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Medical, Nonmedical, and Illegal Stimulant Use by Sexual Identity and Gender

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Abstract

Introduction: Major knowledge gaps regarding medical and nonmedical prescription stimulant use and illegal stimulant use (i.e., cocaine/crack/methamphetamine) by sexual identity and gender have implications for individuals' health and well-being. This study improves stimulant use measurement by differentiating type of stimulant use and focusing on lesbian, gay, and bisexual subpopulations.

Methods: Data were pooled for adults in the 2015–2017 National Survey on Drug Use and Health ($n=126,463$; analyzed in 2019). Gender-stratified logistic regression models examined associations between sexual identity and past-year illegal stimulant use. Gender-stratified multinomial logistic regression models estimated odds of: (1) medical use only versus no past-year prescription stimulant use, (2) any nonmedical stimulant use versus no past-year use, and (3) any nonmedical stimulant use versus medical use only.

Results: Illegal stimulant use varied by sexual identity (men: gay, 9.2%; bisexual, 7.5%; heterosexual, 3.2%; women: gay/lesbian, 3.2%; bisexual, 7.8%; heterosexual, 1.5%), as did nonmedical prescription stimulant use. Relative to same-gender heterosexuals, gay (AOR=2.61, 95% CI=2.00, 3.40) and bisexual men (AOR=1.70, 95% CI=1.24, 2.33) had higher odds of past-year illegal stimulant use, as did gay/lesbian (AOR=1.63, 95% CI=1.16, 2.28) and bisexual women (AOR=2.70, 95% CI=2.23, 3.26). Sexual minorities reported higher odds of nonmedical prescription stimulant use than heterosexuals. Any nonmedical prescription opioid use was

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reported by 26.4% of people who reported nonmedical stimulant use, and 27.0% of people who reported illegal stimulant use.

Conclusions: Lesbian, gay, and bisexual individuals had a higher prevalence stimulant use than their heterosexual counterparts. This has important implications for health disparities, particularly given high levels of polysubstance use. Taking a multilevel approach is crucial to reduce stimulant-related harms for lesbian, gay, and bisexual individuals.

INTRODUCTION

Prescription stimulant use has increased in the U.S. during the last decade^{1–3} and the number of prescribed stimulants doubled from 2006 to 2016.^{2,4} Though medically indicated for conditions such as attention-deficit/hyperactivity disorder, medical stimulant use is associated with emotional problems^{5,6} and poorer cardiovascular health.⁷ Nonmedical prescription stimulants use (i.e., use of prescription stimulants in ways not directed by a doctor) has also increased: Approximately 3.1% of U.S. adults⁸ and 10% of college students report past-year nonmedical use.^{9,10} Nonmedical prescription stimulant use is higher among individuals who are male,^{8,11–13} of higher SES,¹⁴ aged 18–25 years,^{4,8,15} and white.^{4,8,15} Although the media often portrays nonmedical prescription stimulant use as enhancing academic performance, it is associated with lower grades,^{18,19} drug dependence,^{4,20} and other substance use (i.e., polysubstance use),^{4,21,22} including illegal stimulants.^{19,21,23} Illegal stimulant use (e.g., cocaine/crack, methamphetamine) is also higher among individuals who are male,²⁴ aged 18–25 years,²⁵ and without a college education.²⁵ Illegal stimulant use is associated with an increased risk for infectious diseases (e.g., HIV),²⁶ lower economic participation,²⁷ poor mental health outcomes,²⁸ substance use disorder,²⁰ and unintentional overdose.²⁹ Because of these negative consequences, identifying populations with higher nonmedical or illegal stimulant use, such as sexual minorities, can lead to targeted interventions to minimize stimulant use-related harm.

Lesbian, gay, and bisexual (LGB) individuals report higher substance use (e.g., alcohol, marijuana, cigarettes, and other drugs^{30–32}) and substance use disorders than their heterosexual counterparts.^{30–33} Though LGB individuals report higher nonmedical prescription drug use,³¹ that is rarely disaggregated by type of prescription (i.e., stimulant versus opioids). Illegal stimulant use is disproportionately high among LGB individuals: Past-year cocaine use was 6.6% (vs 2.0% among heterosexuals) and methamphetamines was 2.5% (vs 0.69% among heterosexuals).²⁴ However, these national-level data have yet to be disaggregated by LGB subgroup and gender. Higher drug use among LGB individuals is likely a result of minority stress—that is, exposure to stigma and discrimination based on sexual orientation results in health disparities.³⁴ Structural stigma (e.g., employment or housing discrimination) drives psychological and physical health morbidities among LGB populations, and perceived stigma is associated with cocaine use.³⁵ Bisexuals experience “double discrimination” from heterosexuals and lesbian and gay communities,^{36,37} which may account for the particularly high substance use among bisexual individuals.

