H, Jung J, Hasin DS, 2017 Prevalence, sociodemographic correlates and DSM-5 substance use disorders and other psychiatric disorders among sexual minorities in the United States. *Drug Alcohol Depend.* 170, 82–92. [PubMed: 27883948]
- Lee JH, Gamarel KE, Bryant KJ, Zaller ND, Operario D, 2016 Discrimination, mental health, and substance use disorders among sexual minority populations. *LGBT Health* 3(4), 258–265. [PubMed: 27383512]
- Lehavot K, Simoni JM, 2011 The impact of minority stress on mental health and substance use among sexual minority women. *J. Consult. Clin. Psychol* 79(2), 159–170. [PubMed: 21341888]
- Li T, Dobinson C, Scheim AI, Ross LE, 2013 Unique issues bisexual people face in intimate relationships: A descriptive exploration of lived experience. *Journal of Gay & Lesbian Mental Health* 17(1), 21–39.
- Lopez G, Yeater EA, 2018 Comparisons of sexual victimization experiences among sexual minority and heterosexual women. *J Interpers Violence*, 886260518787202.
- McCabe SE, Hughes TL, West BT, Veliz P, Boyd CJ, 2019 DSM-5 alcohol use disorder severity as a function of sexual orientation discrimination: A national study. *Alcohol. Clin. Exp. Res* 43(3), 497–508. [PubMed: 30740750]
- McCabe SE, Matthews AK, Lee JGL, Veliz P, Hughes TL, Boyd CJ, 2018 Tobacco use and sexual orientation in a national cross-sectional study: Age, race/ethnicity, and sexual identity-attraction differences. *Am. J. Prev. Med* 54(6), 736–745. [PubMed: 29656916]
- Mereish EH, Goldbach JT, Burgess C, DiBello AM, 2017 Sexual orientation, minority stress, social norms, and substance use among racially diverse adolescents. *Drug Alcohol Depend.* 178, 49–56. [PubMed: 28641130]
- Meyer IH, 2003 Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychol. Bull* 129(5), 674–697. [PubMed: 12956539]
- Operario D, Gamarel KE, Grin BM, Lee JH, Kahler CW, Marshall BD, van den Berg JJ, Zaller ND, 2015 Sexual minority health disparities in adult men and women in the United States: National Health and Nutrition Examination Survey, 2001-2010. *Am. J. Public Health* 105(10), e27–34.
- Praeger R, Roxburgh A, Passey M, Mooney-Somers J, 2019 The prevalence and factors associated with smoking among lesbian and bisexual women: Analysis of the Australian national drug strategy household survey. *International Journal of Drug Policy* 70, 54–60. [PubMed: 31082663]
- Ross LE, Salway T, Tarasoff LA, MacKay JM, Hawkins BW, Fehr CP, 2018 Prevalence of depression and anxiety among bisexual people compared to gay, lesbian, and heterosexual individuals: A systematic review and meta-analysis. *J. Sex Res* 55(4–5), 435–456. [PubMed: 29099625]
- Salway T, Ross LE, Fehr CP, Burley J, Asadi S, Hawkins B, Tarasoff LA, 2019 A systematic review and meta-analysis of disparities in the prevalence of suicide ideation and attempt among bisexual populations. *Arch. Sex. Behav* 48(1), 89–111. [PubMed: 29492768]
- Schuler MS, Dick AW, Stein BD, 2019a Sexual minority disparities in opioid misuse, perceived heroin risk and heroin access among a national sample of US adults. *Drug Alcohol Depend.* 201, 78–84. [PubMed: 31200278]
- Schuler MS, Rice CE, Evans-Polce RJ, Collins RL, 2018 Disparities in substance use behaviors and disorders among adult sexual minorities by age, gender, and sexual identity. *Drug Alcohol Depend.* 189, 139–146. [PubMed: 29944989]
- Schuler MS, Stein BD, Collins RL, 2019b Differences in substance use disparities across age groups in a national cross-sectional survey of lesbian, gay, and bisexual adults. *LGBT Health* 6(2), 68–76. [PubMed: 30735084]

