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The moderating role of resilience resources in the association between crime exposure and substance use among young sexual minority men

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Abstract

Objectives: Substance use is prevalent among young sexual minority men and crime exposure is linked with adverse health behaviors. Guided by the protective model of resilience, we examined the impact of being a crime victim and resilience resources on substance use behaviors, and whether resilience moderated associations between crime exposure and substance use behaviors.

Methods: A cross-sectional sample of young sexual minority men (n=720) ages 15 to 24 participated in a one-time survey conducted in seven cities across the United States. Participants' mean age was 21.2 years; 50% self-identified as Black, and 66% self-identified as gay. Participants self-reported on sociodemographic factors, crime exposure, resilience resources, and substance use behaviors. We fit generalized estimating models to examine associations between crime exposure, resilience resources, and the interaction between crime exposure and resilience resources on substance use behaviors.

Results: Overall, 31% reported heavy alcohol use, 54% monthly marijuana use, 14% drug use, and 26% reported being a victim of a crime. Crime exposure was associated with an increased odds of alcohol (AOR=1.45, 95%CI: 1.02, 2.14), marijuana (AOR=1.41, 95%CI: 1.07, 2.04), and drug use (AOR=1.94, 95%CI: 1.14, 2.98). Resilience resources were associated with a reduced odds of alcohol use (AOR=0.66, 95%CI: 0.47, 0.93), marijuana use (AOR=0.82, 95%CI: 0.60, 0.98), and drug use (AOR=0.85, 95%CI: 0.54, 0.96). There was a significant interaction such that resilience resources reduced associations between crime exposure and alcohol and drug use.

Conclusions: Findings support the protective effects of resilience resources for young sexual minority men. Results highlight the importance of ensuring the availability of community resources to meet the needs of sexual minority youth.

Keywords

Substance use; sexual minority men; youth; crime exposure; resilience resources

Young sexual minority men are more likely to engage in alcohol misuse, marijuana use, and other drug use than their heterosexual peers (Caputi, Smith, Strathdee, & Ayers, 2018; Corliss et al., 2010; Marshal, Friedman, Stall, & Thompson, 2009; Newcomb, Heinz, & Mustanski, 2012). One meta-analysis found that sexual minority youth are nearly twice as likely to engage in substance use compared to heterosexual youth (Marshal et al., 2008). Alcohol, marijuana, and other drug use among young sexual minority men has been associated with adverse risk behaviors and health outcomes, including condomless sex (Bruce, Kahana, Harper, & Fernandez, 2013; Gamarel et al., 2016), sexually transmitted infections (Gamarel et al., 2017), mental health problems (Halkitis et al., 2013), and criminal justice involvement (Gamarel et al., 2016). Given the documented sexual orientation disparities in substance use, a growing body of research has examined factors that may contribute to substance behaviors among young sexual minority men, including exposure to crime (Newcomb et al., 2012; Thiede, Valleroy, MacKellar, & Celentano, 2003).

Exposure to crime, specifically being a victim of a crime, is widely recognized as a significant public health concern (Rutherford, Zwi, Grove, & Butchart, 2007; The United States Department of Justice, 2012). Youth experience higher rates of exposure to crime than adults (Finkelhor, 2008; Hashima & Finkelhor, 1999). Exposure to crime has been associated with adverse physical and mental health outcomes in youth (Gilbert et al., 2009; Hurt, Malmud, Brodsky, & Giannetta, 2001; Widom, 1998), including long-term effects in adulthood (Fergusson, Boden, & Horwood, 2008; Fergusson & Horwood, 1998). Evidence suggests that young sexual minority males, racial/ethnic minorities, and urban residents are also more likely to be victims than their peers, including hate crimes (Buka, Stichick, Birdthistle, & Earls, 2001; Knight & Wilson, 2016; Peterson & P Anfil, 2014; Woods, 2017). Hate crimes range from trespassing and harassment to destruction of property and acts of violence (Green, McFalls, & Smith, 2001). Sexual minorities are a frequent target of hate crimes (Herek, 2009; Potok, 2010), which can result in substance use (Duncan & Hatzenbuehler, 2014; Duncan et al., 2014) and further exposure to violence or abuse, including homelessness and family rejection. As result of these experiences, they may become at risk for committing a range of crimes themselves from petty theft to violence in order to survive (Woods, 2017).

The effect of exposure to crime (i.e., being a victim of a crime) is often identified as significant risk factor for substance use for youth (Kilpatrick et al., 2000; Zinzow et al., 2009). Some research shows that exposure to crime is not randomly distributed but tends to cumulate for certain individuals in particular environments (Tseloni & Pease, 2003). Neighborhood and community contexts appear to contribute to substance use. That is, sexual minority men (Buttram & Kurtz, 2013) and sexual minority youth (Duncan, Hatzenbuehler, &

Johnson, 2014) who live in neighborhoods with high rates of crime and those who are living in poverty are more likely to engage in substance use. However, to our knowledge, limited research has sought to identify factors that may moderate the association between exposure to crime and substance use among young sexual minority men.

In order to understand how to intervene on substance use disparities among sexual minority youth, calls have been made to identify resilience processes that can offset the deleterious effects of crime exposure and other forms victimization (e.g., bullying, verbal and physical harassment) and promote health-enhancing behaviors (Herrick, Stall, Goldhammer, Egan, & Mayer, 2014; Mustanski, Newcomb, & Garofalo, 2011; Wexler, DiFluvio, & Burke, 2009). Resilience has been defined as “the process of overcoming the negative effects of risk exposure, coping successfully with traumatic experiences and avoiding the negative trajectories associated with risk” (Fergus & Zimmerman, 2005, p. 399). Resilience is often conceptualized as a personality trait (e.g., post-traumatic growth, optimism) or a coping style (e.g., approach-orientated or active coping), including within sexual minority communities (Lyons, 2015). These definitions of resilience have the tendency to inappropriately place the responsibility on survivors of violence to “bounce back” or “overcome” adversity without acknowledging the importance of an individual’s social contexts (Lepore & Revenson, 2006). On the contrary, the protective model of resilience posits that external resources may moderate or reduce the negative effects of adversity for youth (Fergus & Zimmerman, 2005). Within the protective model of resilience, resilience resources (e.g., access to community organizations) are defined as mitigating or buffering factors that are external to the individual and have the potential to help youth overcome adversity (Fergus & Zimmerman, 2005).