Major knowledge gaps remain about the medical and nonmedical use of prescription stimulants, and illegal stimulant use, by sexual identity. Although existing research suggests

that LGB individuals are at higher risk for prescription stimulant use than heterosexuals,^{38–40} this research has important measurement limitations. First, studies focusing on specific LGB subpopulations, such as methamphetamine use among gay men,^{41,42} exclude other sexual identities. Studies also explore stimulant use separately (i.e., medical use versus nonmedical use), instead of characterizing patterns by type of use.⁴³ Relatedly, most studies combine all forms of prescription drug use (e.g., stimulants and opioids),^{32,44} which obscures important patterns. Lastly, despite women reporting a lower prevalence of use, methamphetamine use has increased significantly among women since 2017.²⁴ Given these discrepancies, this study explores separate analyses by gender.

The current study aims to improve the measurement of stimulant use by differentiating medical, nonmedical, and illegal stimulant use, and focusing on LGB subpopulations, who are at elevated risk of use. The 2015–2017 National Survey on Drug Use and Health (NSDUH) is used to: (1) describe the prevalence of medical prescription stimulant use, nonmedical prescription stimulant use, and illegal stimulant use by sexual identity and gender in a national sample of U.S. adults and (2) describe differences in overlapping stimulant use and polysubstance use by sexual identity. Stimulant use outcomes are expected to be higher among LGB individuals compared with heterosexuals, and highest among bisexual women and gay men compared with other sexual identity and gender subgroups. Characterizing LGB-based disparities among adults can help identify different points for multilevel interventions, such as increased screening and access to treatment at the clinical-level, and policy-level legislation to increase healthcare access and minimize LGB-focused housing and workforce discrimination, which are associated with substance use.⁴⁵

METHODS

Study Sample

The 2015–2017 NSDUH included data from annual cross-sectional surveys assessing substance use among a nationally representative sample of the U.S. civilian population. Data were collected using face-to-face household interviews, computer-assisted interviewing, and audio computer-assisted survey instruments to maximize participant privacy. Additional details can be found elsewhere.^{24,46} The weighted interview response rates among adults for 2015–2017 ranged from 66.3% to 68.4%.⁴⁶

Observations were pooled across the three years ($N=170,319$), adding a year indicator and dividing yearly survey weights by three. Individuals who lacked sexual identity data, including individuals aged 12–17 years ($n=41,579$; 9.2%), were excluded, as were adults who responded *don't know/refuse* to the sexual identity item ($n=2,277$; 1.7%). The final analytic sample included 126,463 adults.

Measures

Participants were asked: *Which of the following do you consider yourself to be?* Response categories included *heterosexual, that is, straight, lesbian or gay, bisexual, don't know*, and *refuse to answer*. A three-level variable was created to describe mutually exclusive sexual

identities, including heterosexual, gay/lesbian, or bisexual adults. Individuals who selected *don't know* or refused to answer were excluded.

Participants were asked if they had used prescription stimulants (e.g., Adderall, Ritalin, Dextroamphetamine) in the past 12 months. People who reported any past-year prescription stimulant use were further asked if they had used prescription stimulants in a way other than the doctor had directed in the past 12 months, which identified people reporting nonmedical prescription stimulant use. A three-level categorical variable was created to reflect past-year use: (1) no use, (2) medical use only (i.e., prescription stimulant use but no self-reported nonmedical use), or (3) any nonmedical use of prescription stimulants.

Participants were asked if they had used cocaine or methamphetamine in the past 12 months. A dichotomous variable of illegal stimulant use was created to indicate any cocaine or methamphetamine use in the past year.

To assess the overlap between past year nonmedical and illegal stimulant use, the three-level categorical variable included: (1) only nonmedical prescription stimulant use, (2) only illegal stimulant use, and (3) use of both nonmedical prescription stimulants and illegal stimulants.

Participants reported whether they drank any alcohol, used marijuana, prescription opioids, or heroin in the past year. Past-month binge drinking was defined as five or more (males) or four or more (females) drinks in a single occasion.

Sociodemographic variables included age (18–25, 26–34, 35–49, 50 years), race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic any race, non-Hispanic other), annual household income (<\$20,000, \$20,000–\$49,999, \$50,000–\$74,999, \$75,000), population density (large metro, small metro, non-metro), and survey year indicators. The NSDUH computer-assisted interview guide determines gender by asking the interviewer to “record respondent’s gender: male or female.”

Statistical Analysis

The weighted prevalence of (1) medical prescription stimulants, (2) nonmedical prescription stimulants, and (3) illegal stimulants (i.e., cocaine or methamphetamine) was calculated by sexual identity and gender. Demographic characteristics were described for individuals who reported using any stimulant nonmedically or illegally, differentiating past-year nonmedical use only, illegal use only, or both. Gender-stratified multinomial logistic regression models estimated odds of: (1) medical prescription stimulant use only versus no past-year prescription stimulant use, (2) any nonmedical stimulant use versus no nonmedical use, and (3) any nonmedical stimulant use versus medical use only. A gender-stratified logistic regression model examined the association between sexual identity and past-year illegal stimulant use. All models adjusted for sociodemographics. Analyses were conducted in SAS, version 9.4 and accounted for the NSDUH complex survey design using sampling weights. All statistical tests were two-sided and considered statistically significant at the Bonferroni-adjusted p -value of <0.0125. These data, analyzed in 2019, were deemed non-human subjects research.

