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Co-occurring mental health and drug use experiences among Black and Hispanic/Latino sexual and gender diverse individuals

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Abstract
Black and Hispanic/Latino sexual and gender diverse individuals disproportionately experience overlapping health disparities, such as drug use and elevated depressive symptoms, which are often driven by minority stressors. We sought to better understand the interaction between drug use and mental health, as it may be fruitful in developing effective interventions to address co-occurring health disparities. In a longitudinal, 5-wave sample of 300 Black and Hispanic/Latino sexual and gender diverse (SGD) individuals collected between March 2020 and March 2022, we found a within-person association between greater than average levels of psychological distress (depression and anxiety) and more frequent extra-medical use of cannabis, inhalants, methamphetamines, and opioids over the span of two years. These associations held after adjusting for the direct, within-person association of internalized homonegativity with drug use frequency. These results suggest that psychological distress explains at least some variance in drug use among Black and Hispanic/Latino SGD individuals. This highlights the importance of interventions that focus on mental health among Black and Hispanic/Latino SGD individuals who report drug use.

Keywords Drug use · Mental health · Psychological distress · Marginalized populations

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Introduction

It is well-established that psychological distress, including depression and anxiety, is associated with an elevated risk of drug use disorder (Neicun et al., 2020; Swendsen et al., 2011). Reasons for this co-morbid link include drug use to cope with mental health challenges (Khantzian, 1997; Thornton et al., 2012; Turner et al., 2018), for example, the stigma that is frequently associated with depression (Wang et al., 2018). Furthermore, individuals with psychological distress may also report drug use for pleasure or social reasons (Thornton et al., 2012). Drug use to cope with psychological distress (e.g., self-medication) may be consequential for health and wellbeing as this behavior is associated with a greater likelihood of developing a persistent substance use disorder (Turner et al., 2018).

Due in part to sexual, gender, and racial stressors, Black and Hispanic/Latino sexual diverse individuals are at elevated risk for both drug use and psychological distress (Bowleg, 2013; Meyer et al., 2003). Intersectional stigma—in particular—is associated with greater depression and drug use over time among sexual diverse men and youth of color broadly (English et al., 2018; Mallory & Russell, 2021), and among Black young sexual diverse men (English et al., 2022). Internalized homonegativity, or the adoption of negative societal views about one's sexual identity (Meyer, 1995), is widely associated with elevated drug use (Drazdowski et al., 2016; Slater et al., 2017a, b; Quinn et al., 2015) and poorer mental health (Amola & Grimmett, 2015; DiGuiseppi et al., 2022; Wade et al., 2021).

Prior research has demonstrated mixed findings with respect to the co-occurrence of mental health and drug use disparities among Black and Hispanic/Latino sexual and gender diverse individuals (SGD) and their same-race heterosexual and White SGD counterparts (Burns et al., 2015; Edelman et al., 2020; Mereish & Bradford, 2014; Platt & Scheitle, 2018; Schuler et al., 2020). Although prior research has established a link between co-occurring psychological distress and drug use among sexually diverse men (Bränström & Pachankis, 2018; Earnshaw et al., 2020; Felner et al., 2021; Kecojevic et al., 2015; Kelly et al., 2021; Lee et al., 2015; Skeer et al., 2012), little research to date has examined the co-occurrence of psychological distress and drug use among Black and Hispanic/Hispanic/Latino sexual diverse men. In one study, Black and Hispanic/Latino adults were more likely than White adults to report co-occurring suicidality and cannabis use disorder (Kelly et al., 2021). Additionally, among a majority Black and Hispanic/Latino sample of sexual diverse men with HIV, greater depressive symptoms were positively associated with the number of drugs used at moderate or high risk (Earnshaw et al., 2020). Examining the links between psychological distress and drug use from longitudinal perspectives is important to develop and implement effective interventions to address these intersecting health disparities.