External resilience resources, such as family acceptance, have been associated with reduced odds of depressive symptoms, suicidal ideation, and non-suicidal self-injury among sexual minority youth (Reisner, Biello, Perry, Gamarel, & Mimiaga, 2014; Ryan, Russell, Huebner, Diaz, & Sanchez, 2010). Similarly, supportive school environments (e.g., Gay Straight Alliances) and social media campaigns (e.g., It Gets Better) have been associated with better mental health and a reduced odds of substance use behaviors among sexual minority youth (Heck, Flentje, & Cochran, 2011; Lyons, 2015). Connection to community and social resources have been shown to offset the negative effects of stigma on stress among sexual minority adults (McConnell, Janulis, Phillips, Truong, & Birkett, 2018). Thus, identifying modifiable resilience resources (e.g., having one’s resource needs met, community support) may help reduce negative outcomes such as engaging in substance use behaviors even when youth are exposed to crime (Berkman & Kawachi, 2000; Eisman, Stoddard, Heinze, Caldwell, & Zimmerman, 2015; Singh, 2017). In accordance with the protective model of resilience (Fergus & Zimmerman, 2005), which has been expanded to sexual minority populations (McConnell et al., 2018; Singh, 2017), it is plausible that even in the context of exposure to crime, resilience resources such as having one’s community resources needs met, engaging in Lesbian, Gay, Bisexual, and Transgender (LGBT)-welcoming activities, and satisfaction with community support may reduce the negative effects of crime exposure on substance use behaviors for young sexual minority men.

The Current Study

The goal of the current cross-sectional study was to examine whether crime exposure and resilience resources were independently associated with engaging in heavy episodic alcohol use, marijuana use, and recreational drug use among young sexual minority men. We additionally explored associations between exposure to crime, resilience resources, and each of these substance use outcomes. We hypothesized that crime exposure would increase the odds of substance use behaviors, and that resilience resources would be associated with a reduced odds of substance use behaviors. We were then particularly interested in which, if any, form of resilience resources offset associations between crime exposure and substance use behaviors.

Methods

Study data came from a multi-site study on structural changes and exposure to HIV risk among at-risk urban youth. The details of the study has been described elsewhere (Miller et al., 2017; Miller et al., 2016). Participants were recruited from multiple community sites in seven urban cities in the United States between August 2012 and December 2013. This study used venue-based sampling recruitment strategies (Chutuaape et al., 2009) such that youth were approached at places where they congregate (e.g., clubs, parks, and social service organizations). If youth were interested in participating, study staff consented them to be screened for the study. Those who screened eligible, were consented for the study and completed a confidential audio computer assisted interview (ACASI). All local sites received a waiver of parental consent. Participants were provided with incentives in the form of gift cards or cash ranging in value from \$20-50, depending upon what the local site requested and their IRB approved.

Participants ($N = 720$) for the current study are from seven cities (Los Angeles [$n=107$, 14.9%], Washington, DC [$n=99$, 13.8%], Philadelphia [$n=98$, 13.6%], Detroit [$n=97$, 13.5%], Baltimore [$n=100$, 13.9%], Boston [$n=98$, 13.6%], and Denver [$n=121$, 16.8%]). The analytic sample was confined to youth who self-reported a male sex assigned at birth and male gender identity. Given the small number of individuals who self-reported an HIV-positive serostatus ($n = 43$), self-identified as a transgender woman ($n = 33$) or transgender man ($n=14$), we restricted our analysis to HIV-negative cisgender men.

Measures

Sociodemographic Characteristics.—Youth reported their age in years. We then categorized age into developmental groups (1=15-17 middle adolescence; 2=18-20 late adolescence, 0=21-24 early adulthood) (Williams, Thomson, Seto, & et al., 2012). Given the small number of participants who identified as Native American or Alaskan Native ($n = 7$) and other ($n = 14$), we created a four-category race/ethnicity variable (1=non-Hispanic Black, 2=Latinx/Hispanic, 3=non-Hispanic White, 4=non-Hispanic Other). Participants reported their sexual orientation identity with response options: 1) Straight/Heterosexual, 2) Gay/Lesbian, 3) Bisexual, 4) Rather not answer, and 5) Not sure or undecided. None of the participants refused to answer the sexual identity variable or identified as Straight/Heterosexual. We created a three-category variable (0=Gay, 1=Bisexual, 2=Unsure/

Questioning). Participants reported if they had ever been homeless (1=yes, 0=no). Homelessness was defined as having to stay one night or more in a place that was not their home because they could not stay in their home or did not have a home, including having to stay in temporary housing, a shelter or car. Participants also reported their highest level of educational attainment (1=Less than high school graduate; 2=High school graduate or GED; 3=Some college or post-secondary education; 4=College graduate or greater).

Crime Exposure.—Crime exposure was assessed with a single item that has been used in prior studies with adolescents and young adults (Boyer et al., 2017), which asked participants whether they had been a victim of a crime in the past year (1=yes, 0=no).

Resilience Resources.—Participants completed three indicators of resilience resources, which have been used in prior studies (Miller et al, 2016). First, participants were asked the extent to which they agreed or disagreed with the following statement: “I feel that my needs are met by the resources available in my community,” with responses ranging from 1=Strong Agree to 5=Strongly Disagree, which was reverse coded such that higher scores indicated that their needs were met. Second, accessing LGBT-welcoming resources was assessed with a single item adapted from a prior scale (Schriner & Fawcett, 1988), which asked participants whether they had participated in activities or events that were welcoming to gay, lesbian, bisexual, and transgender youth in the past year (1=yes, 0=no). Third, perceived satisfaction with community support was assessed by participants completing four items (Schriner & Fawcett, 1988) that measured how satisfied they were with the support that they received within their community (example items: “How satisfied are you that people in your community are looking for new ways to support youth like you?”; “How satisfied are you with the opportunities to interact with people of all ages in your community?”). Participants responded to the items on a 4-point Likert-type scale which ranged from 0=very unsatisfied to 4=very satisfied. A mean score was created such that higher scores indicated greater satisfaction with community support. The scale demonstrated adequate psychometric properties in this sample ($\alpha = 0.78$).

Substance Use Outcomes.—Participants reported on three substance use behaviors in the past 3 months from the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST), which has been used in studies of YLWH (Gamarel et al, 2016; Gamarel et al, 2017). First, participants answered the question: “How often did you have 5 or more drinks of alcohol in one day (including the evening) in the past 3 months?” Responses were: “Never” (0), “Less than monthly” (1), “Monthly” (2), “Weekly” (2), “Daily or almost daily” (3). Heavy episodic alcohol use was coded as: “1” any reported occurrence of 5 or more drinks versus “0” never drank 5 or more drinks on a single occasion in the past 3 months. Second, participants answered the question: “How often did you smoke marijuana in the past 3 months?” Responses were: “0 times” (0), “Once a month or less” (1), “More than once a month, but less than once a week” (2), “One or more times a week, but not every day” (3), “Every day” (4). We created a dichotomous variable where “1” indicated at least monthly marijuana use versus “0” no marijuana use in the past 3 months. Finally, participants were asked about their use of other drugs. Participants were asked to answer the question: “What drugs other than marijuana have you used?” Responses included: “Crack Cocaine” “Other

forms of Cocaine” “Heroin with a needle” “Heroin without a needle” “Other Narcotics (Vicodin, Oxycontin, Percocet, Dilaudid, Darvon, Demerol, morphine, codeine)” “Crystal Methamphetamine” “Other Amphetamines” “Ecstasy” “Other club drugs” “LDS” “Barbiturates” “Inhalants”. We created a dichotomous variable for drug use such that any reported use of drugs in the past 3 months was coded as “1” versus no drug use, which was coded as “0”.