RESULTS

The sample was 48.4% male and majority white (64.8%), followed by Hispanic (15.6%) and black (11.8%). The majority (52.5%) reported an annual income of \$50,000 and lived in a large metro area (53.8%) (Table 1).

The prevalence of past-year medical stimulant use for U.S. adults was 4.5% among heterosexuals, 7.0% among gays/lesbians, and 7.4% among bisexuals; prevalence of non-medical use was 1.9%, 4.5%, and 6.8% respectively (Table 1). Prevalence of illegal stimulant use was 2.3% for heterosexuals, 6.6% for gays/lesbians, and 7.7% for bisexual adults.

Differences in past year prescription stimulant use, nonmedical prescription stimulant use and illegal stimulant use emerged by gender and sexual identity (Figure 1). Past-year medical stimulant use was higher for women (4.9%–7.9%) compared with men (4.1%–6.4%).

Past-year nonmedical stimulant use was higher among gay men than gay/lesbian women (5.4% vs 3.3%), whereas there were no gender differences among heterosexuals or bisexuals. Illegal stimulant use was twofold higher among heterosexual men than women (3.2% vs 1.5%), nearly threefold higher among gay men than gay/lesbian women (9.2% vs 3.2%), and consistent across bisexual men and women (7.5% vs 7.8%).

There were gender and sexual identity specific disparities in patterns of medical and nonmedical prescription stimulant use. In adjusted models, gay men were more likely than heterosexual men to report medical stimulant use (adjusted relative OR [AROR]=1.62, 95% CI=1.25, 1.10) (Table 2). Similar patterns emerged for bisexual women (AROR=1.39, 95% CI=1.18, 1.63) but not gay/lesbian women. Compared with heterosexual men, bisexual men (AROR=1.86, 95% CI=1.40, 2.47) and gay men (AROR=2.01, 95% CI=1.48, 2.73) were more likely to report nonmedical versus no prescription stimulant use. Similarly, bisexual (AROR=2.05, 95% CI=1.73, 2.43) and gay/lesbian women (AROR=1.70, 95% CI=1.21, 2.38) were more likely than heterosexual women to report nonmedical prescription stimulant use. Among people who reported any prescription stimulant use, only bisexual women were more likely than heterosexual women to report nonmedical use (AROR=1.47, 95% CI=1.20, 1.81) than medical stimulant use. There were no statistically significant gender-specific differences comparing type of prescriptions stimulant use between bisexual and gay/lesbian men and women.

Patterns of illegal stimulant use differed by gender and sexual identity. Compared with heterosexual men, bisexual men were more likely to report past-year illegal use (AOR=1.70, 95% CI=1.24, 2.33), as were gay men (AOR=2.61, 95% CI=2.00, 3.40). Bisexual (AOR=2.70, 95% CI=2.23, 3.26) and gay/lesbian women (AOR=1.63, 95% CI=1.16, 2.28) were more likely to report past-year illegal stimulant use than their heterosexual counterparts.

The study also explored patterns of polysubstance use by sociodemographic characteristics among adults who use stimulants, differentiating by use of nonmedical prescription

stimulants only, illegal stimulant use, or both. Among adults who reported nonmedical stimulant use, 1.1% reported heroin use and 52.3% nonmedical prescription opioid use. Among adults who reported only illegal stimulant use, 9.6% also reported heroin use, while 58.2% also reported nonmedical prescription opioid use. Among adults who reported both nonmedical prescription stimulant and illegal stimulant use, 10.4% reported heroin use, while 44.5% also reported nonmedical prescription opioid use. Gender differences emerged by LGB status for individuals who reported nonmedical use of prescription stimulants or illegal stimulant use or both (Table 3).

DISCUSSION

This study is the first to use a nationally representative sample of U.S. adults to describe LGB-related disparities in the use of medical and nonmedical prescription stimulants and illegal stimulants. Patterns of nonmedical use and illegal use differed by gender and sexual identity: LGB adults reported higher medical and nonmedical prescription stimulant use and illegal stimulant use than their heterosexual counterparts. Though additional work is needed to explore potential differences in this relationship by gender, findings are consistent with the minority stress model.^{47,48} This model may be particularly salient for bisexual individuals, who can face discrimination from both heterosexual and sexual minority communities,^{36,37,49} though such communities can also be sources of support. This highlights the need for future harm reduction interventions to target stimulant use among LGB populations. The findings have important implications across sexual identities, particularly related to polysubstance use, as 25%–50% of people reporting nonmedical and illegal stimulant use also used other substances (e.g., nonmedical prescription opioid use).