- Taggart TC, Rodriguez-Seijas C, Dyar C, Elliott JC, Thompson RG Jr., Hasin DS, Eaton NR, 2019 Sexual orientation and sex-related substance use: The unexplored role of bisexuality. *Behav. Res. Ther* 115, 55–63. [PubMed: 30594299]
- Talley AE, Hughes TL, Aranda F, Birkett M, Marshal MP, 2014 Exploring alcohol-use behaviors among heterosexual and sexual minority adolescents: Intersections with sex, age, and race/ethnicity. *Am. J. Public Health* 104(2), 295–303. [PubMed: 24328614]
- Talley AE, Sher KJ, Steinley D, Wood PK, Littlefield AK, 2012 Patterns of alcohol use and consequences among empirically derived sexual minority subgroups. *Journal of Studies on Alcohol and Drugs* 73(2), 290–302. [PubMed: 22333337]
- Talley AE, Turner B, Foster AM, Phillips G 2nd, 2019 Sexual minority youth at risk of early and persistent alcohol, tobacco, and marijuana use. *Arch. Sex. Behav* 48(4), 1073–1086. [PubMed: 30604172]
- Taylor J, 2018 Bisexual mental health: A call to action. *Issues Ment. Health Nurs* 39(1), 83–92. [PubMed: 29286831]
- Turell SC, Brown M, Herrmann M, 2018 Disproportionately high: an exploration of intimate partner violence prevalence rates for bisexual people. *Sex. Relation. Ther* 33(1-2), 113–131.
- Ullman SE, Lorenz K, Kirkner A, O'Callaghan E, 2018 Postassault substance use and coping: a qualitative study of sexual assault survivors and informal support providers. *Alcoholism Treatment Quarterly* 36(3), 330–353. [PubMed: 30555208]
- Ullman SE, Relyea M, Peter-Hagene L, Vasquez AL, 2013 Trauma histories, substance use coping, PTSD, and problem substance use among sexual assault victims. *Addict. Behav* 38(6), 2219–2223. [PubMed: 23501138]
- Wheldon CW, Kaufman AR, Kasza KA, Moser RP, 2018 Tobacco use among adults by sexual orientation: Findings from the population assessment of tobacco and health study. *LGBT Health* 5(1), 33–44. [PubMed: 29324177]
- Yost MR, Thomas GD, 2012 Gender and binegativity: Men's and women's attitudes toward male and female bisexuals. *Arch. Sex. Behav* 41(3), 691–702. [PubMed: 21597943]
- Zivony A, Saguy T, 2018 Stereotype deduction about bisexual women. *J. Sex Res* 55(4-5), 666–678. [PubMed: 29505276]

Highlights

- Bisexual women had higher rates of multiple substance use behaviors than L/G women
- Bisexual women had higher rates of alcohol use disorder than L/G women
- Bisexual men had significantly higher rates of cigar use than gay men
- No substance use measures for which bisexual adults had lower rates than L/G adults

Table 1.

Demographic characteristics by gender and sexual identity for 2015-2017 NSDUH adult respondents (n=126,463).

