

# Prevalence and Correlates of Prescription Drug Misuse Among a Racially Diverse Sample of Young Sexual Minority Men

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## Abstract

**Purpose:** Sexual minority men (SMM) are at greater risk than heterosexual men for misusing prescription psychotropic medications. However, community prevalence estimates of prescription drug misuse among young SMM are lacking. The current study described lifetime and past-6-month stimulant, painkiller, and depressant/tranquilizer misuse in a large, racially diverse sample of 967 SMM aged 16–29 in Chicago, Illinois, and investigated demographic and other substance use associations.

**Methods:** Data came from the baseline visit of the RADAR longitudinal cohort study. Associations were examined using bivariate and multivariable logistic regression.

**Results:** A quarter of the sample reported ever misusing any prescription drug, and 14.2% reported recent misuse. Lifetime class-specific misuse was 16.9% for stimulants, 11.0% for painkillers, and 11.4% for depressants/tranquilizers; recent misuse was 8.0%, 5.7%, and 6.2%, respectively. In multivariable analysis, Non-Hispanic black participants had lower odds of lifetime stimulant and depressant/tranquilizer misuse and recent stimulant misuse than non-Hispanic white participants, and bisexual participants had greater odds of lifetime and recent painkiller and depressant/tranquilizer misuse than gay participants. Generally, using other substances was associated with greater odds of prescription drug misuse. Having ever been prescribed a psychotropic medication was associated with higher odds of lifetime painkiller misuse after controlling for covariates.

**Conclusion:** These results provide critical information on a growing public health problem among young SMM. Future research should explore why differential rates of misuse exist across subgroups. New interventions emphasizing the risk of prescription drugs, discouraging drug sharing, and bolstering refusal and coping skills should be developed and evaluated.

**Keywords:** illicit drugs, painkillers, prescription drugs, sexual minority men, stimulants, substance use

## Introduction

NONMEDICAL USE OF psychotropic medications has become a significantly larger part of the substance use epidemic among adolescents and young adults in the United States, growing relative to other illicit drugs since the 1990s to become the second most prevalent type of illicit drug.<sup>1–3</sup> Nearly 1 in 5 of 12th grade students has ever misused a prescription drug,<sup>2</sup> and recent misuse is highest among those aged 18–25.<sup>1</sup> Among this latter group, prescription drugs are the leading cause of drug-related overdose deaths, the number of which quadrupled between 1999 and 2014.<sup>4</sup> For 21–24-year-olds, emergency department visits due to psychotropic medications more than doubled between

2004 and 2011.<sup>5</sup> Misuse at younger ages is also associated with increased likelihoods of using other illicit drugs and developing a substance use disorder.<sup>1,6</sup> However, the majority of high school youth perceive experimental and regular use of prescription drugs without medical supervision as low risk.<sup>2</sup>

Limited research suggests that some groups of male sexual minority youth may have elevated rates of prescription drug misuse.<sup>7–10</sup> However, prevalence estimates of the behavior among young sexual minority men (YSMM) are generally lacking. Early work on this topic was primarily conducted with adult SMM and sampled from Pride events or groups of current illicit substance users, limiting generalizability.<sup>11–14</sup> Among the small number of studies with youth, most combined different genders and/or sexual orientations<sup>8,9,15–17</sup> or

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sampled youth who were already regular misusers of prescription drugs,<sup>14,16,18</sup> precluding accurate estimates of general misuse specifically among YSMM.

Only two studies we identified examined male sexual minority youth separately from females. In a sample of adolescent males, those who reported having same-sex attraction and identified as gay, bisexual, or mostly heterosexual reported higher past-year prescription drug misuse (13.0%, 16.4%, and 11.4%, respectively) than those who were completely heterosexual-identified (6.0%), with significantly elevated risk for all three groups.<sup>7</sup> Similarly, in a nationally representative sample of high school students, 32.3% of gay-, 23.2% of bisexual-, and 27.2% of unsure-identified males reported ever misusing a prescription drug compared with 17.0% of heterosexually identified males.<sup>10</sup> However, neither study differentiated between classes of prescription drugs. A study of college freshmen did differentiate and found that 15.7% of the gay males misused any prescription drug and that 11.4%, 6.5%, and 8.1% misused stimulants, anxiolytics, and painkillers, respectively.<sup>9</sup> Bisexual and questioning individuals in that study were not separated by gender, and the sample comprised people enrolled in a private university; college-bound students have been shown to be less likely to misuse medications than those who are not.<sup>2</sup> Given the state of the literature, there is a need to disentangle males from females and YSMM from older SMM as well as to examine misuse of specific types of prescription drugs among more representative samples.