The magnitude of LGB disparities in illegal stimulant use is concerning: Bisexual women's illegal stimulant use was fivefold that of heterosexual women, while gay men's use was threefold that of heterosexual men. By contrast, gay/lesbian women reported lower illegal stimulant use than bisexuals or gay men, but prevalence was still twofold higher than heterosexual women. This study builds on past research reporting disproportionately high rates of illegal^{26,50,51} (and nonmedical prescription^{52–54}) stimulant use among men who have sex with men (MSM). The findings extend these associations to include sexual identity, not sexual behavioral (e.g., bisexual or gay men versus MSM). Owing to the past focus on MSM and illegal stimulant use, little is known about the patterns of LGB women's use. Studies frequently collapse LGB women, eliminating the potential to tease out differences between bisexual and lesbian/gay women, as the authors have done. In a recent study, bisexual adult women reported higher rates of all substance use measures than lesbian/gay women,⁵⁵ though they did not measure stimulant use. Bisexual women have reported higher past-year and daily marijuana use than gay/lesbian women,^{31,56} and gay/lesbian women report higher lifetime cocaine use than heterosexual women.⁵⁷ The current findings begin to build the evidence to fill this knowledge gap.

Though beyond the scope of this study, understanding drivers of illegal and nonmedical stimulant use merits further attention. Substantial research has explored drivers of illegal stimulant for MSM,^{42,58} primarily in the context of HIV.^{26,50} These include experiences of social discrimination,⁵¹ sexuality-related stigma,⁵¹ and racism.⁵⁹ Though the drivers of

illegal stimulant use among bisexual women are likely similar—for example, homophobia and social and gender discrimination—future work should explicitly explore them in this understudied subgroup. Differences in illegal stimulant use may also result from differences in overall patterns of drug use (e.g., there are fewer gender differences among sexual minorities for past-year nonmedical opioid use⁶⁰ and past-year and daily marijuana use).⁵⁰

The high prevalence of illegal stimulant use, combined with nonmedical stimulant use, could increase LGB individuals' risks for negative consequences related to stimulant use. These potential consequences include substance use disorder and overdose^{61,62}, given increases in fentanyl contamination in illegally produced pills⁶³ and cocaine and methamphetamine.^{64,65} Moreover, a high percentage of individuals who reported illegal and nonmedical stimulant use also reported prescription opioid use. Some experts warn that stimulant use disorders could be the next epidemic, indicating the need for research to understand who is most at risk for exposure to stimulant-related adverse outcomes.^{62–66}

Nonmedical use of prescription stimulants was significantly higher for LGB individuals. This extends previous findings to adults, as most existing evidence was based on college students^{39,40} or youth.^{32,40} Bisexual women reported twofold higher nonmedical use and illegal stimulant use than gay/lesbian women. Findings addressed past study measurement limitations among bisexuals, such as combining all nonmedical prescription drug use (i.e., stimulants and opioid use³¹) or folding illegal stimulant use in an “any illegal drug” category, which made it difficult to tease apart drivers potentially unique to stimulant use.³¹

Future research should explore structural drivers of nonmedical and illegal stimulant use for LGB individuals to better understand causes of the differences by gender and sexual identity (particularly gay men and bisexuals), such as state-level factors that might drive substances use (e.g., homophobia^{35,67} or regulations of physician prescribing patterns).^{2,68,69} Individual-level analyses that also include state-level variables should control for state-level differences in laws relating to sexual minority discrimination (e.g., housing- and employment-based discrimination), which may affect substance use. Work should also explore reasons why: (1) gay/lesbian women have a lower prevalence than their sexual minority peers, (2) medical stimulant use was higher for LGB individuals compared with heterosexuals, and (3) few differences in medical use existed within LGB individuals. Work should also explore stimulant use patterns among individuals who chose the *don't know* category of sexual identity. Patterns of use among youth remain of interest, as many prescriptions for stimulants begin at age 12–17 years.

Limitations

This study used nationally representative data to compare and disaggregate stimulant use by sexual identity and gender. Limitations include that sexual identity and substance use measures were self-reported, which may lead to recall bias or socially desirable reporting.⁷⁰ This exploratory study did not adjust for multiple comparisons. Owing to NSDUH's question framing, the authors could not differentiate between only nonmedical use and both nonmedical and medical use. The NSDUH started assessing sexual identity among adults in 2015, so these relationships could not be examined in earlier years or among adolescents. The NSDUH options for gender include only “male” or “female” and thus did not allow

researchers to differentiate between transgender and cis-gender individuals. The NSDUH did not explicitly oversample LGB populations, so findings may not be representative of all LGB adults; this also meant that the authors had to exclude the *don't know* category of sexual identity owing to lack of power to estimate gender-specific effects. The NSDUH does not assess sexual behavior, so this study only captured associations based on individuals' sexual identity. The NSDUH excluded individuals who are incarcerated or homeless,⁴⁶ among whom LGB individuals are over-represented.⁷¹