HIV Sexual Risk.—Given the documented associations between crime exposure, substance, and HIV risk Rhodes (Rhodes, 2002; Rhodes & Simic, 2005), we created an index of HIV sexual risk behavior based on responses to five questions: (1) ever had sex with someone who injects drugs; (2) ever exchanged sex for drugs or money; (3) ever had sex with someone who you suspected of having HIV; (4) ever had sex with someone who you knew had HIV, or who you now know has HIV; and (5) ever had a sexually transmitted infection. Consistent with prior studies (Miller et al., 2018), this variable could range from 0 to 5, with 0 indicating no lifetime risk and 5 indicating high HIV risk.

Statistical Analyses

For these analyses, there were no missing data or incomplete responses. Descriptive statistics were calculated for all variables included in the analyses, including the distribution of scales, with appropriate tests for normality (e.g., Shapiro-Wilk test). Due to the nested nature of these data, we fit a series of generalized estimating equation (GEE) models with a binary outcome distribution specification to examine the associations between crime exposure victimization, resilience resources, and each of the substance use behaviors. GEE models were chosen because they treat dependency between participants within study site as a nuisance parameter and provide more appropriate estimates by statistically adjusting for this dependency within study site (Burton, Gurrin, & Sly, 1998). We assessed collinearity of variables using variance inflation factors (VIFs) with a cutoff of 4.0 (Pan & Jackson, 2008). For all GEE models, we used an exchangeable correlation structure. The first set of GEE models using a binary outcome distribution estimation assessed bivariate associations between sociodemographics, crime exposure victimization, resilience resources, and each of the substance use behaviors. We then fit three separate multivariable GEE models using a binary outcome distribution estimation to assess whether crime exposure and resilience resources were independently associated with each of the substance use behaviors, over and above sociodemographic factors. The covariates included in the multivariable GEE models were selected a priori and included factors previously shown to be associated with substance as described above. All potential confounders were included in the final models. Finally, we fit three additional multivariable GEE models to examine the extent to which each of three indicators of resilience resources moderated the associations between crime exposure and each of the three substance use outcomes. Each model statistically adjusted for the multiplicative effects of crime exposure with the other two resilience variables in order to produce the strongest test of which interaction(s) remain statistically significant in moderating the associations between crime exposure and each substance use outcomes. All analyses were conducted with SPSS version 25. We also fit all multivariable GEE models with only youth who self-identified as gay or bisexual and the results were similar.

Results

Descriptive characteristics of the sample and bivariate GEE models examining whether crime exposure and resilience resources were differently associated with each of the substance use behaviors are presented in Table 1. Participants ranged in age from 15 to 24 years old ($M = 21.16$, $SD = 2.10$). The vast majority of the sample identified as persons of color (i.e., 50% non-Hispanic Black/African American, 5% Hispanic Black/African American, 14% non-Hispanic Other, 16% Hispanic Other, and 10% Hispanic White). Over one-third (35.1%, $n=253$) of participants reported being homeless at some point in their lifetime and the majority (66.4%, $n=478$) of the participants self-identified as gay. In regards to educational attainment, 3.5% of the sample had completed 8th grade and were in high school, 9.6% had earned less than a high school degree, 43.3% had earned a high school or GED degree, 33.9% were in college, and 9.7% had earned a college degree or higher. Over half of the sample had a high school degree or less (54.4%). Nearly one-third (31.1%, $n=224$) reported monthly or more frequent heavy episodic drinking, over half (54.4%, $n=392$) reported using at least monthly marijuana use, and approximately 15% ($n=105$) reported non-marijuana drug use in the last 3 months. One-quarter of the sample reported that they had been a victim of a crime (26.0%, $n=187$). In regard to community-level resilience resources, the average response to having resource needs met was 2.50 ($SD = 1.23$), over three-quarters had engaged in LGBT-welcome activities in the past year (77.5%, $n=558$), and the average perceived level of support was 2.82 ($SD=0.82$).

Table 1 presents the bivariate GEE models examining whether crime exposure and resilience resources were associated with each of the substance use behaviors. Being the victim of a crime was associated with an increased odds of heavy episodic alcohol use, at least monthly marijuana use, and any drug use. Higher levels of reporting that one's resource needs were met was associated with a reduced odds of heavy episodic alcohol use, at least monthly marijuana use, and any drug use. Higher levels of perceived community support was associated with reduced odds of at least monthly marijuana use (but was not associated with alcohol use or any drug use). Accessing LGBT activities was not associated with any of the substance use behaviors.

Table 2 presents the multivariable GEE models examining whether being the victim of a crime and each indicator of resilience resources were associated with each of the substance use behaviors after statistically adjusting for all sociodemographic characteristics and HIV sexual risk. Crime exposure was associated with an increased odds of heavy episodic alcohol use ($AOR = 1.45$, 95% CI: 1.02, 2.14, $p<0.05$), at least monthly marijuana use ($AOR=1.41$, 95% CI: 1.07, 2.04, $p<0.05$), and any drug use ($AOR = 1.84$, 95% CI: 1.14, 2.98, $p<0.05$). Greater reports of having resources needs met was associated with a reduced odds of heavy episodic alcohol use ($AOR = 0.66$, 95% CI: 0.47, 0.93, $p<0.05$), at least monthly marijuana use ($AOR = 0.82$, 95% CI: 0.60, 0.98, $p<0.05$) and any drug use ($AOR = 0.54$, 95% CI: 0.54, 0.96, $p<0.05$). Greater levels of perceived community support was associated with reduced odds of heavy episodic alcohol use ($AOR = 0.28$, 95% CI: 0.03, 0.58, $p<0.05$).

The multivariable GEE models with each of the interaction terms included simultaneously in each model are presented in Table 3. Greater reports of having resource needs met

moderated the association between crime exposure and heavy episodic alcohol use (AOR = 0.54, 0.22, 0.83, $p < 0.05$) and any drug use (AOR = 0.54, 95% CI: 0.20, 0.69, $p < 0.05$). As shown in Figure 1, the interaction term indicated that the effect of crime exposure was associated with lower odds of heavy episodic alcohol use among participants who were higher in reporting their resource needs were met compared to those whose were lower in reporting their resource needs were met. The same pattern of results emerged for reporting any drug use (see Figure 2), illustrating that effects of crime exposure on drug use was substantially reduced among participants who reported higher scores on their resource needs being met compared to those who scored lower. There was no significant moderation effects for perceived community support or engaging in LGBT activities in the association between crime exposure and substance use behaviors.