Compared to heterosexual cisgender men, sexual diverse cisgender men report greater use of a variety of drugs including tobacco and cannabis (Krueger et al., 2020; Schuler et al., 2018; Jun et al., 2019), in particular Black and Hispanic/Latino sexual diverse men (Rodriguez-Seijas et al., 2019). However, other research finds no difference in drug use between sexual diverse and heterosexual men of color (Mereish & Bradford, 2014). Sexual diverse men also report poorer mental health outcomes compared to heterosexual men (Krueger et al., 2018). However, like drug use, there is mixed evidence with regards to mental health disparities between Black and Hispanic sexual diverse men and their White sexual diverse and same-race heterosexual peers. For example, Black and Hispanic sexual diverse men report greater past 30-day psychological distress compared to White sexual diverse men (Platt & Scheitle, 2018). In another study, however, relative to White sexual diverse men, Black sexual diverse men were less likely to report major depressive episodes (Burns et al., 2015).

The current study

Research that examines drug use and mental health disparities, and the co-occurrence of these two experiences, is disproportionately studied among Black and Hispanic/Latino SGD individuals, and is typically cross-sectional in nature. Despite the known link between minority stressors (e.g., internalized homonegativity) and poor health outcomes, extant work is slow to consider the role that internalized homonegativity might play in the co-occurrence of drug use and psychological distress. Because a within-person design can focus on an individuals' distress experiences compared to their typical psychosocial functioning (opposed to between-person designs which focus on the processes for individuals with elevated levels of distress compared to other individuals with lower levels of distress), results from a study focused on within-person changes over time can help guide intervention efforts among Black and Hispanic/Latino individuals to address co-occurring experiences of drug use and mental health problems.

The purpose of the current study was first to assess whether changes in psychological distress were associated with changes in drug use among sample of Black and Hispanic/Latino SGD individuals across a two-year period. We hypothesized that within-person increases in psychological distress would be associated with within-person increases in drug use. A secondary aim of this study was to examine whether the relation between psychological distress and drug use persisted above and beyond internalized

homonegativity. Based on prior research, we hypothesized that internalized homonegativity would be positively associated with both psychological distress and drug use over time.

Method

Data for this analysis come from five survey waves of the *PrEP and Substance Use National Survey*, an online survey assessment of Black and/or Hispanic/Latino SGD individual's sexual health history and overall health experiences. All study protocols, including permission to recontact participants for follow-up surveys 2–5, were approved by the University of Connecticut Institutional Review Board. For more detailed information about study procedures, see Watson and colleagues (2022).

In March-August of 2020, we conducted a baseline survey (survey 1) to broadly assess drug use, mental health, and other health behaviors among Black and Hispanic/Latino SGD individuals. To participate in the run-in baseline survey, respondents were required to: (1) identify as Black and/or Hispanic/Latino, (2) be 18–29 years of age, (3) be assigned male at birth, (4) reside in the United States, and (5) have reported anal intercourse with a man in the past 12 months. Black and Hispanic/Latino SGD individuals were recruited from national networks, several large mailing lists, and social media (e.g., Twitter, Facebook, and Instagram) with the assistance of the Human Rights Campaign's wide-reaching network of community partners. The research team connected with local community-based organizations, health departments, and other health centers to advertise the survey. For their participation in the baseline survey, participants were provided a $15 Amazon gift card. In total, 992 participants responded to the baseline survey.

We employed longitudinal methodologies to follow a subset of participants taken from the run-in baseline survey (surveys 2–5). Of the 992 participants who completed the run-in baseline survey, 300 consented to participate in 4 additional survey waves (surveys 2–5) that were administered every 4 months. The first survey of the longitudinal portion (i.e., survey 2), was completed between February-March 2021 (n = 300). The second longitudinal survey (i.e., survey 3) was completed between July-August 2021—retention was n = 290/300. The third longitudinal survey (i.e., survey 4) was collected between October-November 2021, n = 287/300 were retained. Last, the fourth longitudinal survey (i.e., survey 5) was completed between March-April 2022, with n = 291/300 retained. Participants were remunerated $25, $30, $35, and $40 gift cards to Amazon or Venmo (cash) payments for participation in second, third, fourth, and fifth surveys, respectively. If participants completed all 4 surveys, they were provided a $20 bonus payment.