There is also a need to better understand subgroup differences in prescription drug misuse risk. Most evidence suggests that YSMM who do not identify as gay are at greater risk than gay-identified youth for misusing prescription drugs.<sup>7,9,17,18</sup> One study did not find elevated odds for bisexual high school students,<sup>10</sup> but this pattern is generally consistent with findings for other substances.<sup>19–21</sup> Nonwhite YSMM appear to be at lower risk than white YSMM for misusing prescription drugs,<sup>8,18</sup> which is also consistent with findings for other substances<sup>19,21</sup> and among general youth populations.<sup>1,2</sup> Nevertheless, these previous studies, including the only two that examined specific racial/ethnic subgroups, suffer from the same sampling and/or grouping limitations.<sup>9,17</sup>

The current study aimed to describe the prevalence of misuse of different classes of prescription drugs among YSMM in a large, racially diverse community sample. In addition, it sought to identify demographic differences and investigate associations with other substance use. We hypothesized that nongay-identified YSMM would have higher rates of prescription drug misuse relative to gay YSMM and that racial/ethnic minority YSMM would have lower rates relative to white YSMM. We also hypothesized that prescription drug misuse would be positively associated with other licit and illicit substance use.

## Methods

### Procedure

Data for the current analysis came from the baseline visit for RADAR, a longitudinal cohort study of HIV risk factors, drug and alcohol use, and relationship patterns among YSMM living in and around Chicago, Illinois. Individuals were eligible for enrollment if they were between 16 and 29 years old, were assigned male at birth, spoke English, and either reported

a sexual encounter with a man in the previous year or identified as gay or bisexual. Male-born participants from three previous cohorts, recruited from 2007–2008, 2010–2013, and 2015–2017 when they were 16–20 years old,<sup>22,23</sup> were provided with the opportunity to join RADAR. All three cohorts were recruited during their respective periods using respondent-driven sampling<sup>24</sup> and venue/online recruitment and, as such, represent a multiple cohort accelerated longitudinal design.<sup>25</sup> The RADAR sample was further enriched with self-identified serious partners of cohort members who met eligibility criteria. Baseline data collection for RADAR began in February 2015, and open enrollment concluded in April 2017, although to accomplish an aim related to assessing dyadic factors, new romantic partners who are eligible can continue to join the cohort.

Variables pertinent to the current analysis were collected via self-report surveys administered on computers in private interview rooms at a local lesbian, gay, bisexual, transgender, and queer community center. Participants provided written consent to participate in the study and received \$50 in compensation. For those aged 16 or 17 years, written assent was obtained, and parental/guardian consent was waived. This was a critical component of the assent procedure because of potential negative consequences of obtaining parental consent,<sup>26</sup> and we have successfully used this procedure in other studies of adolescent SMM.<sup>27</sup> All RADAR study activities were approved by the Institutional Review Board at Northwestern University.

### Measures

**Demographics.** To examine potential differences by developmental and legal factors, age was categorized into four groups: mid-teens (16–17), late teens/under legal drinking age (18–20), emerging adults (21–24), and young adults (25–29).<sup>5</sup> Race/ethnicity was collapsed into four categories: non-Hispanic white, non-Hispanic black, Hispanic/Latino, and non-Hispanic multiracial/other. Participants were asked to select from a list or specify their current gender identity. Transgender and other individuals who did not identify as a man were excluded from analysis ( $n=81$ , 7.7%). Participants were asked to specify their sexual orientation, which was trichotomized into gay-, bisexual-, and other-identified.

To assess socioeconomic hardship, the Urban Hardship Index<sup>28,29</sup> was calculated from 6 census-tract-level indicators from the American Community Survey 2010–2014 estimates for Cook County, Illinois: per capita income, percentage of persons younger than the age of 18 years or older than the age of 64 years, percentage of persons aged 25 or older without a high school diploma, percentage of households living below the federal poverty level, percentage of persons aged 16 years or older in the labor force who are unemployed, and percentage of occupied housing units with more than one person per room.<sup>30–35</sup> Census tracts with populations below the 1st percentile (i.e., below 891 people) were removed from analysis (14 out of 1319 tracts). Within each tract, a standardized score ranging from 0 to 100 was assigned to each indicator, with higher scores representing greater levels of hardship. Participants living in Cook County were assigned a mean score of the indicators, which ranged from 12.49 to 72.47 for this sample, from the census tract matching their self-reported address. Participants who did not report an address or lived outside Cook County were not assigned a score ( $n=79$ ).

**Prescription drug use.** Participants were provided with a description of prescription stimulants and asked if they had ever used any prescription stimulant in their lifetime and in the past 6 months. Those who responded affirmatively were asked to select which specific medications (i.e., Adderall, Concerta, Dexedrine, Ritalin, Vyvanse, and Other) they used. For each endorsement, participants indicated whether the medication was (a) prescribed by a healthcare provider, (b) taken without a prescription, or (c) both. Misuse was defined as any use without a prescription (i.e., [b] and [c]), and having a prescription was defined regardless of proper usage (i.e., [a] and [c]). For analysis, individual stimulants were collapsed together into use of any stimulant. The same questions were asked of prescription painkillers (Vicodin, Codeine, Percocet, Hydrocodone, Morphine, or OxyContin) and prescription depressants/tranquilizers (Ativan, Klonopin, Librium, Valium, or Xanax) as classes of drugs, and examples of each were provided.

**Other drug use.** Alcohol dependency was assessed using the Alcohol Use Disorders Identification Test (AUDIT), a 10-item scale with demonstrated psychometric properties that has previously been used with YSMM.<sup>36</sup> Sum scores were trichotomized into low (0–7), moderate (8–15), and high (16–40) alcohol dependence risk. Smoking status was measured with one item asking how many cigarettes participants smoked in their lifetime, with responses dichotomized between having smoked 100 or more versus fewer than 100 per the National Health Information Survey.<sup>37</sup> Lifetime e-cigarette use was measured using one item, with responses dichotomized to yes or no.