Discussion

Consistent with prior research with sexual minority youth, we found high levels of heavy episodic alcohol use and marijuana use (Lian-Yu, Martins, Strain, Ramin, & Storr, 2018; Patrick & Schulenberg, 2014), as well as exposure to crime in the past year. Study findings confirmed prior studies demonstrating that crime exposure was associated with increased risk of substance use (Duncan & Hatzenbuehler, 2014; Duncan et al., 2014), whereas resilience resources were associated with reduced risk of substance use. Importantly, we found a significant intervention such that resilience resources reduced associations between crime exposure and alcohol and drug use.

Although our measure of crime exposure did not permit us to assess what specific types of crime may be associated with engaging in substance use behaviors, these findings have important implications for sexual minority youth. Specifically, sexual minority youth are more likely to experience sexual minority stress, such as sexual and physical assault, LGBT-specific bullying (Friedman et al., 2011), as well as isolation and a lack of family acceptance (Caputi, Smith, & Ayers, 2017). Therefore, it is important for future research to assess which specific forms of crime may exacerbate substance use behaviors as well as the potential role other sexual minority stressors may play in these relations.

The second aim of this study was to examine the direct effects of external resilience resources on substance use behaviors. After statistically adjusting for exposure to crime and other socio-demographic factors (i.e., race/ethnicity, sexual identity, homelessness), some of the resilience resources were associated with a reduced odds of substance use behaviors. Specifically, having one's community resource needs met was associated with a reduced odds of engaging in each of the substance use behaviors; whereas, perceived community support was only associated with a reduced odds of engaging in heavy episodic alcohol use. Notably, engaging in LGBT-welcoming activities was not associated with substance use behaviors. Although some research has found that LGBT community involvement is protective against substance use behaviors (Lelutiu-Weinberger et al., 2013), other research has found that LGBT community involvement is associated with an increased risk of engaging in substance use (Demant, Hides, White, & Kavanagh, 2018). Given our results, it is plausible that more broad community support, including having resources needs met, may be important for substance use prevention alongside LGBT-affirming spaces.

Finally, we found that resilience resources, specifically having one's resource needs met, offset or reduced the association between being a crime victim and heavy episodic alcohol use and drug use. These results are consistent with the protective model of resilience (Fergus & Zimmerman, 2005), which posits that impact of adversity, like exposure to crime, can be attenuated for youth who are high in external resources, such as community resources. Although perceptions of community support were protective for alcohol use, our findings suggest that tangible resources appear to be the most important resilience resources where victims may get support and subsequently not be as likely to engage in substance use behaviors to cope with adversity.

Limitations

Despite the notable strengths of this study, there are several important limitations. First, our study did not specify the different types of crime and youth may experience a wide range of exposure to crime (e.g., petty theft, physical or sexual assault). Additionally, our study did not assess witnessing a crime or violence, which is an important area for future research. Sexual minority youth also experience sexual minority specific forms of violence (e.g., rejection and discrimination based on their sexual orientation). Understanding how these LGBT-specific forms of violence impact substance use will be important to capture the whole picture of how experiences of crime relate to substance use behaviors among this marginalized group. Similarly, resilience resources were also assessed with binary measures and may also consist of other external resources that were not measured in our study such as family acceptance and school support. These other external resources may serve as a stronger moderator of the associations between crime exposure and substance use behaviors than the indicators included in our measure. Second, this study is based on a cross-sectional design so temporality cannot be established. For example, it is plausible that substance use may expose youth to crime. Therefore, longitudinal research is warranted to better understand the nature of these associations. Third, although participants reported high rates of substance use and crime exposure and we utilized ACASI, there is the potential that substance use data may be biased due to social desirability and recall bias. Fourth, we were unable to stratify models by racial/ethnic identity due to the small number of participants who identified as Other or White non-Hispanic; thus, future research is necessary to better understand the ways in which exposure to crime and other forms of stigma (e.g., racism) interact with resilience resources and are related to substance use behaviors among different racial/ethnic populations. Fifth, this study only included sexual minority men. Studies have illustrated that gender interacts with sexual minority status and substance use (Caputi, 2018); therefore, future research is warranted to better understand whether there are differences in substance use by gender identity. Sixth, this study did not collect detailed neighborhood data (Rhodes, 2002), which is an important area for future research. Seventh, data were collected over five years ago in urban cities where there has been increased LGBT-youth focused services; therefore, these findings may not be generalizable to sexual minority men presently or other geographic locales. Finally, our study did not assess intrapersonal resilience variables (e.g., coping styles, posttraumatic growth), which may relate to accessing resilience resources and substance use behaviors. For example, sexual minority youth who have access to community resources may engage in more active coping styles, which may reduce engagement in substance use behaviors. Future research assessing the role of

resilience in alleviating substance use disparities among sexual minority youth should make a point of assessing both external and intrapersonal resilience processes.

Conclusions

Despite these limitations, this study offers new and important insights into the impact of exposure to crime and the role of external resilience resources in offsetting the potential effects of adversity on substance use behaviors among sexual minority men. Our results illustrate that crime exposure may contribute to elevated substance use rates among sexual minority youth, which is a significant public health concern. However, our findings suggest that there may be ways to address the associations between crime exposure and substance use behaviors for sexual minority youth. Specifically, in our sample, crime exposed youth who felt that their needs were met by the community resources available to them reported less substance use compared to those who felt that their needs were not met by community resources. Future research is urgently needed to identify the different types of desired, available, and most frequently utilized community resources (e.g., mental health services, substance use programs, LGBT youth-serving organizations) to inform intervention and program planning; however, study findings suggest that external resilience resources can help reduce substance use disparities experienced by crime-exposed sexual minority youth. Specifically, policies aimed at creating and sustaining community resources (e.g., mental health, physical health, and social resources) that meet the needs of young sexual minority men, particularly in areas with high levels of substance use and crime, could help mitigate the deleterious effects of both substance use and crime on the health of these youth. Additionally, clinical interventions that help crime-exposed sexual minority youth to identify and connect with existing community resources would also likely be beneficial. Ultimately, this research suggests that future interventions and programs to alleviate disparities in substance use will need to invest in ensuring that community resources are accessible and meet the needs of sexual minority youth.