CONCLUSIONS

In this study, LGB individuals had uniformly higher stimulant use than their heterosexual peers. Exploring the drivers of stimulant use is important for health disparities, given the risk for disordered use and overdose, and in the context of increased fentanyl contamination of illegal stimulants.^{29,65} Widespread stimulant use—alongside opioid use—is referred to as the “fourth wave” of the epidemic.⁶⁶ Multilevel interventions to minimize stimulant-related harms, many of which require clinical support, should pay particular attention to LGB populations. Providers who focus on LGB communities should screen for and discuss substance use, including stimulants, as the U.S. Preventive Services Task Force updated its draft recommendations for substance use screening to demonstrate moderate evidence.⁷² Drug screening and discussions with providers remain low,⁷³ indicating that additional training and resources may be required to increase discussions about stimulant use and related treatment options tailored for LGB adults. Communities and providers can scale up access to medication disposal and harm reduction services. Structural-level targets include reducing unnecessary prescribing, offering non-stigmatizing and affordable treatment when clinically indicated,⁷⁴ and addressing fentanyl contamination through harm reduction approaches, such as providing fentanyl test strips.⁷⁵ Taking such a multilevel approach is crucial to reduce unintended stimulant-related harms that could disproportionately impact LGB adults.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.
Prevalence of medical and nonmedical prescription stimulant, and illegal stimulant use:
sexual identity and gender.

Table 1.

Sociodemographic Characteristics of Adults by Sexual Identity and Medical and Non-Medical Prescription Stimulant and Illegal Stimulant Use

Factor	Overall N (wt col %)	Heterosexual (N=118,222) Wt row % (SE)				Gay/Lesbian (N=2,731) Wt row % (SE)				Bisexual (N=5,510) Wt row % (SE)			
		Prescription stimulant use			Illegal stimulant use	Prescription stimulant use			Illegal stimulant use	Prescription stimulant use			Illegal stimulant use
		Any	Medical only	Non- medical		Any	Medical only	Non- medical		Any	Medical only	Non- medical	
Overall, N (wt %)		10,005 (6.5)	6,172 (4.5)	3,833 (2.0)	3,774 (2.3)	379 (11.5)	220 (7.0)	159 (4.5)	211 (6.6)	898 (14.2)	462 (7.4)	436 (6.8)	451 (7.7)
Gender													
Male	58,815 (48.4)	6.5 (0.1)	4.1 (0.1)	2.4 (0.1)	3.2 (0.1)	12.0 (1.0)	6.6 (0.7)	5.4 (0.8)	9.2 (1.1)	13.0 (1.1)	6.4 (0.8)	6.6 (0.9)	7.5 (5.4)
Female	67,648 (51.6)	6.5 (0.1)	4.9 (0.1)	1.6 (0.1)	1.5 (0.1)	10.7 (1.2)	7.4 (1.1)	3.3 (0.5)	3.2 (0.5)	14.7 (0.7)	7.9 (0.4)	6.8 (0.7)	7.8 (0.6)
Age, years													
18–25	41,379 (14.2)	14.1 (0.2)	6.8 (0.2)	7.3 (0.2)	5.7 (0.2)	19.2 (1.4)	9.7 (1.1)	9.4 (1.0)	11.1 (1.2)	18.0 (0.8)	8.3 (0.6)	9.7 (0.5)	9.8 (0.7)
26–34	26,114 (15.9)	9.2 (0.3)	5.6 (0.2)	3.6 (0.2)	4.4 (0.2)	16.4 (2.3)	9.1 (1.3)	7.3 (1.4)	10.4 (1.6)	15.5 (1.6)	7.9 (1.0)	7.6 (1.0)	7.4 (1.0)
35–49	33,090 (24.7)	6.1 (0.1)	4.9 (0.1)	1.2 (0.1)	1.9 (0.1)	10.2 (1.5)	6.4 (1.0)	3.8 (1.0)	6.6 (1.4)	11.5 (1.2)	7.0 (1.0)	4.5 (0.9)	6.7 (0.9)
50	25,880 (45.2)	3.6 (0.1)	3.3 (0.1)	0.3 (0.1)	0.9 (0.1)	5.2 (1.1)	4.7 (1.1)	0.5 (0.4)	1.9 (0.8)	6.1 (1.7)	5.0 (1.6)	1.1 (0.6)	4.5 (1.5)
Race/ Ethnicity													
NH white	77,100 (64.8)	7.7 (0.1)	5.3 (0.1)	2.4 (0.1)	2.5 (0.1)	12.3 (1.3)	7.1 (0.8)	5.2 (0.7)	5.8 (0.9)	16.5 (0.9)	8.8 (0.7)	7.7 (0.7)	8.6 (0.7)
NH Black	15,888 (11.8)	3.5 (0.2)	2.9 (0.2)	0.6 (0.1)	2.0 (0.2)	7.1 (0.5)	3.5 (0.8)	3.6 (1.2)	8.7 (1.9)	7.8 (1.5)	4.1 (1.0)	3.7 (0.8)	4.8 (1.2)
Hispanic	21,186 (15.6)	4.7 (0.2)	3.3 (0.2)	1.4 (0.1)	2.3 (0.2)	13.5 (2.1)	10.1 (1.7)	3.4 (0.8)	8.3 (1.5)	12.2 (1.5)	5.6 (1.1)	6.6 (1.1)	7.2 (1.2)
Other	12,289 (7.8)	4.5 (0.2)	3.0 (0.2)	1.5 (0.1)	1.9 (0.2)	7.5 (2.0)	5.2 (1.7)	2.3 (0.8)	5.3 (1.9)	11.4 (1.5)	6.3 (1.1)	5.1 (0.9)	6.9 (1.3)
Income													
< \$20,000	26,280 (16.8)	7.8 (0.2)	4.9 (0.2)	2.9 (0.2)	4.2 (0.2)	12.4 (1.7)	8.1 (1.4)	4.3 (1.1)	10.0 (1.8)	14.5 (1.1)	7.6 (0.9)	6.9 (0.9)	10.8 (1.1)
\$20,000– \$49,999	39,996 (29.7)	5.7 (0.2)	4.1 (0.1)	1.6 (0.1)	2.4 (0.1)	11.5 (1.7)	7.4 (1.4)	4.1 (0.8)	5.1 (0.9)	14.9 (1.0)	7.7 (0.8)	7.2 (0.7)	6.9 (0.9)
\$50,000– \$74,999	38,548 (16.2)	6.3 (0.2)	4.6 (0.2)	1.7 (0.1)	2.1 (0.1)	9.8 (1.9)	5.0 (1.3)	4.8 (1.4)	5.0 (1.3)	11.7 (1.5)	6.4 (1.1)	5.3 (1.0)	5.5 (1.1)
\$75,000	40,435 (37.3)	6.6 (0.2)	4.7 (0.2)	1.9 (0.1)	1.6 (0.1)	11.7 (1.1)	7.0 (0.8)	4.7 (0.7)	6.5 (1.3)	14.3 (1.1)	7.5 (0.8)	6.8 (0.9)	6.6 (0.9)
Population density													
Large metro	53,653 (53.8)	6.4 (0.1)	4.4 (0.1)	2.0 (0.1)	2.4 (0.1)	12.2 (1.1)	7.3 (0.7)	4.9 (0.7)	7.5 (1.0)	13.6 (0.9)	6.5 (0.7)	7.1 (0.6)	8.5 (0.8)
Small metro	62,958 (40.4)	6.7 (0.1)	4.7 (0.1)	2.0 (0.1)	2.3 (0.1)	9.8 (1.1)	6.3 (0.8)	3.5 (0.6)	4.5 (0.7)	14.8 (1.0)	8.4 (0.8)	6.4 (0.6)	6.8 (0.6)