For illicit substances, participants were asked to select from a list any substances they had used in their lifetime and in the past 6 months, including marijuana, cocaine, heroin, methamphetamines, gamma-hydroxybutyric acid, ketamine, poppers, inhalants, hallucinogens, and ecstasy. Endorsement of any illicit drug other than marijuana was coded as nonmarijuana illicit drug use. Problematic cannabis use was assessed with 8 items from the Revised Cannabis Use Disorder Identification Test (CUDIT-R).<sup>38</sup> Sum scores were trichotomized into low (0–7), moderate (8–11), and high (12–32) cannabis dependence risk.

*Analysis*

The analytic sample of cisgender SMM aged 16–29 was 967. Bivariate and multivariable logistic regressions were used to examine the association between prescription drug misuse variables and having ever been prescribed a psychotropic medication, use of other substances (including the CUDIT-R in lieu of lifetime marijuana use), and demographic covariates. In the latter, all covariates were entered into the model simultaneously. All analyses were conducted with IBM SPSS Statistics, Version 23 (IBM Corporation, Armonk, NY). Missing data were omitted pairwise per specific analyses.

**Results**

*Descriptive statistics*

Table 1 presents demographic and lifetime nonprescription drug use descriptive statistics. Participants were racially/

TABLE 1. DESCRIPTIVE STATISTICS FOR YOUNG SEXUAL MINORITY MEN AGED 16–29 IN RADAR (N=967)

Variable	M (SD; min, max) or n (%)
Age	21.17 (2.93; 16.01, 29.97)
Developmental age groups	
16–17	106 (11.0)
18–20	451 (46.6)
21–24	304 (31.4)
25–29	106 (11.0)
Race/ethnicity	
Non-Hispanic white	249 (25.7)
Non-Hispanic black	315 (32.6)
Hispanic/Latino	297 (30.7)
Non-Hispanic multiracial/other	106 (11.0)
Sexual orientation	
Gay	702 (72.6)
Bisexual	212 (21.9)
Other	53 (5.5)
Socioeconomic hardship (n=885)	37.91 (13.09; 12.49, 72.47)
AUDIT	
Low risk	684 (70.7)
Moderate risk	227 (23.5)
High risk	56 (5.8)
Lifetime 100+ cigarette use	273 (28.2)
Lifetime e-cigarette use	417 (43.1)
Lifetime marijuana use (n=965)	792 (82.1)
CUDIT-R	
Low risk	633 (65.5)
Moderate risk	149 (15.4)
High risk	185 (19.1)
Lifetime nonmarijuana illicit drug use (n=965)	382 (39.5)

AUDIT, Alcohol Use Disorders Identification Test. CUDIT-R, Revised Cannabis Use Disorder Identification Test. Reduced denominators due to missing data are reported in parentheses next to corresponding variables.

ethnically diverse, primarily identified as gay, and were, on average, 21.2 years old (SD=2.9). Most were at low risk for alcohol and cannabis dependence, and the majority had never smoked 100+ cigarettes or used an e-cigarette or a non-marijuana illicit drug.

*Prevalence*

Lifetime and past-6-month prescription drug use are presented in Table 2. Use only without a prescription was more common than prescribed use for stimulants and depressants/tranquilizers but not painkillers. Misuse when prescribed (i.e., “both” in Table 2) was low relative to misuse only without a prescription for all three classes. Of participants reporting any prescription drug misuse, approximately a third (37.7% lifetime, 31.7% recent) misused more than one type (Fig. 1). Almost all participants who misused a prescription drug reported using at least one other illicit substance in the same time period, the majority (75.3% lifetime, 68.4% recent) reporting both marijuana and another illicit drug use (Fig. 2).

TABLE 2. FREQUENCY AND PREVALENCE OF LIFETIME AND PAST-6-MONTH PRESCRIPTION DRUG USE AMONG YOUNG SEXUAL MINORITY MEN AGED 16–29 IN RADAR (N=967)

Prescription drug	Used n (%)	With a prescription <sup>a</sup> n (%)	Without a prescription <sup>a</sup> n (%)	Both <sup>a</sup> n (%)	Had a prescription <sup>b</sup> n (%)	Misused <sup>c</sup> n (%)
<b>Lifetime</b>						
Stimulants (n=953)	236 (24.8)	75 (31.8)	137 (58.1)	24 (10.2)	99 (10.4)	161 (16.9)
Painkillers (n=962)	312 (32.4)	206 (66.0)	64 (20.5)	42 (13.5)	248 (25.8)	106 (11.0)
Depressants or tranquilizers (n=963)	161 (16.7)	59 (36.6)	104 (64.6)	6 (3.7)	65 (6.7)	110 (11.4)
Any prescription drug (n=952)	443 (46.5)				318 (33.4)	242 (25.4)
<b>Past 6 months</b>						
Stimulants (n=962)	111 (11.5)	34 (30.6)	71 (64.0)	6 (5.4)	40 (4.2)	77 (8.0)
Painkillers (n=964)	140 (14.5)	85 (60.7)	43 (30.7)	12 (8.6)	97 (10.1)	55 (5.7)
Depressants or tranquilizers (n=965)	98 (10.2)	38 (38.8)	57 (58.2)	3 (3.1)	41 (4.2)	60 (6.2)
Any prescription drug (n=957)	261 (27.3)				158 (16.5)	136 (14.2)

Cases with missing data were removed listwise for these estimates.