References

- Berkman L, & Kawachi I (2000). *Social Epidemiology* (Vol. Oxford): Oxford Press.
- Boyer CB, Greenberg L, Chutuape K, Walker B, Monte D, Kirk J, Ellen JM & the Adolescent Medicine Trials Network. (2017). Exchange of sex for drugs or money in adolescent and young adults: An examination of sociodemographic factors, HIV-related risk, and community context. *Journal of Community Health*, 42(1), 90–100. [PubMed: 27498094]
- Bruce D, Kahana S, Harper GW, & Fernandez MI (2013). Alcohol use predicts sexual risk behavior with HIV-negative or partners of unknown status among young HIV-positive men who have sex with men. *AIDS Care*, 25(5), 559–565. [PubMed: 22971018]
- Buka SL, Stichick TL, Birdthistle I, & Earls FJ (2001). Youth exposure to violence: prevalence, risks, and consequences. *American Journal of Orthopsychiatry*, 71(3), 298–310. [PubMed: 11495332]
- Burton P, Gurrin L, & Sly P (1998). Tutorial in biostatistics: Extending the simple linear regression model to account for correlated responses: An introduction to generalized estimating equations and multi-level mixed modeling. *Statistics in Medicine*, 17, 1261–1291. [PubMed: 9670414]
- Buttram ME, & Kurtz SP (2013). Risk and protective factors associated with gay neighborhood residence. *Am J Mens Health*, 7, 110–118. [PubMed: 22948299]
- Caputi TL (2018). Sex and orientation identity matter in the substance use behaviors of sexual minority adolescents in the United States. *Drug and Alcohol Dependence*, 187, 142–148. [PubMed: 29665492]

- Caputi TL, Smith D, & Ayers JW (2017). Suicide risk behaviors among sexual minority adolescents in the United States, 2015. *Jama*, 318(23), 2349–2351. [PubMed: 29260214]
- Caputi TL, Smith LR, Strathdee SA, & Ayers JW (2018). Substance Use Among Lesbian, Gay, Bisexual, and Questioning Adolescents in the United States, 2015. *American Journal of Public Health*, 108(8), 1031–1034. [PubMed: 29995487]
- Chutuaape K, Ziff M, Auerswald C, Castillo M, McFadden A, Ellen J, & Interventions, f. t. A. M. T. N. f. H. A. (2009). Examining differences in types and location of recruitment venues for young males and females from urban neighborhoods” Findings from a multi-side HIV prevention study. *Journal of Urban Health*, 86(1), 31–42. [PubMed: 18972210]
- Corliss HL, Rosario M, Wypij D, Wylie SA, Frazier AL, & Austin SB (2010). Sexual orientation and drug use in a longitudinal cohort study of U.S. adolescents. *Addictive Behaviors*, 35, 517–521. [PubMed: 20061091]
- Demant D, Hides L, White KM, & Kavanagh DJ (2018). Effects of participation in and connectedness to the LGBT community on substance use involvement of sexual minority young people. *Addictive Behaviors*.
- Duncan DT, & Hatzenbuehler ML (2014). Lesbian, gay, bisexual, and transgender hate crimes and suicidality among a population-based sample of sexual-minority adolescents in Boston. *American Journal of Public Health*, 104(2), 272–278. [PubMed: 24328619]
- Duncan DT, Hatzenbuehler ML, & Johnson RM (2014). Neighborhood-level hate crimes and current illicit drug use among sexual minority youth. *Drug and Alcohol Dependence*, 135(1), 65–70. [PubMed: 24326203]
- Eisman AB, Stoddard S, Heinze J, Caldwell CH, & Zimmerman MA (2015). Depressive symptoms, social support and violence exposure among urban youth: A longitudinal study of resilience. *Dev Psychol*, 51(9), 1307–1316. [PubMed: 26147772]
- Fergus S, & Zimmerman M (2005). Adolescent resilience: a framework for understanding healthy development in the face of risk. *Ann Rev Public Health*, 26, 399–419. [PubMed: 15760295]
- Fergusson DM, Boden JM, & Horwood LJ (2008). Exposure to childhood sexual and physical abuse and adjustment in early adulthood. *Child Abuse Negl*, 32(6), 607–619. [PubMed: 18565580]
- Fergusson DM, & Horwood LJ (1998). Exposure to interparental violence in childhood and psychosocial adjustment in young adulthood. *Child Abuse Negl*, 22(5), 339–357. [PubMed: 9631247]
- Finkelhor D (2008). *Childhood Victimization: Violence, Crime, and Abuse in the Lives of Young People*. New York, NY: Oxford University Press.
- Finkelhor D, Turner H, Ormrod R, & Hamby SL (2009). Violence, abuse, and crime exposure in a national sample of children and youth. *Pediatrics*, 124(5), 1411. [PubMed: 19805459]
- Finkelhor D, Turner HA, Shattuck A, & et al. (2015). Prevalence of child exposure to violence, crime, and abuse: Results from the National Survey of Children’s Exposure to Violence. *JAMA Pediatrics*, 169(8), 746–754. [PubMed: 26121291]
- Friedman MS, Marshal MP, Guadamuz TE, Wei C, Wong CF, Saewyc E, & Stall R (2011). A meta-analysis of disparities in childhood sexual abuse, parental physical abuse, and peer victimization among sexual minority and sexual nonminority individuals. *American Journal of Public Health*, 101(8), 1481–1494. [PubMed: 21680921]
- Gamarel KE, Brown L, Kahler CW, Fernandez MI, Bruce D, Nichols S, & Intervention, T. A. M. T. N. f. H. A. (2016). Prevalence and correlates of substance use among youth living with HIV in clinical settings. *Drug and Alcohol Dependence*, 169, 11–18. [PubMed: 27750182]
- Gamarel KE, Nichols S, Kahler CW, Westfall AO, Lally MA, Wilson CM, & the Adolescent Medicine Trials Network for HIV/AIDS Interventions. (2017). A cross-sectional study examining associations between substance use frequency, problematic use, and STIs among youth living with HIV. *Sexually Transmitted Infections*.
- Gilbert R, Widom CS, Browne K, Fergusson D, Webb E, & Janson S (2009). Burden and consequences of child maltreatment in high-income countries. *Lancet*, 373(9657), 68–81. [PubMed: 19056114]
- Green DP, McFalls LH, & Smith JK (2001). Hate crime: An emergent research agenda. *Annual review of sociology*, 27(1), 479–504.

