



Published in final edited form as:

Arch Sex Behav. 2016 August ; 45(6): 1403–1410. doi:10.1007/s10508-015-0508-2.

Women who use drugs and have sex with women in a Canadian setting: Barriers to treatment enrollment and exposure to violence and homelessness

Tara Lyons^{1,2}, Kate Shannon^{1,2,3}, Lindsey Richardson^{1,4}, Annick Simo¹, Evan Wood^{1,2}, and Thomas Kerr^{1,2,5}

¹British Columbia Centre for Excellence in HIV/AIDS, St. Paul's Hospital, 608-1081 Burrard Street, Vancouver, BC, V6Z 1Y6

²Department of Medicine, University of British Columbia, St. Paul's Hospital, 608-1081 Burrard Street, Vancouver, BC, V6Z 1Y6

³School of Population and Public Health, University of British Columbia, 5804 Fairview Avenue, Vancouver, BC, V6T 1Z3

⁴Department of Sociology, University of British Columbia, 6303 Northwest Marine Drive Vancouver, BC, V6T 1Z1

Abstract

Individuals who use illicit drugs and belong to a sexual minority group often contend with elevated risks for adverse health outcomes. However, little is known about women who use drugs and have sex with women. We therefore sought to identify socio-demographic, substance use patterns, and exposures to social-structural factors associated with reporting sexual activity among women participating in three open prospective cohort studies of individuals who use illicit drugs in Vancouver, Canada. Generalized estimating equations was used to identify substance use patterns, violence and other social and structural drivers of health-related harm among women who reported having sex with women (WSW) between December 2005 and May 2012. In multivariate analyses, younger age (adjusted odds ratio [AOR] = 2.89; 95% confidence interval [CI] = 1.81, 4.60), violence (AOR = 1.78; 95% CI = 1.22, 2.59) and homelessness (AOR = 1.42; 95% CI = 1.00, 2.02) were associated with WSW. WSW were also less likely to report enrollment in addiction treatment (AOR = 0.68; 95% CI = 0.46, 0.99). In a second model, sexual violence (AOR = 3.47; 95% CI = 2.08, 5.78) in the previous 6 months was also found to be positively associated with WSW. These findings indicate a critical need for more thorough understandings of the intersections between sexual relationships, exposure to violence and enrollment in addiction treatment among women who use illicit drugs, as well as the development of programs to address the unique needs of this population.

⁵To whom correspondence should be addressed at B.C. Centre for Excellence in HIV/AIDS, St. Paul's Hospital, 608-1081 Burrard Street, Vancouver, B.C., V6Z 1Y6, Canada; 604-806-9116; uhri-tk@cfenet.ubc.ca.

Keywords

WSW; substance use; treatment; violence; youth; homelessness

INTRODUCTION

Certain populations of sexual minorities (those whose sexual orientation or sexual activities are not strictly heterosexual) contend with high rates of drug-, sexual- and violence-related risks (Bell, Ompad, & Sherman, 2006; Degenhardt, 2005; Herrick, Matthews, & Garofalo, 2010; Marshall et al., 2011). Prior studies have outlined, for example, higher rates of reported substance use among sexual minorities (Hequembourg, Parks, & Vetter, 2008; Marshall et al., 2008; Marshall, et al., 2011; Rosario, 2008). Sexual minority women (SMW), defined as women or girls who identify as lesbian or bisexual or who have sexual relationships with women, report increased rates of violence when compared with their heterosexual counterparts (Goodenow, Szalacha, Robin, & Westheimer, 2008; Hequembourg, et al., 2008). In particular, SMW have an increased likelihood of being coerced into sexual activities (Goodenow, et al., 2008), and they report violence (Friedman et al., 2011) such as shootings (Ompad et al., 2011) at much higher rates (Lhomond & Saurel-Cubizolles, 2006). These findings suggest a complex patterning of substance use and associated risks among SMW and accordingly Ompad and colleagues (2011) suggest that SMW are situated within risk-associated spatial, social and structural environments such as those associated with homelessness and incarceration.