	WOMEN			MEN			Chi-square p-value
	Heterosexual	Lesbian/Gay	Bisexual	Heterosexual	Gay	Bisexual	
	n=62,038	n=1,321	n=4,289	n=56,184	n=1,410	n=1,221	
<i>Demographics</i>							
Age							<0.000
18-25	12.4%	20.9%	41.5%	14.4%	19.0%	29.9%	
26-34	14.8%	20.6%	28.5%	16.1%	22.1%	20.7%	
35-49	24.6%	23.0%	19.8%	25.3%	21.4%	19.5%	
50-64	26.2%	23.5%	7.8%	25.7%	28.2%	18.6%	
65+	21.9%	12.0%	2.4%	18.5%	9.4%	11.3%	
Race/ethnicity							<0.000
White	64.7%	63.8%	61.3%	65.3%	62.0%	59.1%	
Black	12.4%	15.7%	14.1%	11.0%	11.7%	10.3%	
Hispanic	15.1%	14.3%	15.7%	16.0%	18.1%	20.2%	
Other	7.9%	6.2%	8.9%	7.6%	8.2%	10.4%	
Education							<0.000
< High school	11.8%	10.4%	13.0%	13.8%	7.9%	13.5%	
High school	23.5%	19.5%	26.9%	26.8%	16.2%	24.6%	
Some college / 2 yr degree	32.8%	35.2%	38.4%	29.0%	29.5%	31.6%	
4 yr college degree	31.9%	34.9%	21.8%	30.5%	46.4%	30.4%	
Employment							<0.000
Full time	41.6%	52.0%	44.3%	57.8%	56.4%	51.5%	
Part time	15.9%	11.8%	19.7%	10.0%	13.9%	15.2%	
Unemployed	3.7%	7.0%	9.2%	5.0%	6.5%	6.2%	
Student	36.9%	26.7%	22.9%	25.2%	20.2%	23.0%	
Other	1.8%	2.4%	3.9%	1.9%	3.1%	4.1%	
Marital status							<0.000
Married	51.5%	25.5%	24.8%	55.5%	15.7%	27.8%	
Widowed	8.9%	3.2%	1.1%	3.0%	1.4%	2.9%	
Divorced/separated	15.9%	11.9%	15.7%	12.1%	6.6%	9.0%	
Never married	23.8%	59.4%	58.4%	29.3%	76.2%	60.3%	
Children <18 in household							<0.000
Yes	39.3%	31.4%	48.3%	35.2%	11.7%	27.9%	
Total Family Income							<0.000
Less than \$20,000	18.3%	24.7%	28.1%	14.4%	17.2%	24.2%	
\$20,000 - \$49,999	30.4%	29.3%	34.4%	28.8%	28.2%	33.2%	
\$50,000 - \$74,999	16.2%	14.7%	13.6%	16.3%	18.6%	15.5%	

	WOMEN			MEN			Chi-square p-value
	Heterosexual	Lesbian/Gay	Bisexual	Heterosexual	Gay	Bisexual	
	n=62,038	n=1,321	n=4,289	n=56,184	n=1,410	n=1,221	
\$75,000 or More	35.1%	31.4%	23.9%	40.4%	35.9%	27.1%	
Has health insurance	92.2%	88.6%	86.9%	88.5%	89.2%	86.2%	<0.000
Urbanicity							<0.000
Large metro	55.3%	57.1%	57.9%	55.6%	69.7%	61.5%	
Small metro	30.1%	31.0%	30.4%	30.0%	22.6%	27.7%	
Non-metro	14.6%	12.0%	11.7%	14.4%	7.8%	10.8%	

Note: Prevalence estimates and chi-square tests are weighted to account for NSDUH survey design.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2.

Women's substance use behaviors and disorders by sexual identity: Estimated odds ratios comparing across sexual identity groups.