- Halkitis PN, Moeller RW, Siconolfi DE, Storholm ED, Solomon TD, & Bub KL (2013). Measurement model exploring a syndemic in emerging adult gay and bisexual men. *AIDS and Behavior*, 17(2), 662–673. [PubMed: 22843250]
- Hashima P, & Finkelhor D (1999). Violent victimization of youth versus adults in the National Crime Victimization Survey. *J Interpers Violence*, 14(8), 799–820.
- Heck NC, Flentje A, & Cochran BN (2011). Offsetting risks: High school gay-straight alliances and lesbian, gay, bisexual, and transgender (LGBT) youth. *School Psychol Quart*, 26(2), 161–174.
- Herek GM (2009). Hate crimes and stigma-related experiences among sexual minority adults in the United States: Prevalence estimates from a national probability sample. *Journal of interpersonal violence*, 24(1), 54–74. [PubMed: 18391058]
- Herrick AL, Stall R, Goldhammer H, Egan JE, & Mayer KH (2014). Resilience as a research framework and as a cornerstone of prevention research for gay and bisexual men: Theory and evidence. *AIDS and Behavior*, 18, 1–9. [PubMed: 23321946]
- Hurt H, Malmud E, Brodsky NL, & Giannetta J (2001). Exposure to violence: psychological and academic correlates in child witnesses. *Arch Pediatr Adolesc Med*, 155(12), 1351–1356. [PubMed: 11732955]
- Kilpatrick DG, Acierno R, Saunders B, Resnick HS, Best CL, & Schnurr PP (2000). Risk factors for adolescent substance abuse and dependence: data from a national sample. *J Consult Clin Psychol*, 68(1), 19–30. [PubMed: 10710837]
- Knight C, & Wilson K (2016). *Lesbian, gay, bisexual and trans people (LGBT) and the criminal justice system*: Springer.
- Lelutiu-Weinberger C, Pachankis JE, Golub SA, Walker JJ, Bamonte AJ, & Parsons JT (2013). Age cohort differences in the effects of gay-related stigma, anxiety and identification with the gay community on sexual risk and substance use. *AIDS and Behavior*, 17(1), 340–349. [PubMed: 22038078]
- Lepore SJ, & Revenson TA (2006). Resilience and Posttraumatic Growth: Recovery, Resistance, and Reconfiguration In Calhoun LG & Tedeschi RG(Eds.), *Handbook of Posttraumatic Growth: Research & Practice* (pp. 24–46). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.
- Lian-Yu C, Martins SS, Strain EC, Ramin M, & Storr CL (2018). Sex and age differences in risk factors of marijuana involvement during adolescence. *Addictive Disorders & Their Treatment*, 17(1), 29–39. [PubMed: 29651230]
- Lyons A (2015). Resilience in lesbians and gay men: A review and key findings from a nationwide Australian survey. *International Review of Psychiatry*, 27(5), 435–443. [PubMed: 26222668]
- Marshal MP, Friedman MS, Stall R, King KM, Miles J, Gold MA, ... Morse JQ (2008). Sexual orientation and adolescent substance use: A meta-analysis and methodological review. *Addiction*, 103(4), 546–556. [PubMed: 18339100]
- Marshal MP, Friedman MS, Stall R, & Thompson AL (2009). Individual trajectories of substance use in lesbian, gay and bisexual youth and heterosexual youth. *Addiction*, 104, 974–981. [PubMed: 19344440]
- McConnell EA, Janulis P, Phillips I, Truong R, & Birkett M (2018). Multiple minority stress and LGBT community resilience among sexual minority men. *Psychology of sexual orientation and gender diversity*, 5(1), 1. [PubMed: 29546228]
- Miller RL, Boyer CB, Chiaramonte D, Lindeman P, Chutuape K, Cooper-Walker B, & Fortenberry JD (2017). Evaluating Testing Strategies for Identifying Youths With HIV Infection and Linking Youths to Biomedical and Other Prevention Services. *JAMA Pediatrics*.
- Miller RL, Janulis PF, Reed SJ, Harper GW, Ellen J, Boyers CB, & Interventions, t. A. M. T. N. f. H. A. (2016). Creating youth-supportive communities: Outcomes from the Connect-to-Protect (C2P) structural change approach to youth HIV prevention. *J Youth Adolescence*, 45, 301–315.
- Miller RL, Lee K-S, Chiaramonte D, Santiago-Rivera OJ, Acevedo-Polakovich I, Boyer CB, & Ellen JM (2018). Youth health outcomes from the Connect-to-Protect coalitions to prevent adolescent HIV infections. *Vulnerable children and youth studies*, 13(2), 142–157. [PubMed: 29623100]
- Mustanski B, Newcomb M, & Garofalo R (2011). Mental health of gay, lesbian, and bisexual youth: A developmental resiliency perspective. *Journal of Gay and Lesbian Social Services*, 23, 204–225. [PubMed: 21731405]

- Newcomb ME, Heinz AJ, & Mustanski B (2012). Examining risk and protective factors for alcohol use in lesbian, gay, bisexual, and transgender youth: a longitudinal multilevel analysis. *J Stud Alcohol Drugs*, 73, 783–793. [PubMed: 22846242]
- Pan Y, & Jackson RT (2008). Ethnic difference in the relationship between acute inflammation and serum ferritin in US adult males. *Epidemiology & Infection*, 136(3), 421–431. [PubMed: 17376255]
- Patrick ME, & Schulenberg JE (2014). Prevalence and predictors of adolescent alcohol use and binge drinking in the United States. *Alcohol Res*, 35(2), 193–200.
- Peterson D, & P Anfil VAA (2014). *Handbook of LGBT communities, crime, and justice*: Springer.
- Potok M (2010). Anti-gay hate crimes: Doing the math. *Intelligence Report*, 140.
- Reisner SL, Biello K, Perry N, Gamarel KE, & Mimiaga MJ (2014). A compensatory model of risk and resilience applied to adolescent sexual orientation disparities in nonsuicidal self-injury and suicide attempts. *Am J Orthopsychiatr*, 84(5), 545–556.
- Rhodes T (2002). The ‘risk environment’: a framework for understanding and reducing drug-related harm. *International journal of drug policy*, 13(2), 85–94.
- Rhodes T, & Simic M (2005). Transition and the HIV risk environment. *Bmj*, 331(7510), 220–223. [PubMed: 16037463]
- Rutherford A, Zwi AB, Grove NJ, & Butchart A (2007). Violence: A priority for public health? (part 2). *J Epidemiol Community Health*, 61(9), 764–770. [PubMed: 17699529]
- Ryan C, Russell ST, Huebner D, Diaz R, & Sanchez J (2010). Family acceptance in adolescence and the health of LGBT young adults. *J Child Adolesc Psych Nurs*, 23, 205–213.
- Schriner KF, & Fawcett SB (1988). Development and validation of a community concerns report method. *Journal of Community Psychology*, 16, 306–316.
- Singh AA (2017). Understanding Trauma and Supporting Resilience with LGBT People of Color. In *Trauma, Resilience, and Health Promotion in LGBT Patients* (pp. 113–119): Springer
- The United States Department of Justice. (2012). “Defending Childhood” Initiative.
- Thiede H, Valleroy LA, MacKellar DA, & Celentano DD (2003). Regional patterns and correlates of substance use among young men who have sex with men in 7 US urban areas. *American Journal of Public Health*, 93(11), 1915–1921. [PubMed: 14600066]
- Tseloni A, & Pease K (2003). Repeat personal victimization: ‘Boosts’ or ‘flags’? *British J Crimin*, 43, 196–212.
- Wexler LM, DiFluvio G, & Burke TK (2009). Resilience and marginalized youth: Making a case for personal and collective meaningmaking as part of resilience research in public health. *Soc Sci Med*, 69, 565–570. [PubMed: 19596503]
- Widom CS (1998). Childhood victimization: early adversity and subsequent psychopathology In Dohrenwend BP (Ed.), *Adversity, Stress, and Psychopathology* (pp. 81–95). New York, NY: Oxford University Press.
- Williams K, Thomson D, Seto I, & et al. (2012). Standard 6: Age groups for pediatric trials. *Pediatrics*, 129(Suppl 3).
- Woods JB (2017). LGBT identity and crime. *Cal. L. Rev*, 105, 667.
- Zinzow HM, Ruggiero KJ, Hanson RF, Smith DW, Saunders BE, & Kilpatrick DG (2009). Witnessed community and parental violence in relation to substance use and delinquency in a national sample of adolescents. *J Trauma Stress*, 22(6), 525–533. [PubMed: 19885872]