Factor	Overall N (wt col %)	Heterosexual (N=118,222) Wt row % (SE)				Gay/Lesbian (N=2,731) Wt row % (SE)				Bisexual (N=5,510) Wt row % (SE)			
		<u>Prescription stimulant use</u>			Illegal stimulant use	<u>Prescription stimulant use</u>			Illegal stimulant use	<u>Prescription stimulant use</u>			Illegal stimulant use
		Any	Medical only	Non- medical		Any	Medical only	Non- medical		Any	Medical only	Non- medical	
Rural	9,852 (5.8)	5.3 (0.3)	4.1 (0.2)	1.1 (0.1)	1.7 (0.2)	15.0 (3.6)	8.1 (3.1)	6.9 (2.4)	10.2 (3.9)	16.3 (3.3)	10.8 (2.5)	5.5 (2.3)	5.6 (1.7)

SE, survey adjusted standard error; wt. col %, survey weighted column percentage; wt. row %, survey weighted row percentage; NH, non-Hispanic.

Table 2.

Medical and Non-Medical Prescription Stimulant Use and Illegal Stimulant Use by Sexual Identity and Gender

Variable	Prescription stimulants ^a				Illegal stimulants ^b			
	Medical use ONLY vs no past-year prescription stimulant use ^{c,d}		Any non-medical use vs no past-year prescription stimulant use ^{c,d}		Any non-medical use vs medical use ONLY ^{d,e}		Any past-year illegal stimulant use vs no past-year illegal stimulant use	
	Men AROR (95% CI)	Women AROR (95% CI)	Men AROR (95% CI)	Women AROR (95% CI)	Men AROR (95% CI)	Women AROR (95% CI)	Men AROR (95% CI)	Women AROR (95% CI)
Heterosexual	ref	ref	ref	ref	ref	ref	ref	ref
Bisexual ^c	1.38 (1.05, 1.82)	1.39 (1.18, 1.63)	1.86 (1.40, 2.47)	2.05 (1.73, 2.43)	1.34 (0.91, 1.97)	1.47 (1.20, 1.81)	1.70 (1.24, 2.33)	2.70 (2.23, 3.26)
Lesbian/Gay ^c	1.62 (1.25, 2.10)	1.47 (1.08, 2.02)	2.01 (1.48, 2.73)	1.70 (1.21, 2.38)	1.24 (0.84, 1.84)	1.15 (0.79, 1.68)	2.61 (2.00, 3.40)	1.63 (1.16, 2.28)
Lesbian/Gay	ref	ref	ref	ref	ref	ref	ref	ref
Bisexual ^f	0.86 (0.61, 1.20)	0.94 (0.67, 1.33)	0.92 (0.66, 1.31)	1.21 (0.90, 1.63)	1.08 (0.67, 1.74)	1.06 (0.75, 1.50)	0.65 (0.42, 1.00)	1.65 (1.12, 2.44)

Notes: Boldface indicates statistical significance at Bonferroni adjusted $p < 0.0125$.

^a Multinomial logistic regression model.

^b Binary logistic regression model.

^c References: sexual identity: heterosexual, use: no past-year use.

^d Models adjust for survey year, age, race/ethnicity, annual household income, urbanicity.

^e References: sexual identity: heterosexual, use: past-year medical use

^f Sexual identity: lesbian/gay, use: no past-year use.

AROR, adjusted relative OR.

Table 3.

Sociodemographic Characteristics of U.S. Adults Reporting Past-Year Non-Medical or Illegal Stimulant Use by Sexual Identity

Factor	Heterosexual (N=6,410) Wt col % (SE)				Gay/Lesbian (N=311) Wt col % (SE)				Bisexual (N=718) Wt col % (SE)			