Measures

Drug use Drug use was initially assessed by asking participants whether they had ever, even once, used any drug in a way not prescribed by their doctor. Those who reported an affirmative answer to this question then proceeded to answer a series of follow-up questions for individual drugs. These drugs included: cannabis (marijuana, pot, grass hash, etc.), cocaine (coke, crack, etc.), stimulants (Ritalin®, Concerta®, etc.), methamphetamines (speed, crystal meth, ice, etc.), inhalants (nitrous oxide, poppers, glue, gas, paint thinner, etc.), sedatives or sleeping pills (Valium®, Serepax®, Ativan®, Librium®, Xanax®, Rohypnol, GHB, etc.), hallucinogens (LSD, acid, mushrooms, PCP, Special K, ecstasy, etc.), street opioids (heroin, opium, etc.) and opioids (fentanyl, oxycodone, hydrocodone, methadone, etc.), and medications to promote sexual function (Viagra). For each of these drugs, following the PhenX toolkit measures, participants were asked frequency of use in the past three months at each study visit on a five-point scale: 0 (never), 2 (once or twice), 3 (monthly), 4 (weekly), and 6 (daily or almost daily).

Mental health To assess psychological distress, we used the ultra-brief, validated version of the Patient Health Questionnaire (PHQ), the PHQ-4 (Kroenke et al., 2009). On a 4-point scale: 1 (not at all), 2 (several days), 3 (more than half the days), and 4 (nearly every day), participants rated how often in the prior two weeks they were bothered be the following four problems: (1) feelings of nervousness, anxiousness, or feeling on edge; (2) not being able to stop or control worrying; (3) feeling down, depressed, or hopeless; and (4) little interest or pleasure in doing things. Items for this scale were summed for each participant at each visit with the possible range of scores being 0–12 and operationalized as a continuous variable. Scores can be interpreted in the following way: normal (0–2), mild (3–5), moderate (6–8), and severe (9–12). Cronbach α for surveys 1–5 were as follows: 1 = 0.88, 2 = 0.88, 3 = 0.88, 4 = 0.89, 5 = 0.90.

Internalized homonegativity was assessed using a scale of nine items (see Meyer, 1995). These were each assessed on a scale from 0 (never) to 3 (often) and included items such as avoidance of personal or social environments, feelings of rejection, forced attraction to the opposite sex, among others. One item was reverse coded, "You have felt that being [sexual orientation] has allowed you to express a natural part of your sexual identity." Each of nine items were averaged together, with higher scores indicating more

frequent reports of internalized homonegativity. Cronbach α for surveys 1–5 were as follows: 1 = 0.85, 2 = 0.85, 3 = 0.85, 4 = 0.85, 5 = 0.95.

Race and ethnicity Participants reported their race from the following options, including selecting multiple options: "American Indian or Alaska Native", "Asian", "Black or African American", "Native Hawaiian or other Pacific Islander", "White", and "None of these". Participants also reported whether they identified as being Hispanic/Latino. Given the low percentages of some racial identities, we combined race and ethnicity into a single variable, operationalized as non-Hispanic Black, Hispanic, or a non-Hispanic different identity (e.g., multiracial, biracial, etc.).

Sexual orientation Participants reported their sexual identity from the following options: "gay, same gender loving", "bisexual", "heterosexual or straight", "pansexual", "queer", "not sure or questioning" or "other". For purposes of this analyses, this variable was recoded as gay, bisexual, and those identifying with a different sexual identity (e.g., heterosexual, pansexual, queer, etc.). Participants were combined into one "different sexual identity" group due to small cell sizes – this combined group only represented 7% of the overall sample.

Gender identity Participants reported their gender from the following options, "agender", "genderfluid", "genderqueer", "non-binary", "man", "transgender woman", or "something else". We dichotomized this variable to categorize cisgender participants ("cisgender") and "transgender" participants (those who selected a transgender/non-binary identity; e.g., agender, non-binary).