	Heterosexual	Lesbian/gay	Bisexual	Bisexual vs. Lesbian/gay	Bisexual vs. Heterosexual	Lesbian/gay vs. Heterosexual
	%	%	%	aOR [95% CI]	aOR [95% CI]	aOR [95% CI]
<i>Substance use behaviors</i>						
Past-month binge alcohol use	21.2%	30.1%	38.7%	1.29 [1.02, 1.63]	1.55 [1.37, 1.75]	1.20 [0.98, 1.47]
Past-month cigarette smoking	17.1%	28.1%	36.2%	1.19 [0.92, 1.54]	1.85 [1.64, 2.09]	1.55 [1.23, 1.95]
Past-year cigar use	3.5%	10.5%	14.2%	1.11 [0.82, 1.50]	2.63 [2.25, 3.07]	2.36 [1.79, 3.11]
Past-year marijuana use	10.3%	26.1%	40.0%	1.42 [1.09, 1.85]	2.89 [2.54, 3.29]	2.04 [1.61, 2.59]
Past-year illicit drug use (non-marijuana)	7.1%	14.3%	25.1%	1.55 [1.16, 2.07]	2.31 [2.02, 2.65]	1.49 [1.14, 1.94]
Past-year opioid misuse	3.5%	7.0%	12.6%	1.53 [1.05, 2.22]	2.37 [1.99, 2.82]	1.55 [1.10, 2.18]
<i>Substance use disorders</i>						
Past-year alcohol use disorder	3.9%	7.7%	12.5%	1.48 [1.03, 2.12]	2.19 [1.84, 2.61]	1.48 [1.07, 2.05]
Past-month nicotine dependence	8.4%	13.1%	16.5%	1.17 [0.81, 1.68]	1.67 [1.42, 1.97]	1.43 [1.02, 2.00]
Past-year substance use disorder	1.6%	4.3%	8.5%	1.46 [0.99, 2.16]	2.53 [2.07, 3.10]	1.73 [1.21, 2.48]

Note: Boldface indicates statistical significance ($p < 0.05$). All odds ratio (OR) estimates are weighted to account for NSDUH survey design and adjusted for age, race/ethnicity, education level, employment, marital status, living with children under age 18, household income, health insurance status, and urbanicity. For each outcome, 95% CIs are estimated using the Sidak correction to account for multiple comparisons across sexual identity subgroups.

Table 3.

Men's substance use behaviors and disorders by sexual identity: Estimated odds ratios comparing across sexual identity groups.

	Heterosexual	Gay	Bisexual	Bisexual vs. Gay aOR [95% CI]	Bisexual vs. Heterosexual aOR [95% CI]	Gay vs. Heterosexual aOR [95% CI]
	%	%	%			
<i>Substance use behaviors</i>						
Past-month binge alcohol use	31.8%	37.4%	33.0%	0.89 [0.66, 1.22]	0.87 [0.69, 1.10]	0.97 [0.79, 1.20]
Past-month cigarette smoking	22.9%	28.0%	27.1%	0.85 [0.61, 1.18]	1.08 [0.85, 1.38]	1.27 [1.01, 1.61]
Past-year cigar use	15.1%	10.5%	16.1%	1.64 [1.11, 2.43]	0.81 [0.62, 1.06]	0.50 [0.37, 0.67]
Past-year marijuana use	17.0%	29.1%	30.2%	1.08 [0.77, 1.51]	1.39 [1.09, 1.78]	1.29 [1.02, 1.64]
Past-year illicit drug use (non-marijuana)	10.0%	24.0%	19.5%	0.75 [0.53, 1.04]	1.48 [1.15, 1.91]	1.98 [1.58, 2.50]
Past-year opioid misuse	5.0%	8.4%	8.1%	0.91 [0.56, 1.46]	1.26 [0.89, 1.79]	1.39 [0.99, 1.95]
<i>Substance use disorders</i>						
Past-year alcohol use disorder	7.8%	14.0%	11.6%	0.88 [0.59, 1.32]	1.17 [0.86, 1.59]	1.33 [1.01, 1.75]
Past-month nicotine dependence	10.8%	13.0%	12.9%	0.86 [0.56, 1.35]	1.22 [0.88, 1.68]	1.41 [1.03, 1.93]
Past-year substance use disorder	3.5%	8.9%	7.3%	0.71 [0.44, 1.14]	1.37 [0.97, 1.93]	1.92 [1.38, 2.68]

Note: Boldface indicates statistical significance ($p < 0.05$). All odds ratio (OR) estimates are weighted to account for NSDUH survey design and adjusted for age, race/ethnicity, education level, employment, marital status, living with children under age 18, household income, health insurance status, and urbanicity. For each outcome, 95% CIs are estimated using the Sidak correction to account for multiple comparisons across sexual identity subgroups.