SMW have further been historically under studied, an omission that has created an important gap in the literature and may be attributable to gender- and sexuality-based constructs surrounding HIV/AIDS transmission and heterosexism (cultural belief and behaviour systems that position heterosexuality as the norm while stigmatizing non-heterosexual identities (Herek, 1990)) (Formby, 2011; Lenke & Piehl, 2009). However, SMW often contend with stigma and associated violence, experiences that can elevate risks for adverse health outcomes, including suicidality and mental health issues (Button, 2012; Herek, Chopp, & Strohl, 2007; Poon, Saewyc, & Chen, 2011; Williams & Chapman, 2011). This is especially the case among SMW who use illicit drugs as they face the possibility of exposure to multiple sources of stigma. Yet, in general, in research among individuals who use drugs, the experiences of SMW are not specifically examined or are aggregated with sexual minority men or gender minorities (i.e., transgender populations) (Herrick, et al., 2010). Therefore, we are focusing on a specific group of SMW, women who report having sex with women and who use drugs, to investigate their experiences in an environment characterized by high intensity drug use. Specifically, we sought to identify socio-demographic, substance use patterns, and social-structural exposures associated with women reporting having sex with women among cohort studies of individuals who use illicit drugs in Vancouver, Canada.

METHODS

Study design

Data for these analyses were derived from three open prospective cohort studies of individuals who use illicit drugs in Vancouver, Canada. Detailed sampling and recruitment procedures for each of the three studies have been described previously (Strathdee et al., 1997; Tyndall et al., 2003; Wood, Stoltz, Montaner, & Kerr, 2006). All of the studies involve extensive street-based recruitment and snowball sampling methods, involving self-referral, street outreach and word of mouth, as well as the use of postings within care settings that serve individuals who use drugs. Briefly, the At Risk Youth Study (ARYS) is a cohort of street-involved youth 14 to 26 years of age who are eligible for enrollment if they have used drugs other than cannabis in the previous 30 days. The Vancouver Injection Drug Users Study (VIDUS) is a cohort of HIV-negative adults who inject drugs. To be eligible participants have to have injected an illicit drug in the past 6 months. The AIDS Care Cohort to Evaluate Exposure to Survival Services (ACCESS) is a cohort of HIV-positive individuals who use drugs, and to be eligible for the study individuals must have recently used an illicit drug other than or including cannabis in the previous month. Individuals were eligible for the current analysis if at the time of recruitment they provided written informed consent, lived in the Greater Vancouver region, and were 14 years of age or older.

In all three studies participants complete a detailed interviewer-administered questionnaire at baseline and semi-annually thereafter. The ARYS, ACCESS and VIDUS survey instruments are comprised of a consistent set of questions thereby allowing the aggregation of data across the three cohorts. Also at baseline and at semi-annual intervals, nurses obtain blood specimens for HIV and hepatitis C serological testing and provide pre- and post-test counselling, basic medical services and referrals to health care services. Participants were compensated \$20 (CDN) at each visit for their time. All studies receive annual ethical approval through the Providence Health Care/University of British Columbia Research Ethics Board.

Participants

Study participants included all women participants in ARYS, VIDUS and ACCESS who completed a baseline survey between December 2005 and May 2012. This study utilized baseline and all follow up observations for those enrolled in the study during this period.

Variables

Our primary variable of interest was self-identifying as a woman who has sex with women, defined as reporting having sex with at least one woman in the 6 months prior to interview in response to the question: "In the last 6 months, how many different women have you had sexual activities with, excluding those with whom you had sexual activities with in exchange for money or something else?" The comparison group was comprised of women who reported not having sex with women in the previous 6 months (non-WSW). With regards to terminology, it is understood that sexual practices and sexual identity are distinct and there are women, for example, who identify as heterosexual and have sexual relationships with women (Goodenow, et al., 2008). Therefore, the term women who have sex with women

(WSW) has been used in public health literature to capture sexual practices independently of sexual orientation categories (Bell, et al., 2006; Everett, 2013).