Figure 1.
Moderation of community resources met in the association between crime exposure and the probability of engaging in heavy episodic alcohol use

Figure 2.
Moderation of community resources met in the association between crime exposure and the probability of engaging in recreational drug use

Table 1.

Bivariate comparisons by substance use outcomes among young sexual minority men (N = 720)

	Total	Any Heavy Episodic Alcohol Use	At least Monthly Marijuana Use	Any Drug Use ^a
	N=720	n=224, 31.1%	n=392, 54.4%	n=105, 14.6%
	N (%)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Age				
15 to 17	30 (4.2)	0.19 (0.06, 0.62) ^{**}	1.10 (0.52, 2.30)	0.31 (0.07, 1.35)
18 to 20	367 (51.0)	0.71 (0.52, 0.97) [*]	1.18 (0.88, 1.58)	0.64 (0.42, 0.97) [*]
21 to 24	323 (44.9)	REF	REF	REF
Race/Ethnicity				
Non-Hispanic Black	358 (49.7)	0.56 (0.32, 0.96) [*]	1.32 (0.78, 2.25)	0.46 (0.23, 0.86) [*]
Hispanic/Latinx	189 (26.3)	0.36 (0.22, 0.59) ^{***}	1.21 (0.73, 1.98)	0.37 (0.20, 0.66) ^{**}
Non-Hispanic Other	98 (13.6)	0.51 (0.28, 0.93)	1.43 (0.79, 2.61)	0.34 (0.16, 0.74) ^{**}
Non-Hispanic White	75 (10.4)	REF	REF	REF
Education Attainment				
Greater than 8 th grade	25 (3.5)	0.23 (0.05, 1.07)	0.60 (0.23, 1.52)	0.38 (0.08, 1.79)
Less than high school graduate	69 (9.6)	REF	REF	REF
High school graduate or GED	312 (43.3)	1.28 (0.74, 2.21)	0.71 (0.44, 1.15)	0.89 (0.47, 1.68)
Some college	244 (33.9)	1.70 (0.97, 2.95)	0.59 (0.36, 0.96) [*]	0.82 (0.43, 1.60)
College graduate or greater	70 (9.7)	4.37 (2.22, 8.60) ^{**}	0.34 (0.18, 0.65) [*]	1.09 (0.48, 2.50)
Ever Homeless	253 (35.1)	1.57 (1.15, 2.16) ^{**}	2.63 (1.92, 3.59) ^{***}	2.16 (1.44, 3.25) ^{***}
Sexual Orientation				
Gay	478 (66.4)	REF	REF	REF
Bisexual	198 (27.5)	0.96 (0.67, 1.38)	1.54 (1.10, 2.16) [*]	2.01 (1.29, 3.13) ^{**}
Unsure/Questioning	44 (6.1)	1.14 (0.60, 2.19)	1.39 (0.74, 2.59)	1.98 (0.90, 4.33)
HIV Sexual Risk	1.04 (1.3)	1.33 (1.18, 1.51) ^{**}	1.50 (1.31, 1.72) ^{**}	1.49 (1.28, 1.72) ^{***}
Crime Exposure, past year	187 (26.0)	1.51 (1.06, 2.14) [*]	1.84 (1.30, 2.59) ^{**}	2.19 (1.42, 3.37) ^{***}

	Total	Any Heavy Episodic Alcohol Use	At least Monthly Marijuana Use	Any Drug Use ^a
	N=720	n=224, 31.1%	n=392, 54.4%	n=105, 14.6%
	N (%)	OR (95% CI)	OR (95% CI)	OR (95% CI)
<i>Resource Needs Met, past year</i>	414 (57.5)	0.71 (0.51, 0.97)*	0.80 (0.59, 0.95)*	0.77 (0.51, 0.92)*
<i>Accessed LGBT-welcoming Activities, past year</i>	558 (77.5)	0.90 (0.62, 1.31)	1.37 (0.96, 1.95)	1.40 (0.81, 2.40)
	M (SD)	OR (95% CI)	OR (95% CI)	OR (95% CI)
<i>Perceived Community Support</i>	2.82 (0.82)	1.09 (0.90, 1.33)	0.85 (0.71, 0.98)*	0.84 (0.66, 1.08)

Note: Results are shown from Binary Logistic Generalized Estimating Equation (GEE) Models which account for study site. OR=Odds Ratio. 95% CI=95% Confidence Interval.

^a Any Drug Use = any report of crack, cocaine, heroin, other narcotics, methamphetamine, amphetamine, ecstasy, club drugs, hallucinogens, barbiturates, or inhalants in the last 3 months.

p<0.001;

**
p<0.01;

*
p<0.05

Table 2.