<sup>a</sup>Percentages are out of those who reported using that type of prescription drug (“Used”).

<sup>b</sup>Sum of “With a prescription” and “Both.” Percentages are out of the sample with nonmissing data (n in the “Prescription drug” column).

<sup>c</sup>Sum of “Without a prescription” and “Both.” Percentages are out of the sample with nonmissing data (n in the “Prescription drug” column).

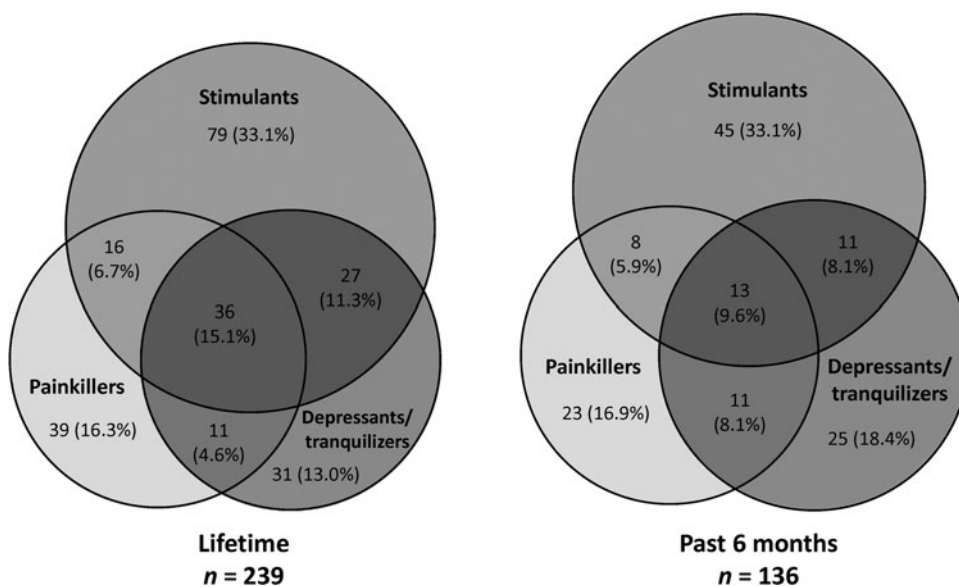
### Correlates

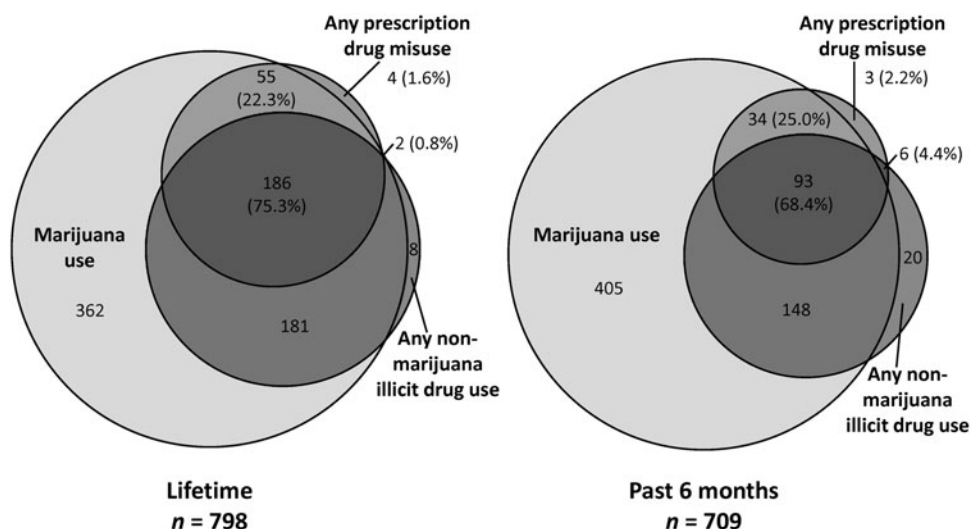
Table 3 presents bivariate associations between prescription drug misuse and demographic and substance use variables. Using other substances was consistently associated with misusing all types of prescription drugs. Compared with those aged 16–17, YSMM aged 18–20 had significantly greater odds of ever misusing stimulants, but the effect was not maintained for recent misuse. There was a trend among racial/ethnic minority YSMM toward lower odds of lifetime and recent misuse than white YSMM, with the lowest odds among black YSMM. Bisexual participants had significantly elevated odds of lifetime and recent painkiller and depressant/tranquilizer misuse; in contrast, other-identified participants had significantly greater odds of recent stimulant misuse. Greater socioeconomic hardship was associated with marginally lower odds of lifetime and recent stimulant and lifetime depressant/tranquilizer misuse, and ever having a prescription

for the drug was significant for lifetime stimulant and lifetime and recent painkiller misuse.