In order to identify potential socio-demographic characteristics, substance use patterns, and social-structural variables associated with WSW, we considered a range of potential covariates based on previous research on SMW's experiences in and outside of drug use settings. Socio-demographic variables included age (youth aged 14 to 21 vs. adults), self-identification of Aboriginal ancestry (First Nations, Métis or Inuit), and high school education (completion of high school or higher vs. no completion of high school). All other variables were binary indicators that refer to activities or experiences in the 6 months prior to interview. Substance use-related variables included heavy alcohol use (>4 drinks per day), injection drug use, binge drug use (use of injection or non-injection drugs more frequently than usual), daily or more frequent use of heroin, cocaine, methamphetamine and crack, and sharing a syringe or pipe. We also included indicators of enrollment in alcohol or drug treatment and unsuccessful attempts to access these services. Variables associated with social-structural risks included homelessness, sex work involvement, police harassment without arrest and incarceration.

Because of previous studies identifying increased exposure to violence among WSW (Lhomond & Saurel-Cubizolles, 2006; Ompad, et al., 2011), we further included self-reported violence and sexual violence in the previous 6 months. Experiences of violence were analyzed using the responses to the question "Have you been attacked, assaulted, or suffered any kind of violence in the last 6 months?" Sexual violence was measured with the question "In the last 6 months have you been forced to have sex or perform a sexual act against your will?" Data from two additional questions were used in order to contextualize incidents of violence according to the perpetrators and types of violence experienced: "Who has attacked you?" and "What type of attack was it?" More than one response was permitted for these additional questions.

Statistical analyses

As a first step, we used Pearson's χ^2 -test to examine to examine the characteristics associated with self-reports of WSW in the 6 months prior to baseline interview. Then, we used generalized estimating equations (GEE) with a logit link and exchangeable correlation structure to determine the factors associated with WSW over the study. GEE models can account for the correlation between the repeated measurements for each participant, allowing for data from every participant follow-up visit to be considered for analysis. We first used GEE bivariate analysis to determine factors associated WSW for the unadjusted analyses. To adjust for potential confounding, all variables that were significant ($p < 0.10$) in GEE bivariate analyses were considered in the multivariate model. A backward model selection procedure using the Quasilikelihood under the Independence model Criterion (QIC) statistic was used to identify the model with the best overall fit, as indicated by the lowest QIC value (Pan, 2001).

Because of our interest in different forms of violence, and sexual violence specifically, we built two multivariate models. The first model focused on violence in general (e.g., physical and/or sexual violence), while the second focused specifically on sexual violence. As a

subanalysis, we used GEE bivariate analysis to examine the characteristics of violent incidents among WSW and non-WSW. Statistical analysis was conducted using SAS software version 9.3 (SAS Institute, Inc., Cary, NC). All p-values are two sided.

RESULTS

In total, 557 women participated in this study between December 2005 and May 2012. Of those, 63 (11.3%) women reported having sex with women in the previous 6 months at baseline, and 107 (19.2%) women reported having sex with at least one woman over the course of the study. The median age of the sample was 30.5 years (interquartile range [IQR] = 20.14) and 34.9% of women who reported having sex with women were of Aboriginal ancestry. The median number of follow-up visits was 7 with IQR of 5 follow-up visits. On average, participants engaged in follow-up visits for 40.17 months, with the median follow-up time period of 37.54 months and an IQR of 36.23 months. Of the 557 women who participated in this study 201 (36.1%) were from ARYS, 196 (35.2%) were from VIDUS, and 160 (28.7%) were from ACCESS cohorts.

As seen in Table 1, WSW at baseline were more likely to report sexual violence (odds ratio [OR] = 8.54; 95% confidence interval [CI] = 3.93, 18.53), homelessness (OR = 2.89; 95% CI = 1.61, 5.18), and heavy alcohol use (OR = 2.01; 95% CI = 1.19, 3.41) and were significantly less likely to report injection drug use (OR = 0.57; 95% CI = 0.34, 0.97). Youth were significantly more likely to report having sex with women (OR = 2.76; 95% CI = 1.61, 4.74). There were no significant differences in Aboriginal ancestry or high school education.