Table 1 Baseline demographic characteristics among sample participants (N = 300)

Characteristic	n (%)	Mean (SD)
Age	–	25.5 (2.7)
Race and Ethnicity		
Non-Hispanic Black	101 (33.7)	–
Hispanic	198 (66.0)	–
Black, Non-Hispanic Different Identity	1 (0.3)	–
Sexual Identity		
Gay	246 (82.0)	–
Bisexual	33 (11.0)	–
Different Identity	21 (7.0)	–
Gender Identity		
Cisgender	288 (96.0)	–
Gender Diverse	12 (4.0)	–
Mental Health		
Depression/Anxiety	–	4.0 (3.2)
Internalized Homonegativity	–	6.9 (5.8)

Analyses

Statistical analyses Participant characteristics were described using means, standard deviations, and proportions. Mixed effects linear longitudinal models were used to examine: (1) the association between psychological distress and frequency of use of each individual drug (e.g., frequency of cannabis use in one model, frequency of inhalants in the next model, etc.); and (2) the association between psychological distress—controlling for internalized homonegativity—and frequency of use of each individual drug. Model parameters included maximum likelihood estimation, autoregressive residuals to account for previous timepoints, and random intercepts at the individual level. No random slopes were specified. All models were adjusted for demographic characteristics (i.e., age, gender identity, race/ethnicity, sexual orientation, survey number). Statistical significance was established at $p < 0.05$. All analyses were performed in Stata 17.0.

Results

At baseline (Table 1), the mean age of the sample (n = 300) was 25.5 years (standard deviation [SD] = 2.7). In total, 101 (33.7%) participants identified as non-Hispanic Black, 198 (66.0%) identified as Hispanic/Latino, and 1 (0.3%) identified as a non-Hispanic different race or ethnicity. For sexual identity, 246 (82.0%) identified as gay, 33 (11.0%) as bisexual, and 21 (7.0%) as other sexual identities. The majority of participants were cisgender (n = 288, 96.0%), and 12 (4.0%) were gender diverse (e.g., transgender, gender fluid). Mean psychological distress score was 4.0 (SD = 3.2) and mean internalized homonegativity score was 6.9 (SD = 5.8).

Figure 1 shows mean frequency of use of each drug across each of the five study visits. Minor changes over time were observed with regards to frequency of drug use over the study period. Increased frequencies of use were observed for cannabis (visit 1 mean = 2.88, visit 5 mean = 3.24), inhalants (visit 1 mean = 1.75, visit 5 mean = 1.85), cocaine (visit 1 mean = 0.82, visit 5 mean = 1.15), and medications to improve sexual function (visit 1 mean = 1.15, visit 5 mean = 1.50). Meanwhile decreases were observed for prescription stimulants (visit 1 mean = 1.30, visit 5 mean = 1.05), and hallucinogens (visit 1 mean = 1.12, visit 5 mean = 0.89).

Table 2 depicts past three-month use of drugs as a percent of total sample at each survey. At baseline, the most