When adjusting for covariates (Table 4), using other drugs generally remained associated with greater odds of lifetime and recent prescription drug misuse, with high-risk alcohol and cannabis dependence and other illicit drug use maintaining the strongest effects. Socioeconomic hardship and racial/ethnic effects attenuated to nonsignificance, except among black YSMM for lifetime and recent stimulant misuse and lifetime depressant/tranquilizer misuse. In contrast, previously significant sexual orientation effects increased in magnitude. Ever having a prescription maintained significantly elevated odds only for lifetime painkiller misuse. Almost uniformly, the age effects shifted from greater to lower odds; supplementary analyses showed no multicollinearity among the covariates and attributed the valence change to substance use covariates, suggesting a relationship between age and other substance use.

FIG. 1. Overlap of prescription drugs used among young sexual minority men aged 16–29 in RADAR who reported misusing any prescription drug in their lifetime and in the past 6 months. Counts include only participants with nonmissing data on all variables. Percentages do not add to exactly 100% because of rounding. Created using BioVenn.<sup>51</sup>





**FIG. 2.** Overlap of illicit drugs used among young sexual minority men aged 16–29 in RADAR who reported using/misusing any illicit substance in their lifetime and in the past 6 months. Counts include only participants with nonmissing data on all variables. Created using BioVenn.<sup>51</sup>

## Discussion

One quarter of RADAR participants reported ever misusing a prescription drug. Few studies with comparable age groups and time periods are available in the literature, but in supplementary analyses, 14.2% of 16–17-year-olds and 27.9% of 18–20-year-olds in our sample reported any lifetime misuse; comparable estimates are available among U.S. high school students (16.8%)<sup>39</sup> and 12th graders (18.3%).<sup>2</sup> By drug type, our estimates for lifetime stimulant (16.9%), painkiller (11.0%), and depressant/tranquilizer (11.4%) misuse appear comparable to estimates of amphetamine, nonheroin narcotic, and tranquilizer misuse among general samples of college students (13.9%, 6.6%, and 7.8%, respectively) and young adults aged 19–28 (18.8%, 15.0%, and 12.8%, respectively).<sup>40</sup> In contrast, our estimates are substantially lower than those reported by Rosario et al.,<sup>8</sup> who found that 33.7% of lesbian/gay and 50.6% of bisexual 17–25-year-olds had ever misused a prescription drug. The difference may be due, in part, to their having a smaller sample ( $n = 181$ ); using attraction rather than behavior or identity to operationalize sexual orientation<sup>21</sup>; and including sexual minority females, who appear to be at greater risk for prescription drug misuse than males.<sup>7,9</sup> Their sample also had higher proportions of other substance use in general.

Stimulants were the most commonly misused prescription drug in our sample, while painkiller and depressants/tranquilizer misuse were about equal, matching reports among general and sexual minority youth and young adults.<sup>2,9,40</sup> Among some samples of adult SMM (up to 65 years old) and drug-using YSMM, however, painkillers have been found to be the most prevalent misused prescription drug, followed by tranquilizers, and other sedatives.<sup>11,13,14,18</sup> Kelly and Parsons reported a small but significant decrease in the odds of prescription stimulant misuse associated with age.<sup>14</sup> Thus, stimulants may play a larger role in patterns of prescription drug misuse among YSMM and general young people that diminish over time.

Our regression results suggest that black YSMM are less likely than white YSMM to misuse prescription drugs, a consistent finding among adult SMM,<sup>11,12,14</sup> high-risk YSMM,<sup>18</sup> and general youth.<sup>2,41</sup> Kecojec et al. reported that among

prescription-drug-using YSMM, nonwhite individuals were significantly less likely to misuse stimulants and tranquilizers in the past 6 months than white individuals; the difference in opioid misuse was nonsignificant.<sup>18</sup> In our multivariable analyses, we found the same pattern among black participants for lifetime misuse and a similar pattern for recent misuse. Some studies have examined psychosocial and environmental factors that may contribute to lower misuse, such as attitudes, religiosity, college enrollment, and community engagement,<sup>41–43</sup> but research in this area is limited.

Compared to gay-identified participants, bisexual-identified YSMM in our sample had significantly greater odds of lifetime and recent painkiller and depressant/tranquilizer misuse, whereas other nongay-identified individuals had greater odds of recent stimulant misuse, and the magnitude of the effects increased after adjusting for covariates. These findings are consistent with prior work demonstrating that nongay-identified YSMM tend to have greater risk for various negative health behaviors and outcomes, including prescription drug misuse.<sup>7,9,17,18,44</sup> Bisexual adults experience greater mental health, social, and financial problems; less support; and more stigma than heterosexual and homosexual adults as well as additional bisexual-specific stigma from those other groups.<sup>44,45</sup> Considering that coping and stress management are common motives for misusing opioids and tranquilizers among YSMM,<sup>46</sup> bisexual participants in RADAR may turn to such substances to self-medicate. The elevated odds of recent stimulant misuse among other-identified participants is a novel finding, and further research is needed to understand how and why this group differs from gay and bisexual YSMM.