In bivariate GEE analyses shown in Table 2, WSW had significantly greater odds of being between 14 and 21 years of age (OR = 4.13; 95% CI = 2.67, 6.38), reporting heavy alcohol use (OR = 2.12; 95% CI = 1.50, 3.00), homelessness (OR = 1.97; 95% CI = 1.43, 2.71) and sharing a syringe or a pipe (OR = 1.44; 95% CI = 1.03, 2.01) in the previous 6 months. WSW were also more likely to report sexual violence (OR = 4.38; 95% CI = 2.61, 7.36), violence (OR = 2.22; 95% CI = 1.58, 3.11), incarceration (OR = 1.52; 95% CI = 1.04, 2.23) and police harassment without arrest (OR = 1.51; 95% CI = 1.08, 2.11). WSW were significantly less likely to report attendance at an addiction treatment program (OR = 0.57; 95% CI = 0.41, 0.80) and significantly more likely to report unsuccessful attempts to access an addiction treatment program (OR = 1.69; 95% CI = 1.09, 2.60). There were no significant differences in the illicit drug use patterns between WSW and non-WSW, including injection drug use, binge drug use, daily use of heroin, cocaine, methamphetamine and crack. There were also no significant differences in sex work involvement.

In multivariate GEE analyses also shown in Table 2, younger age (<22 years) (adjusted odds ratio [AOR] = 2.89; 95% CI = 1.81, 4.60), violence (AOR = 1.78; 95% CI = 1.22, 2.59) and homelessness (AOR = 1.42; 95% CI = 1.00, 2.02) were positively associated with reporting sex with women. Women who reported sex with women were also significantly less likely to report enrollment in addiction treatment (AOR = 0.68; 95% CI = 0.46, 0.99). In the second multivariate model, sexual violence (AOR = 3.47; 95% CI = 2.08, 5.78) was positively associated with WSW with the other covariates yielding similar results, as seen in Table 2.

In subanalyses examining the perpetrators of violent incidents and the type of violence experienced by women, (Table 3), WSW were more likely than non-WSW to report strangers (12.5% vs. 5.4%, $p=0.006$), acquaintances (9.2% vs. 3.8%, $p=0.003$), police officers (2.6% vs. 0.7%, $p=0.009$) and security guards (0.7% vs. 0.1%, $p=0.037$) as the perpetrators of violence. WSW were significantly more likely than non-WSW to report being beaten (23.7% vs. 11.2%, $p=0.001$) and strangled (2.0% vs. 0.5%, $p=0.035$).

DISCUSSION

This study focused on a particular group of sexual minority women; women report having sex with women and who use drugs. Over the course of the study period, 19.2% of women in the sample reported having sex with women, which is similar to findings in other studies of WSW in drug use settings. For example, Bayoumi and colleagues (2012) found of women who use drugs in Toronto, ON and Ottawa, ON, 16% and 17% respectively reported having sex with at least one woman in the previous 6 months and 13% of participants of 15 to 30 year olds who used drugs in Baltimore, MD identified as WSW (Bell, et al., 2006). In the final multivariate models, WSW in our study were more likely to be younger than 22 years of age and were more likely to report sexual violence and violence in the previous 6 months. While there were no differences in substance use patterns, WSW were less likely than non-WSW to report enrollment in addiction treatment in the 6 months prior to interview. There were no differences in patterns of sex work, incarceration, or police harassment without arrest between WSW and non-WSW.

There are a number of plausible explanations for our finding that WSW were more likely to be younger than non-WSW. It may be more common for young women to report having sex with women compared to older women in our sample due to increasing acceptance of a range of sexual behaviours and identities among younger populations. Additionally, identifying as a sexual minority can result in stigma and marginalisation from families and as a result previous studies have documented a disproportionate number of sexual minority youth who are homeless (Coker, Austin, & Schuster, 2010; Rosario, Schrimshaw, & Hunter, 2012; Worthington, 2008). In this study, homelessness was significantly associated with WSW, indicating that this group of women may also face discrimination in accessing housing or housing services.