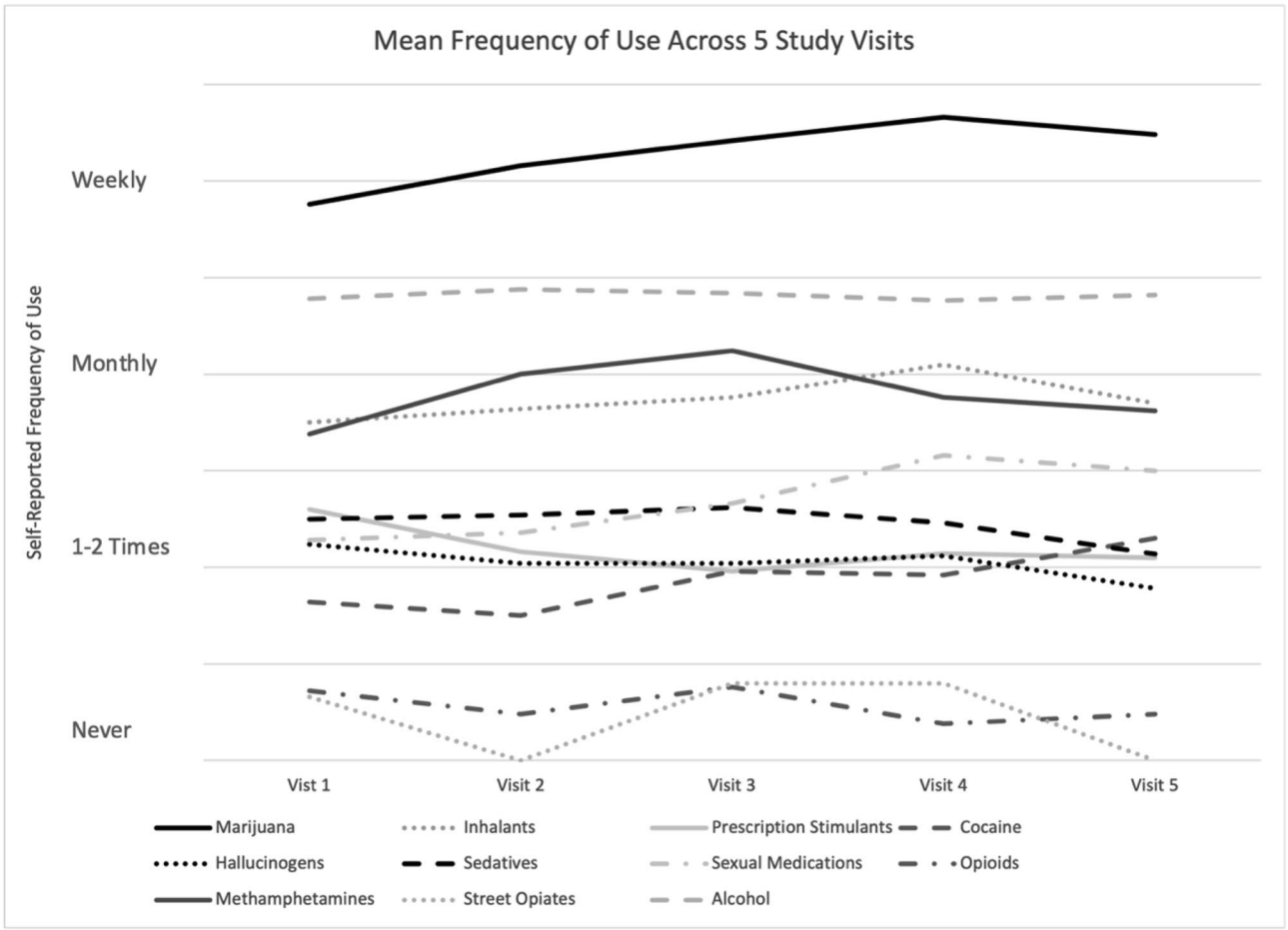

Fig. 1 Mean frequency of use among participants at each survey

Table 2 Past three-month drug use (any amount) among participants at each study visit

	Survey 1 (N = 300)		Survey 2 (N = 300)		Survey 3 (N = 290)		Survey 4 (N = 287)		Survey 5 (N = 291)	
	n	%	n	%	n	%	n	%	n	%
Cannabis	152	50.7	168	56.0	156	53.8	157	54.7	166	57.0
Inhalants	83	27.7	93	31.0	90	31.0	95	33.1	93	32.0
Hallucinogens	44	14.7	44	14.7	42	14.5	43	15.0	42	14.4
Prescription Stimulants	38	12.7	35	11.7	28	9.7	31	10.8	32	11.0
Cocaine	31	10.3	31	10.3	40	13.8	38	13.2	49	16.8
Sedatives	27	9.0	26	8.7	24	8.3	26	9.1	18	6.2
Opioids and Street Opioids	6	2.0	3	1.0	7	2.4	4	1.4	4	1.4
Sexual Function Medication	24	8.0	23	7.7	22	7.6	24	8.4	25	8.6
Methamphetamines	15	5.0	15	5.0	13	4.5	11	3.8	11	3.8
None	121	40.3	108	36.0	108	37.2	105	36.6	98	33.7

Note: May total more than 100% as categories are not mutually exclusive, except for those reporting no substance use

common drug used was cannabis (n = 152, 50.7%), followed by inhalants (n = 83, 27.7%), hallucinogens (n = 44, 14.7%), prescription stimulants (n = 38, 12.7%), cocaine (n = 31, 10.3%), sedatives (n = 27, 9.0%), medications to improve sexual function (n = 24, 8.0%), methamphetamines (n = 15, 5.0%), and opioids and street opioids (n = 6, 2.0%). No use of drugs in the past three months was reported by 121 (40.3%) participants. The commonality of drug among the sample remained the same in survey two. Cocaine use among the sample increased in each of the remaining surveys to make it more common than prescription stimulants while the use of other drugs remained relatively stable.