Most YSMM in our sample who misused any prescription drug never had a prescription, and having had a prescription was not associated with greater odds of misuse, except for lifetime painkillers. Among general adolescents who used amphetamines and tranquilizers in the past year, fewer than 15% indicated their own prescription as a source; peers are by far the most commonly reported source of all three classes of prescription drugs.<sup>2</sup> Kecojec et al. reported that the age of first prescribed drug was the most significant predictor of initiation into misuse for all three types of drugs,<sup>15</sup> but the current findings indicate that having a prescription is not a

TABLE 3. UNADJUSTED ODDS RATIOS (95% CONFIDENCE INTERVALS) FOR CORRELATES OF LIFETIME AND PAST-6-MONTH PRESCRIPTION DRUG MISUSE AMONG YOUNG SEXUAL MINORITY MEN AGED 16-29 IN RADAR (N = 967)

	Lifetime			Past 6 months		
	Stimulants	Painkillers	Depressants or tranquilizers	Stimulants	Painkillers	Depressants or tranquilizers
Age (Ref = 16-17)						
18-20	<b>2.68</b> (1.30-5.50)	2.28 (0.95-5.45)	1.85 (0.86-4.01)	2.20 (0.85-5.69)	0.98 (0.39-2.46)	1.40 (0.53-3.69)
21-24	2.06 (0.98-4.37)	2.11 (0.86-5.17)	1.39 (0.62-3.13)	1.51 (0.56-4.11)	0.87 (0.33-2.30)	1.35 (0.49-3.70)
25-29	1.70 (0.70-4.12)	2.17 (0.78-6.03)	1.60 (0.63-4.09)	1.43 (0.44-4.65)	1.55 (0.53-4.51)	1.43 (0.44-4.65)
Race/ethnicity (Ref = Non-Hispanic white)						
Non-Hispanic black	<b>0.06</b> (0.03-0.13)	<b>0.46</b> (0.27-0.80)	<b>0.18</b> (0.09-0.35)	<b>0.05</b> (0.02-0.16)	0.61 (0.28-1.33)	<b>0.30</b> (0.14-0.67)
Hispanic/Latino	<b>0.66</b> (0.44-0.97)	0.81 (0.49-1.33)	0.77 (0.49-1.22)	<b>0.51</b> (0.31-0.87)	1.24 (0.63-2.45)	0.87 (0.47-1.59)
Non-Hispanic multiracial/other	<b>0.49</b> (0.27-0.87)	0.68 (0.33-1.38)	<b>0.47</b> (0.23-0.97)	<b>0.36</b> (0.16-0.84)	0.93 (0.35-2.46)	0.62 (0.24-1.57)
Sexual orientation (Ref = Gay)						
Bisexual	0.73 (0.47-1.14)	<b>1.89</b> (1.21-2.96)	<b>1.66</b> (1.06-2.59)	1.01 (0.57-1.81)	<b>2.92</b> (1.64-5.18)	<b>2.40</b> (1.38-4.18)
Other	1.38 (0.71-2.71)	1.76 (0.79-3.89)	1.40 (0.61-3.22)	<b>2.54</b> (1.17-5.48)	1.96 (0.66-5.80)	1.20 (0.36-4.06)
Socioeconomic hardship	<b>0.96</b> (0.95-0.98)	1.00 (0.98-1.01)	<b>0.97</b> (0.96-0.99)	<b>0.96</b> (0.94-0.98)	1.00 (0.98-1.02)	0.98 (0.96-1.00)
Ever prescribed	<b>1.68</b> (1.02-2.75)	<b>2.07</b> (1.36-3.15)	0.78 (0.33-1.84)	1.86 (0.99-3.52)	<b>1.85</b> (1.05-3.25)	1.28 (0.49-3.31)
Alcohol dependence risk (Ref = Low risk)						
Moderate risk	<b>2.97</b> (2.02-4.36)	<b>2.85</b> (1.80-4.53)	<b>2.47</b> (1.55-3.94)	<b>4.29</b> (2.52-7.29)	<b>3.07</b> (1.68-5.62)	<b>4.29</b> (2.34-7.84)
High risk	<b>9.20</b> (5.14-16.47)	<b>9.84</b> (5.33-18.14)	<b>13.49</b> (7.39-24.62)	<b>9.94</b> (4.95-19.97)	<b>6.22</b> (2.79-13.85)	<b>11.32</b> (5.34-24.02)
Lifetime 100+ cigarettes	<b>2.59</b> (1.83-3.68)	<b>4.01</b> (2.65-6.07)	<b>3.65</b> (2.43-5.48)	<b>2.03</b> (1.26-3.26)	<b>3.31</b> (1.91-5.74)	<b>3.67</b> (2.15-6.24)
Lifetime e-cigarette use	<b>3.95</b> (2.73-5.69)	<b>3.53</b> (2.28-5.46)	<b>5.44</b> (3.41-8.68)	<b>3.42</b> (2.06-5.68)	<b>2.65</b> (1.50-4.69)	<b>5.86</b> (3.07-11.19)
Cannabis dependence risk (Ref = Low risk)						
Moderate risk	<b>2.35</b> (1.51-3.68)	<b>2.49</b> (1.42-4.37)	<b>3.98</b> (2.39-6.64)	<b>3.42</b> (1.84-6.37)	<b>3.27</b> (1.47-7.28)	<b>3.85</b> (1.89-7.83)
High risk	<b>2.79</b> (1.86-4.19)	<b>5.09</b> (3.20-8.10)	<b>4.21</b> (2.61-6.78)	<b>4.89</b> (2.83-8.45)	<b>7.68</b> (4.02-14.69)	<b>5.83</b> (3.13-10.85)
Lifetime nonmarijuana illicit drug use	<b>10.28</b> (6.69-15.80)	<b>6.01</b> (3.75-9.61)	<b>12.62</b> (7.19-22.16)	<b>12.32</b> (6.25-24.29)	<b>6.77</b> (3.45-13.28)	<b>11.40</b> (5.35-24.28)

Bold indicates  $P < 0.05$ .