There were no significant differences in substance use among our sample. This is an important finding given the ongoing debate in the literature on substance use among SMW. Earlier studies that found SMW to report higher rates of substance use have been critiqued for methodological flaws including sampling strategies focused on bars and the absence of or use of inappropriate control groups (Bux, 1996; Green & Feinstein, 2012; Meyer & Wilson, 2009). More recent studies have produced mixed results (Button, 2012; Degenhardt, 2005; T. Hughes, Szalacha, & McNair, 2010). We focused on a specific SMW population, WSW in a drug use setting, which may explain some of the differences compared to previous studies.

While there were no significant differences in drug use, WSW in our study were less likely to report attending addiction treatment in the previous 6 months. Previous research has

found that sexual minority populations are more likely to access addiction treatment services (Grella, Greenwell, Mays, & Cochran, 2009; T. L. Hughes, 2003). However, these studies did not focus on high-intensity drug use environments such as that in the current study, and may also have looked at demographically different populations. The current study suggests that generalized barriers to accessing health care among SMW may extend to access to addiction treatment services as well. These results may be attributable, as has been found in previous studies, to barriers specific to their sexual activities in attempting to access addiction treatment service such as exposure to violence or discrimination from other participants (Travers & Schneider, 1996), to women being less likely to enter treatment (Greenfield et al., 2007), and/or to a lack of women-specific drug treatment programs (Greenfield & Grella, 2009; Simpson & McNulty, 2008). Given inconsistent results related to treatment uptake and access among SMW, future research would do well to consider potential sources of confounding such as age and exposure to drug use settings.

These findings reveal WSW in this drug use setting experience alarmingly elevated levels of violence and sexual violence compared to non-WSW. The characteristics of violent incidents were also different between WSW and non-WSW. Specifically, WSW were significantly more likely to report being attacked most often by strangers, acquaintances, police officers and security guards and they were significantly more likely to report being beaten and strangled than women who did not report having sex with women. WSW are situated within cultures and practices of homophobia and heterosexism. Therefore they may be more vulnerable to violence due to homophobic and heterosexist stigma, policies, and practices, such as being removed from a housing shelter for their sexual activities. Our results support the literature documenting SMW's experience of elevated levels of physical and sexual violence (Friedman, et al., 2011; Hequembourg, et al., 2008; Lehavot, Molina, & Simoni, 2012; Williams & Chapman, 2011). For example, in a study of street youth in Toronto, sexual minority girls reported higher rates of physical and sexual violence than their heterosexual peers (Gaetz, O'Grady, & Buccieri, 2010). Thus, our findings add further evidence that SMW and girls face tremendous physical and sexual violence in their lives and WSW in high-intensity drug use settings may face additional risks for physical and sexual violence.

Given that SMW are often overlooked in substance use and addiction treatment research, these findings begin to fill a gap in our understanding of the experiences and exposures specific to WSW in drug use settings. In particular, findings of escalated levels of physical and sexual violence as well as barriers accessing addiction treatment programs highlight specific needs and challenges faced by these women in critical areas of health and service provision. The study findings call for addiction treatment and health and housing services designed specifically to meet the needs of WSW. The results of this study suggest that WSW face specific challenges and therefore, further investigations into the unique experiences of WSW, and other SMW, in drug use settings are warranted.

As with any study, the current analysis has a number of limitations. First, the study populations of the ARYS, VIDUS and ACCESS cohorts are not random samples and therefore may not be generalizable to other drug use settings. Second, the data used in this analysis were based on self-report and may have been susceptible to response biases, which

may include an underreporting of violence or other activities or exposures considered in these analyses. Additionally, we excluded women who exchanged sex for money or goods and this group may face additional exposures to violence through criminalization. Therefore, our estimates of violence among WSW may be conservative. Fourth, while we used longitudinal data, these results represent statistical association and cannot be used to infer casual pathways or relationships. Fifth, it is important to acknowledge the heterogeneity of women who have sex with women and to note the study sample cannot be assumed to represent all WSW. The sample is also not generalizable to lesbian and bisexual women or to SMW outside of drug use settings. Finally, differentiating between WSW and women who have sex with both women and men was not accounted for in this study and there may be important differences between these populations that our analyses overlooked. Thus, future research could usefully examine whether drug use patterns and social-structural exposures differ according to the gender of intimate partners among WSW and other populations of SMW.