Table 3 Baseline correlation coefficients between psychological distress and internalized homonegativity with various drugs

	Cannabis	Inhalants	Hallucinogens	Prescription Stimulants	Cocaine
Psychological Distress	0.06	0.16	-0.13	0.08	0.04
Internalized Homonegativity	-0.15*	-0.11	-0.04	0.11	-0.11
	Sedatives	**Opioids and Street Opioids**	**Sexual Function Medication**	**Methamphetamines**	
Psychological Distress	0.21	0.17	0.16	0.41*	
Internalized Homonegativity	0.11	0.06	0.21	0.17	

*p < 0.05

Table 4 Mixed effects longitudinal models examining association of psychological distress with various drugs. Each substance represents an individual model

	Cannabis	Inhalants	Hallucinogens	Prescription Stimulants	Cocaine
	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)
Psychological Distress	0.05** (0.01, 0.08)	0.04* (0.01, 0.08)	-0.007 (-0.04, 0.02)	0.03 (-0.01, 0.07)	-0.01 (-0.04, 0.02)
	Sedatives	**Opioids and Street Opioids**	**Sexual Function Medication**	**Methamphetamines**	
	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	
Psychological Distress	0.06* (0.007, 0.11)	0.05* (0.01, 0.08)	-0.006 (-0.06, 0.05)	0.12** (0.04, 0.20)	

Note. Each substance represents an individual model; model also adjusted for age, gender identity, race/ethnicity, sexual orientation, survey number

*p < 0.05; **p < 0.01; ***p < 0.001. CI = confidence interval

Table 5 Mixed effects longitudinal models examining association of psychological distress with various drugs, adjusting for internalized homonegativity.

	Cannabis	Inhalants	Hallucinogens	Prescription Stimulants	Cocaine
	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)
Psychological Distress	0.05*** (0.02, 0.08)	0.04* (0.01, 0.08)	-0.005 (-0.04, 0.03)	0.03 (-0.02, 0.07)	-0.01 (-0.05, 0.02)
Internalized Homonegativity	-0.03** (-0.06, -0.01)	-0.005 (-0.03, 0.02)	-0.002 (-0.02, 0.02)	0.02 (-0.003, 0.05)	-0.008 (-0.03, 0.01)
	Sedatives	**Opioids and Street Opioids**	**Sexual Function Medication**	**Methamphetamines**	
	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	
Psychological Distress	0.04 (-0.01, 0.10)	0.04* (0.004, 0.08)	-0.01 (-0.07, 0.04)	0.13** (0.04, 0.22)	
Internalized Homonegativity	0.02 (-0.02, 0.06)	0.004 (-0.02, 0.03)	0.04* (0.005, 0.08)	-0.01 (0.08, 0.05)	

Note. Each substance represents an individual model; model also adjusted for age, gender identity, race/ethnicity, sexual orientation, survey number

*p < 0.05; **p < 0.01; ***p < 0.001; CI = confidence interval

Table 4 presents the first group of models using mixed effects longitudinal regression to examine the association between psychological distress and drug use. When participant psychological distress was higher than average, they also reported higher than average frequency of use of: cannabis (β = 0.05; 95% CI: 0.01, 0.08), inhalants (β = 0.04; 95% CI: 0.01, 0.08), sedatives (β = 0.06; 95% CI: 0.007, 0.11), methamphetamines (β = 0.12; 95% CI: 0.04, 0.20), and street opioids or opioids (β = 0.05; 95% CI: 0.01, 0.08). No significant associations were observed between psychological distress and frequency of use of hallucinogens, prescription stimulants, cocaine, opioids, nor medications to promote sexual function.

Next, Table 5 presents the same models adjusted for internalized homonegativity given the previous aforementioned link with psychological distress. Here, we observe, again, that when an individual has more psychological distress than average during one timepoint, adjusting for internalized homonegativity, they also had higher than usual frequency of use of: cannabis (β = 0.05; 95% CI: 0.02, 0.08), inhalants (β = 0.04; 95% CI: 0.01, 0.08), methamphetamines (β = 0.13; 95% CI: 0.04, 0.22), and street opioids or opioids

(β = 0.04; 95% CI: 0.004, 0.08). Compared to the models unadjusted for internalized homonegativity, the association between psychological distress and use of sedatives was no longer significant. As with the first model, no significant association was observed with regards to any other drugs.