TABLE 4. ADJUSTED ODDS RATIOS (95% CONFIDENCE INTERVALS) FOR CORRELATES OF LIFETIME AND PAST-6-MONTH PRESCRIPTION DRUG MISUSE AMONG YOUNG SEXUAL MINORITY MEN AGED 16-29 IN RADAR (N=967)

	Lifetime				Past 6 months				
	Stimulants	Painkillers	Depressants or tranquilizers	Stimulants	Painkillers	Depressants or tranquilizers	Stimulants	Painkillers	Depressants or tranquilizers
Age (Ref = 16-17)									
18-20	0.76 (0.31-1.83)	1.19 (0.43-3.30)	0.55 (0.21-1.47)	0.61 (0.20-1.92)	0.48 (0.16-1.42)	0.46 (0.13-1.57)			
21-24	0.65 (0.26-1.63)	0.99 (0.35-2.82)	0.44 (0.16-1.23)	0.63 (0.20-2.03)	0.37 (0.12-1.18)	0.57 (0.17-1.96)			
25-29	0.51 (0.17-1.55)	0.93 (0.28-3.12)	0.56 (0.17-1.88)	0.68 (0.17-2.74)	0.73 (0.20-2.67)	0.58 (0.14-2.48)			
Race/ethnicity (Ref = Non-Hispanic white)									
Non-Hispanic black	<b>0.14</b> (0.06-0.33)	0.80 (0.37-1.74)	<b>0.28</b> (0.11-0.69)	<b>0.09</b> (0.02-0.37)	0.73 (0.25-2.09)	0.45 (0.15-1.33)			
Hispanic/Latino	0.64 (0.37-1.10)	0.97 (0.51-1.88)	0.78 (0.41-1.50)	0.62 (0.31-1.25)	1.18 (0.50-2.78)	0.81 (0.36-1.82)			
Non-Hispanic multiracial/other	0.66 (0.33-1.35)	1.21 (0.52-2.80)	0.58 (0.24-1.42)	0.58 (0.22-1.51)	1.40 (0.46-4.29)	0.72 (0.23-2.25)			
Sexual orientation (Ref = Gay)									
Bisexual	0.76 (0.42-1.38)	<b>1.97</b> (1.14-3.39)	<b>2.29</b> (1.25-4.19)	1.45 (0.70-3.00)	<b>2.94</b> (1.49-5.79)	<b>2.94</b> (1.47-5.89)			
Other	1.16 (0.51-2.67)	1.74 (0.70-4.37)	1.23 (0.45-3.34)	<b>2.72</b> (1.06-6.95)	1.93 (0.58-6.44)	1.03 (0.27-3.99)			
Socioeconomic hardship	0.99 (0.97-1.01)	1.01 (0.99-1.03)	0.98 (0.96-1.01)	0.99 (0.96-1.01)	1.01 (0.98-1.03)	1.00 (0.97-1.02)			
Ever prescribed	0.89 (0.47-1.69)	<b>1.73</b> (1.04-2.86)	0.45 (0.16-1.22)	0.99 (0.44-2.24)	1.50 (0.77-2.88)	0.93 (0.31-2.75)			
Alcohol dependence risk (Ref = Low risk)									
Moderate risk	<b>1.75</b> (1.09-2.81)	<b>1.72</b> (1.01-2.94)	1.30 (0.74-2.29)	<b>2.90</b> (1.55-5.41)	1.77 (0.88-3.57)	<b>2.19</b> (1.09-4.42)			
High risk	<b>4.43</b> (2.09-9.40)	<b>5.72</b> (2.77-11.81)	<b>7.80</b> (3.57-17.04)	<b>5.28</b> (2.21-12.62)	<b>3.17</b> (1.24-8.08)	<b>5.44</b> (2.24-13.20)			
Lifetime 100+ cigarettes	1.31 (0.79-2.16)	<b>1.78</b> (1.04-3.02)	1.68 (0.96-2.95)	0.64 (0.33-1.23)	1.31 (0.65-2.63)	1.26 (0.64-2.51)			
Lifetime e-cigarette use	<b>1.76</b> (1.08-2.85)	1.59 (0.93-2.71)	<b>2.02</b> (1.12-3.63)	1.49 (0.78-2.83)	1.08 (0.54-2.18)	<b>2.54</b> (1.18-5.47)			
Cannabis dependence risk (Ref = Low risk)									
Moderate risk	1.63 (0.90-2.95)	1.16 (0.60-2.27)	<b>2.14</b> (1.10-4.16)	2.11 (0.99-4.51)	1.65 (0.67-4.07)	1.82 (0.80-4.16)			
High risk	<b>1.85</b> (1.07-3.19)	<b>2.50</b> (1.43-4.38)	<b>2.35</b> (1.27-4.34)	<b>3.83</b> (1.92-7.64)	<b>4.14</b> (1.97-8.69)	<b>2.66</b> (1.27-5.58)			
Lifetime nonmarijuana illicit drug use	<b>5.84</b> (3.38-10.08)	<b>2.68</b> (1.50-4.79)	<b>5.24</b> (2.67-10.27)	<b>5.02</b> (2.24-11.26)	<b>4.06</b> (1.75-9.45)	<b>4.85</b> (1.95-12.06)			