	Non-medical stimulant use only	Illegal stimulant use only	Both non- medical and illegal stimulant use	χ^2 <i>p</i> - value	Non-medical stimulant use only	Illegal stimulant use only	Both non- medical and illegal stimulant use	χ^2 <i>p</i> - value	Non-medical stimulant use only	Illegal stimulant use only	Both non- medical and illegal stimulant use	χ^2 <i>p</i> - value
Overall N (wt %)	2,636 (36.2)	2,577 (47.0)	1,197 (16.8)		100 (29.0)	152 (51.5)	59 (19.5)		267 (34.2)	282 (42.2)	169 (23.6)	
Sex				<0.0001				0.0020				0.2669
Male	56.7 (1.6)	68.7 (1.4)	64.6 (1.8)		56.4 (7.3)	76.7 (4.0)	85.1 (4.1)		23.9 (4.1)	24.8 (4.1)	33.6 (4.9)	
Female	43.3 (1.6)	31.3 (1.4)	35.4 (1.8)		43.6 (7.3)	23.3 (4.0)	14.9 (4.1)		76.1 (4.1)	75.2 (4.1)	66.3 (4.9)	
Age, years				<0.0001				0.4968				0.0237
18–25	50.3 (1.4)	26.5 (1.0)	50.0 (2.1)		39.5 (5.7)	29.0 (4.3)	45.3 (8.6)		56.7 (3.8)	46.4 (3.5)	52.2 (5.4)	
26–34	26.4 (1.3)	27.9 (1.3)	32.3 (1.8)		38.4 (7.0)	35.6 (4.8)	29.5 (8.3)		28.6 (4.4)	22.0 (3.6)	30.7 (5.3)	
35–49	16.0 (1.1)	23.5 (1.0)	13.0 (1.6)		18.5 (6.4)	23.1 (4.4)	19.4 (6.4)		12.2 (3.3)	18.6 (2.3)	14.3 (4.0)	
50	7.3 (1.1)	22.1 (1.4)	4.7 (1.3)		3.6 (3.4)	12.3 (5.7)	5.8 (5.4)		2.5 (1.7)	13.0 (4.2)	2.8 (2.6)	
Race/ Ethnicity				<0.0001				0.0141				0.1833
NH White	77.9 (0.9)	63.4 (1.6)	82.1 (1.6)		79.1 (5.1)	52.4 (6.6)	63.4 (7.3)		65.0 (4.0)	63.2 (4.0)	75.3 (4.0)	
NH Black	4.1 (0.4)	12.9 (1.2)	2.1 (0.5)		6.7 (2.8)	18.2 (3.7)	16.9 (6.2)		10.1 (2.5)	10.9 (2.9)	3.1 (1.5)	
Hispanic	11.7 (0.8)	17.1 (1.2)	10.0 (1.2)		11.7 (3.9)	23.3 (4.8)	14.0 (4.6)		17.2 (2.7)	16.4 (2.9)	15.4 (4.0)	
Other	6.3 (0.6)	6.5 (0.7)	5.7 (0.9)		2.5 (1.4)	6.0 (2.4)	5.6 (3.4)		7.7 (1.7)	9.5 (1.9)	6.1 (1.2)	
Education				<0.0001				0.2823				0.0039
Less than high school	7.4 (0.7)	18.1 (1.0)	8.6 (1.2)		3.9 (1.8)	13.5 (4.9)	10.4 (5.2)		3.7 (1.1)	16.7 (3.0)	6.8 (2.1)	
High school/GE D	17.6 (1.0)	29.5 (1.1)	20.5 (1.7)		16.3 (5.3)	23.4 (5.0)	14.5 (6.0)		29.2 (3.9)	27.3 (3.7)	23.3 (4.9)	
Some college	43.3 (1.4)	34.3 (1.1)	41.6 (1.9)		41.3 (5.8)	30.5 (3.8)	43.3 (8.6)		48.4 (4.7)	36.4 (3.9)	42.6 (5.3)	
College graduate	31.6 (1.3)	18.1 (0.9)	29.3 (2.4)		38.5 (6.7)	32.6 (3.8)	30.8 (6.2)		18.6 (3.7)	19.6 (3.9)	27.3 (4.2)	
Income				<0.0001				0.0472				0.0259
< \$20,000	22.8 (1.1)	30.5 (1.4)	27.9 (2.2)		9.6 (2.8)	30.1 (4.6)	34.4 (7.6)		22.6 (3.1)	39.7 (4.3)	35.0 (5.1)	
\$20,000– \$49,999	23.8 (1.1)	31.8 (1.4)	24.9 (1.5)		32.0 (6.1)	24.1 (5.6)	17.6 (6.0)		42.3 (3.7)	32.7 (4.1)	27.4 (4.1)	
\$50,000– \$74,999	14.1 (1.0)	14.4 (1.0)	14.0 (1.3)		20.6 (5.3)	12.1 (3.7)	14.7 (6.8)		9.4 (2.0)	8.3 (1.9)	13.3 (4.0)	