Discussion

In a longitudinal cohort of Black and/or Hispanic/Latino SGD individuals, we investigated associations of psychological distress and internalized homonegativity with drug use across five time points over the span of two years. Our results indicated that within persons, greater than average levels of psychological distress were associated with more frequent use of cannabis, inhalants, methamphetamines, and opioids. Further, these associations held even after adjusting for the direct, within-person association of internalized homonegativity (and other sociodemographic covariates) with drug use frequency. These findings provide evidence of the co-morbid, within-person link between mental health and drug use and their covariance over time among non-Hispanic Black and Hispanic/Latino SGD individuals.

By contrasting lifetime drug use at baseline with drug use frequency across five surveys, we demonstrated differences in the most common drugs ever used versus drugs most frequently used over time. For example, at baseline, prevalence of lifetime cannabis use was greater than any other drug, and across surveys, cannabis was used more frequently, on average, than any other drug. These results align with other studies among Black and Hispanic/Latino SGD individuals (Petrilli et al., in press), highlighting cannabis as the most commonly used drug (excluding alcohol, not measured in the current study; Kipke et al., 2020; Schuler et al., 2020). Although sample-level, mean drug use frequency was generally stable through the duration of the study, drugs with higher prevalence of lifetime use were not always the most frequently used during the study. For example, although methamphetamines were one of the least commonly used drugs (< 10% of the sample), frequency of methamphetamine use was only outranked by cannabis. Similarly, 16% of the sample reported lifetime misuse of medications to promote sexual function, yet, on average, this was the fourth most frequently used drug over the course of the study, outranked by only cannabis, inhalants, and methamphetamines. Together, these results may be explained by potentially different types of use in this sample. First, drugs like cannabis and inhalants demonstrate both high lifetime prevalence and greater average frequency of use over time. That is, many men use these drugs and, on average, use them relatively more frequently. Additionally, methamphetamine use and use of medications to promote sexual function may be concentrated to a smaller number of men who use very often. These differences in prevalence and frequency patterns could be due in part to the many different contexts and motivations for drug use among Black and/or Hispanic/Latino sexual diverse individuals (Feinstein et al., 2016; Harawa et al., 2008).

Although sample level patterns in drug use demonstrated stability in average drug use frequency over time, our results indicated intraindividual differences in drug use as a function of psychological distress. Compared to themselves, when participants experienced above average psychological distress, their drug use frequency was also higher for cannabis, inhalants, sedatives, and methamphetamines. This association demonstrates the co-morbid link between psychological distress and drug use with variability over time. Past studies provide evidence of disparities in drug use disorders (e.g., cannabis use disorder; Rodriguez-Seijas et al., 2019), drug use prevalence (Schuler et al., 2020), and mental health disorders (Burns et al., 2015; Platt & Scheitle, 2018) when comparing Black and Hispanic/Latino sexual diverse individuals to same-race heterosexual peers or White sexual diverse individuals. However, few studies have considered psychological distress and drug use in the same models, rather as independent outcomes (see Earnshaw et al., 2020 for an exception). By taking a within-person approach, we compare individuals to themselves across time rather than contrast between groups and provide evidence that intraindividual change in psychological distress explains at least some variance in drug use among Black and/or Hispanic/Latino SGD individuals. This highlights the importance of considering individual differences in health and comorbidities over time, rather than conclusions at the group level alone.

The primary theorized explanation for elevated drug use and mental health challenges among sexual diverse individuals suggests that experiences of minority stress—unique and chronic prejudicial attitudes and action against sexual minorities—increase psychological distress and erode health (Brooks, 1981; Meyer, 2003). This study provides results that show the link between overlapping health outcomes and their covariance over time. Thus, pointing to a need to understand and target drug use together with mental health. Indeed, results provide evidence that the internalizing pathway from internalized homonegativity to drug use demonstrated in other studies (Newcomb & Mustanski, 2011; Puckett et al., 2017; Weber, 2008), may be weaker and less consistent than the direct pathway from psychological distress (operationalized here as a summary score representing indicators of anxious and depressive symptoms) to drug use frequency. One explanation for this association is the self-medication hypothesis which theorizes that some drug

use may be a direct response to or means of coping with distress (Khantzian, 1997).