Bold indicates  $P < 0.05$ .

strong determinant in light of other factors. Although misuse of prescriptions should still be of concern for clinicians among a small minority of young patients, public health prevention interventions should aim to bolster skills around resisting peer pressure to use prescription drugs and to discourage medication sharing among those with prescriptions. Future studies should examine the trajectories of prescription drug use among individuals prescribed such medications to explore factors that may differentiate those who adhere to the prescription from those who misuse.

Finally, consistent with adult SMM and general youth literature,<sup>11,42</sup> use of other substances was associated with prescription drug misuse, with high alcohol dependence risk and lifetime nonmarijuana illicit drug use having the strongest effects. Most participants who misused prescription drugs also used marijuana and a nonmarijuana illicit drug in the same time period. In a study of young adults aged 18–29 involved in nightlife scenes, over 90% of prescription drug misusers reported also using other illicit drugs, and 66% used prescription drugs in combination with at least one other illicit substance.<sup>16</sup> Sexual minority youth in that sample had significantly greater odds than heterosexuals of combining prescription drugs with cocaine, ecstasy, or another psychedelic drug, an important concern because of the compounded acute effects and potentially serious, even fatal, negative drug interactions. Public health interventions should directly address polysubstance use, which is a prevalent practice in some SMM subcultures such as circuit parties.<sup>46</sup>

### Limitations

First, the cross-sectional design prevents the drawing of causal inferences. Second, our static measures of lifetime and recent misuse eschew understandings of developmental trends, and we were unable to examine hypothetical mediators such as mental health. Third, our definition of misuse included use both with and without a prescription but did not specifically distinguish use with a prescription but not as prescribed. It is possible that some participants using the drugs not as prescribed may have self-classified as only using with a prescription. Fourth, approximately 14% and 19% of the sample were recruited through partner and peer recruitment, respectively, and we did not account for this dependence in our analysis; however, sensitivity analyses excluding these individuals found the same results. Fifth, the sample was regional and drawn from the community, possibly limiting generalizability. However, this limitation is mitigated by the robustness of the sampling approach, which can reach populations often missed by convenience sampling.<sup>24</sup> As large, representative studies of YSMM are generally absent in the literature, our diverse community sample provides critical information on a growing public health problem.

A general limitation of the literature in this area is that the operationalization of prescription drugs is inconsistent. While most studies have similar groupings for stimulants and painkillers, others distinguish sedatives from anxiolytics or separate sleep aids and muscle relaxants. Furthermore, specific drugs named within each category vary and may change over time as new medications enter the market, and the time period of use (e.g., within the past year, past 6 months) may

also differ. These variations in construct definitions limit comparisons that can be made across studies. Future research would greatly benefit from more standardized measures of prescription drugs.

### Conclusion

Prescription drug misuse is concerning among youth in the United States, and evidence from this study supports the fact that this problem exists equally among YSMM. The current analysis contributes to the literature by providing estimates from a large, racially diverse sample of YSMM. Limited research has been done on racial/ethnic differences, and the sample size allows this study to provide estimates for more clearly defined racial/ethnic categories. This study is also one of only a few that focuses exclusively on males sampled from the general community as opposed to college campuses, gay pride events, and high-risk environments, which would be more likely impacted by selection bias. Clear gender differences in prescription drug use necessitates that male and female sexual minority youth are not pooled together in future analyses.<sup>7,9,13</sup>

More research is needed to unpack why rates of prescription drug misuse are lower among black and higher among bisexual and other-identified YSMM. Because the vast majority of YSMM who misused reported never having a prescription, future work should continue to examine and target factors around how these substances are obtained. Given the pervasive belief among youth that misusing prescription drugs is low risk,<sup>2</sup> prevention programs for youth should emphasize dispelling such beliefs and not only develop individual drug resistance skills but also target the sharing of medications with peers.<sup>47</sup> Furthermore, interventions that address polysubstance use should continue to be developed and tested. A review of psychosocial interventions for substance abuse reported that family therapy is a “promising” intervention for polydrug users and that family interventions, community reinforcement, and contingency management approaches are more effective than counseling and 12-step programs.<sup>48</sup> However, parental rejection of sexual minority identities is still common,<sup>49,50</sup> so alternative strategies may be needed. For YSMM who identify as bisexual, more skills around coping may be appropriate to avoid coping through medication misuse.<sup>48</sup> Additional contexts surrounding prescription drug misuse specific to sexual minority youth should continue to be explored to further our understanding of this issue, with the goal of reducing health disparities between sexual minorities and their heterosexual peers.

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