In summary, the results of our study suggest that WSW in this Canadian drug use setting are at increased risk of exposure to physical and sexual violence compared to their non-WSW counterparts. The results also suggest WSW have unique experiences and challenges in accessing housing and addiction treatment programs. While there are increasing numbers of specific treatment programs for sexual and gender minorities, there are few treatment programs available for SMW and treatment outcomes of these programs remain understudied (Green & Feinstein, 2012). Therefore, interventions tailored to the unique needs of WSW in drug use settings are required, with a particular focus on treatment, violence, and sexual assault prevention and housing services. In addition, qualitative inquiries investigating the experiences of WSW and other SMW in housing environments and alcohol and drug treatment are necessary to explore the mechanisms that produce and address potential barriers to services. SMW have been historically disregarded or grouped with sexual minority men and/or gender minorities and this study indicates a critical need for better understandings of WSW and the intersections and their sexual relationships, housing, violence, and treatment experiences.

REFERENCES

- Bayoumi, AM.; Strike, C.; Jairam, J.; Watson, T.; Enns, E.; Kolla, G.; Brandeau, M. Report of the Toronto and Ottawa Supervised Consumption Assessment Study. Toronto, Ontario: St. Michael's Hospital and the Dalla Lana School of Public Health, University of Toronto; 2012. p. 324
- Bell AV, Ompad D, Sherman SG. Sexual and drug risk behaviors among women who have sex with women. *American Journal of Public Health*. 2006; 96(6):1066–1072. [PubMed: 16670234]
- Button DM. Sexual Minority Youth Victimization and Social Support: The Intersection of Sexuality, Gender, Race, and Victimization. *Journal of Homosexuality*. 2012; 59(1):18–43. [PubMed: 22269046]
- Bux DA. The epidemiology of problem drinking in gay men and lesbians: A critical review. *Clinical Psychology Review*. 1996; 16(4):277–298.
- Coker TR, Austin SB, Schuster MA. The Health and Health Care of Lesbian, Gay, and Bisexual Adolescents. *Annual review of public health*. 2010; 31(1):457–477.
- Degenhardt L. Drug use and risk behaviour among regular ecstasy users: Does sexuality make a difference? *Culture, Health & Sexuality*. 2005; 7(6):599–614.