Although we hypothesized that internalized homonegativity would be associated with drug use frequency based on prior research (Puckett et al., 2017; Weber, 2008), we found limited evidence for this association when including both psychological distress and internalized homonegativity in the same models. In our results, within persons, higher than average internalized homonegativity was associated with less frequent use of cannabis and more frequent use of medications to enhance sexual functions. Past research has more consistently demonstrated the association of internalized homonegativity and mental health outcomes (DiGuiseppi et al., 2022; Newcomb & Mustanski, 2010; Walch et al., 2016) compared to weaker results regarding internalized homonegativity and drug use (Newcomb & Mustanski et al., 2011). It is possible that the mechanistic mediators underlying pathways from internalizing homonegativity to mental health and drug use are different and require additional analyses to uncover mechanisms. It may also be possible that the pathway from internalized homonegativity is indirect and mediated, even partially, by psychological distress as demonstrated by Earnshaw et al. (2020) and Moody et al. (2018).

Limitations & future directions

Despite the strengths elucidated by way of this study, there are noteworthy limitations. The current study relied on a non-probability sample which limits generalizability to Black and/or Hispanic/Latino sexual diverse individuals in the United States more broadly. Despite limitations with generalizability, the current sample is one of only a handful of longitudinal cohorts of Black and/or Hispanic/Latino sexual diverse individuals and includes participants from more than 40 states, one territory (Puerto Rico), and Washington, DC. In addition, this sample is diverse in terms of race/ethnicity, sexual orientation, and with regard to patterns of drug use. Additionally, participants selected for longitudinal follow-up were chosen based on their drug use profiles – of the nearly 650 participants who provided permission for recontact, we prioritized following participants with drug use histories.

Prevalence rates of some drugs were very low (e.g., street opioids and opioids: n = 6, 2.0%) which limits variance in drug use frequency to a small number of participants. We disaggregated drug types in effort to increase specificity in associations between psychological distress and drug use in contrast to approaches where many drugs are combined into an aggregated category to increase power and decrease specificity. In addition, although alcohol is frequently the most commonly used substance among sexual diverse individuals, inconsistencies in recall time scale for alcohol and other drugs in this study prevented us from including alcohol in the current analyses. Future research is needed to examine comorbidity with psychological distress and drinking among Black and/or Hispanic/Latino sexual diverse individuals and whether this association is different from other drugs.

Although results of this study demonstrate a co-morbid association between psychological distress and some drug use, we are unable to make conclusions regarding causal pathways in the current analysis. Results should be interpreted as correlational associations within persons, demonstrating covariance in psychological distress and drug use frequency over time, but no conclusion regarding temporality and causal order from psychological distress to drug use. Future research could further unpack this association by examining lagged effects of psychological distress on drug use or the association of psychological distress with trajectories of drug use over time. In addition, context and motivation drug use may be important additional factors for unpacking comorbidity of psychological distress and drug use in future studies of Black and/or Hispanic/Latino sexual diverse individuals. This could help explain why some, but not all drug use, was associated with individual variation in psychological distress. Further, how specific drugs and classes of drugs are used in relation to mental health is an important next step for researchers to consider in their attempts to better link use of specific drugs to co-occurring mental health problems and internalized homonegativity. Additionally, better understanding the role of substance use during sexual intercourse (e.g., chemsex), and its impact on mental health, might aid researchers in better explaining findings such as those presented in this study. Future research should continue to consider the patterns, types of drugs used, and other components of chemsex in relation to co-occurring mental health concerns. Last, our findings have implications for interventions – given the close link between psychological distress and drug use, interventions should include components that target and potentially treat mental health disordered and psychological stress.

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Data Availability Data is available upon request.

Code Availability Data is available upon request.

Conflicts of interest/Competing interests The authors have no conflicts to declare.

Ethics approval and consent to participate The research presented uses research on human subjects; IRB approval was obtained from the University of Connecticut (IRB protocol #L19-030). The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Consent to participate Participants provided electronic consent to participate.

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