Factor	Heterosexual (N=6,410) Wt col % (SE)				Gay/Lesbian (N=311) Wt col % (SE)				Bisexual (N=718) Wt col % (SE)			
	Non-medical stimulant use only	Illegal stimulant use only	Both non- medical and illegal stimulant use	χ^2 <i>p</i> - value	Non-medical stimulant use only	Illegal stimulant use only	Both non- medical and illegal stimulant use	χ^2 <i>p</i> - value	Non-medical stimulant use only	Illegal stimulant use only	Both non- medical and illegal stimulant use	χ^2 <i>p</i> - value
\$75,000	39.3 (1.2)	23.3 (1.0)	33.2 (1.8)		37.8 (5.9)	33.7 (7.2)	33.3 (7.2)		25.7 (3.8)	19.3 (3.0)	24.3 (4.9)	
Urbanicity				0.3015				0.4700				0.7498
Large metro	54.6 (1.3)	55.9 (1.7)	57.4 (2.1)		66.1 (6.3)	71.8 (4.1)	70.9 (7.1)		56.2 (3.9)	61.9 (4.2)	63.9 (5.1)	
Small metro	42.2 (1.2)	39.6 (1.8)	38.8 (1.8)		31.2 (6.3)	24.6 (4.3)	21.4 (5.9)		40.0 (3.8)	34.9 (4.1)	33.7 (5.0)	
Rural	3.2 (0.4)	4.5 (0.5)	3.8 (0.7)		2.6 (1.5)	3.6 (1.6)	7.6 (4.1)		3.8 (1.8)	3.2 (1.1)	2.3 (1.3)	
Other substance use												
Any alcohol use	92.5 (0.8)	91.5 (0.8)	96.1 (1.1)	0.0107	90.3 (3.8)	89.7 (3.5)	92.5 (5.2)	0.8996	96.7 (2.4)	89.3 (2.9)	99.6 (0.3)	0.0039
Binge drinking, past month	64.3 (1.3)	67.1 (1.3)	77.5 (1.8)	<0.0001	65.6 (7.9)	65.3 (5.5)	73.6 (7.4)	0.7241	63.1 (4.1)	67.7 (3.8)	77.2 (3.8)	0.0868
Marijuana use	63.0(1.3)	73.3(1.1)	89.4(1.4)	<0.0001	50.2(6.8)	70.3(6.3)	87.6(5.7)	0.0057	74.4(3.3)	78.4(3.4)	87.4(3.5)	0.0665
Non-medical prescription opioids	25.4 (1.1)	27.1 (1.0)	43.7 (1.6)	<0.0001	36.0 (6.4)	22.6 (4.9)	55.9 (8.2)	0.0020	32.8 (4.2)	28.9 (3.2)	45.5 (5.1)	0.0272
Heroin	1.1 (0.3)	9.8 (0.8)	10.5 (1.2)	<0.0001	0 (0.0)	3.7 (1.6)	6.8 (3.1)	–	0.9 (0.5)	10.2 (2.8)	11.7 (3.3)	0.0002

Note: Boldface indicates statistical significance ($p < 0.05$).

wt col %: weighted column percent.