Multivariable logistic generalized estimating equation (GEE) model examining associations between crime exposure, community resilience, and substance use outcomes (N=720)

	Any Heavy Episodic Alcohol Use n=224, 31.1%	At least Monthly Marijuana Use n=392, 54.4%	Any Drug Use ^a n=105, 14.6%
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Age			
15 to 17	0.13 (0.03, 0.55) ^{**}	1.13 (0.51, 2.50)	0.40 (0.09, 1.84)
18 to 20	0.64 (0.46, 0.89) ^{**}	1.13 (0.83, 1.55)	0.64 (0.41, 0.98) [*]
21 to 24	REF	REF	REF
Race/Ethnicity			
Non-Hispanic Black	0.31 (0.18, 0.52) ^{***}	1.05 (0.62, 1.77)	0.30 (0.16, 0.56) ^{***}
Hispanic/Latinx	0.47 (0.26, 0.83) ^{**}	1.12 (0.64, 1.97)	0.37 (0.18, 0.73) ^{**}
Non-Hispanic Other	0.49 (0.26, 0.95) [*]	1.32 (0.70, 2.48)	0.27 (0.11, 0.63) ^{**}
Non-Hispanic White	REF	REF	REF
Education Attainment			
Greater than 8 th grade	--	--	--
Less than high school graduate	REF	REF	REF
High school graduate or GED	1.28 (0.76, 2.21)	0.61 (0.44, 1.12)	0.90 (0.48, 1.68)
Some college	1.70 (0.97, 2.95)	0.59 (0.36, 0.96) [*]	0.82 (0.43, 1.60)
College graduate or greater	4.34 (2.22, 8.60) ^{**}	0.34 (0.18, 0.65) [*]	1.09 (0.48, 2.50)
Ever Homeless	1.51 (1.05, 2.18) [*]	2.30 (1.62, 3.26) ^{***}	1.88 (1.18, 3.02) ^{**}
Sexual Orientation			
Gay	REF	REF	REF
Bisexual	0.95 (0.65, 1.39)	1.31 (0.92, 1.88)	1.90 (1.17, 3.07) ^{**}
Unsure/Questioning	0.92 (0.46, 1.84)	1.18 (0.61, 2.29)	1.53 (0.66, 3.53)
HIV Sexual Risk	1.51 (1.06, 2.14) [*]	1.84 (1.30, 2.59) ^{**}	2.19 (1.42, 3.37) ^{***}
Crime Exposure, past year	1.45 (1.02, 2.14) [*]	1.41 (1.07, 2.04) [*]	1.84 (1.14, 2.98) [*]
Resource Needs Met, past year	0.66 (0.47, 0.93) [*]	0.82 (0.60, 0.98) [*]	0.85 (0.54, 0.96) [*]

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	Any Heavy Episodic Alcohol Use n=224, 31.1%	At least Monthly Marijuana Use n=392, 54.4%	Any Drug Use ^a n=105, 14.6%
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
<i>Accessed LGBT-welcoming activities, past year</i>	0.76 (0.51, 1.14)	1.18 (0.81, 1.72)	1.23 (0.69, 2.18)
<i>Perceived Community Support</i>	0.28 (0.03, 0.58)*	0.97 (0.80, 1.18)	1.01 (0.77, 1.34)

Note: Results are shown from Multivariable Logistic Generalized Estimating Equation (GEE) Models. AOR=Adjusted Odds Ratio. 95% CI=95% Confidence Interval.

^aAny Drug Use = any report of crack, cocaine, heroin, other narcotics, methamphetamine, amphetamine, ecstasy, club drugs, hallucinogens, barbiturates, or inhalants in the last 3 months.

*** p<0.001;
 ** p<0.01;
 * p<0.001

Table 3.

Multivariable logistic generalized estimating equation (GEE) model examining associations between crime exposure, resilience resources, interactions between crime exposure and each indicator of resilience resources, and substance use outcomes (N=720)

	Any Heavy Episodic Alcohol Use n=224, 31.1%	At least Monthly Marijuana Use n=392, 54.4%	Any Drug Use ^a n=105, 14.6%
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Age			
15 to 17	0.12 (0.03, 0.51)	1.08 (0.49, 2.38)	0.40 (0.09, 1.81)
18 to 20	0.61 (0.44, 0.86)	1.12 (0.82, 1.54)	0.63 (0.40, 0.99)*
21 to 24	REF	REF	REF
Race/Ethnicity			
Non-Hispanic Black	0.32 (0.18, 0.54)***	1.11 (0.66, 1.86)	0.30 (0.16, 0.57)***
Hispanic/Latinx	0.49 (0.28, 0.87)*	1.17 (0.67, 2.05)	0.38 (0.19, 0.76)**
Non-Hispanic Other	0.52 (0.26, 0.99)*	1.36 (0.72, 2.56)	0.27 (0.12, 0.65)**
Non-Hispanic White	REF	REF	REF
Education Attainment			
Greater than 8 th grade	--	--	--
Less than high school graduate	REF	REF	REF
High school graduate or GED	1.20 (0.40, 4.21)	0.61 (0.43, 2.01)	0.90 (0.49, 1.38)
Some college	1.70 (0.99, 2.93)	0.59 (0.33, 0.92)*	0.81 (0.30, 2.00)
College graduate or greater	4.34 (2.22, 8.33)**	0.34 (0.18, 0.63)*	1.04 (0.38, 3.38)
Ever Homeless	1.47 (1.01, 2.12)*	2.33 (1.64, 3.31)***	1.82 (1.14, 2.93)*
Sexual Orientation			
Gay	REF	REF	REF
Bisexual	0.95 (0.65, 1.40)	1.29 (0.91, 1.84)	1.93 (1.19, 3.11)**
Unsure/Questioning	0.98 (0.49, 1.97)	1.14 (0.59, 2.11)	1.65 (0.71, 3.84)
HIV Sexual Risk	1.54 (0.99, 2.14)	1.21 (0.99, 2.49)	2.01 (1.29, 2.67)*
Crime Exposure, past year	3.28 (1.26, 8.57)*	1.69 (0.67, 4.24)	4.05 (2.24, 13.27)*
Resource Needs Met, past year	0.56 (0.37, 0.83)**	0.88 (0.61, 1.26)	0.68 (0.39, 1.19)
Accessed LGBT-welcoming activities, past year	0.90 (0.56, 1.48)	1.28 (0.84, 1.96)	1.55 (0.74, 3.25)

	Any Heavy Episodic Alcohol Use n=224, 31.1%	At least Monthly Marijuana Use n=392, 54.4%	Any Drug Use ^a n=105, 14.6%
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
<i>Perceived Community Support</i>	1.12 (0.87, 1.45)	0.96 (0.76, 1.20)	0.95 (0.67, 1.36)
<i>Crime Exposure x Resource Needs Met</i>	0.54 (0.21, 0.83)*	0.22 (0.07, 2.61)	0.54 (0.20, 0.69)*
<i>Crime Exposure x LGBT-welcoming Activities</i>	0.55 (0.21, 1.43)	0.72 (0.29, 1.84)	0.55 (0.17, 1.81)
<i>Crime Exposure x Community Support</i>	1.49 (0.92, 2.40)	1.07 (0.68, 1.69)	1.13 (0.64, 2.00)

Note: Results are shown from Multivariable Logistic Generalized Estimating Equation (GEE) Models. AOR=Adjusted Odds Ratio. 95%CI=95% Confidence Interval.

^a Any Drug Use = any report of crack, cocaine, heroin, other narcotics, methamphetamine, amphetamine, ecstasy, club drugs, hallucinogens, barbiturates, or inhalants in the last 3 months.

*** p<0.001;

** p<0.01;

* p<0.05