- Everett BG. Sexual Orientation Disparities in Sexually Transmitted Infections: Examining the Intersection Between Sexual Identity and Sexual Behavior. *Archives of sexual behavior*. 2013; 42(2):225–236. [PubMed: 22350122]
- Formby E. Lesbian and bisexual women's human rights, sexual rights and sexual citizenship: negotiating sexual health in England. *Culture, Health & Sexuality*. 2011; 13(10):1165–1179.
- Friedman MS, Marshal MP, Guadamuz TE, Wei C, Wong CF, Saewyc EM, Stall R. 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*. 2011; 101(8):1481–1494. [PubMed: 21680921]
- Gaetz, S.; O'Grady, B.; Buccieri, K. *Surviving crime and violence: Street youth and victimization in Toronto*. Toronto, ON: Justice for Children and Youth; 2010. p. 90
- Goodenow C, Szalacha LA, Robin LE, Westheimer K. Dimensions of sexual orientation and HIV-related risk among adolescent females: evidence from a statewide survey. *American Journal of Public Health*. 2008; 98(6):1051–1058. [PubMed: 18445809]
- Green KE, Feinstein BA. Substance use in lesbian gay bisexual populations: An update on empirical research and implications for treatment. *Psychology of Addictive Behaviors*. 2012; 26(2):265–278. [PubMed: 22061339]
- Greenfield SF, Brooks AJ, Gordon SM, Green CA, Kropp F, McHugh RK, Miele GM. Substance abuse treatment entry, retention, and outcome in women: A review of the literature. *Drug and alcohol dependence*. 2007; 86(1):1–21. [PubMed: 16759822]
- Greenfield SF, Grella CE. What is "women-focused" treatment for substance use disorders? *Psychiatric services*. 2009; 60(7):880–882. [PubMed: 19564216]
- Grella C, Greenwell L, Mays V, Cochran S. Influence of gender, sexual orientation, and need on treatment utilization for substance use and mental disorders: Findings from the California Quality of Life Survey. *BMC Psychiatry*. 2009; 9(1):52. [PubMed: 19682355]
- Hequembourg AL, Parks KA, Vetter C. Sexual identity and gender differences in substance use and violence: An exploratory study. *Journal of LGBT Issues in Counseling*. 2008; 2(3):174–198.
- Herek GM. The Context of Anti-Gay Violence: Notes on Cultural and Psychological Heterosexism. *Journal of Interpersonal Violence*. 1990; 5(3):316–333.
- Herek, GM.; Chopp, R.; Strohl, D. Sexual Stigma: Putting Sexual Minority Health Issues in Context. In: Meyer, I.; Northridge, M., editors. *The Health of Sexual Minorities*. US: Springer; 2007. p. 171–208.
- Herrick AL, Matthews AK, Garofalo R. Health risk behaviors in an urban sample of young women who have sex with women. *Journal of Lesbian Studies*. 2010; 14(1):80–92. [PubMed: 20077268]
- Hughes T, Szalacha LA, McNair R. Substance abuse and mental health disparities: Comparisons across sexual identity groups in a national sample of young Australian women. *Social Science & Medicine*. 2010; 71(4):824–831. [PubMed: 20579794]
- Hughes TL. Lesbians' Drinking Patterns: Beyond the Data. *Substance Use & Misuse*. 2003; 38(11–13):1739–1758. [PubMed: 14582576]
- Lehavot K, Molina Y, Simoni J. Childhood Trauma, Adult Sexual Assault, and Adult Gender Expression among Lesbian and Bisexual Women. *Sex Roles*. 2012; 67(5–6):272–284. [PubMed: 24003263]
- Lenke K, Piehl M. Women Who have Sex with Women in the Global HIV Pandemic. *Development*. 2009; 52(1):91–94.
- Lhomond B, Saurel-Cubizolles M-J. Violence against women and suicide risk: The neglected impact of same-sex sexual behaviour. *Social Science & Medicine*. 2006; 62(8):2002–2013. [PubMed: 16174545]
- Marshal MP, Friedman MS, Stall R, King KM, Miles J, Gold MA, Morse JQ. Sexual orientation and adolescent substance use: a meta-analysis and methodological review. *Addiction*. 2008; 103(4):546–556. [PubMed: 18339100]
- Marshall BDL, Wood E, Shoveller JA, Patterson TL, Montaner JSG, Kerr T. Pathways to HIV risk and vulnerability among lesbian, gay, bisexual, and transgendered methamphetamine users: a multi-cohort gender-based analysis. *BMC Public Health*. 2011; 11(20)

- Meyer IH, Wilson PA. Sampling lesbian, gay, and bisexual populations. *Journal of Counseling Psychology*; *Journal of Counseling Psychology*. 2009; 56(1):23. doi: 0.1037/a0014587.
- Ompad DC, Friedman SR, Hwahng SJ, Nandi V, Fuller CM, Vlahov D. HIV risk behaviors among young drug using women who have sex with women (WSWs) in New York City. *Substance Use & Misuse*. 2011; 46(2–3):274–284. [PubMed: 21303247]
- Pan W. Akaike's information criterion in generalized estimating equations. *Biometrics*. 2001; 57(1): 120–125. doi: Retrieved from <http://www.jstor.org/stable/2676849>. [PubMed: 11252586]
- Poon C, Saewyc E, Chen W. Enacted Stigma, Problem Substance Use, and Protective Factors among Asian Sexual Minority Youth in British Columbia. *Canadian Journal of Community Mental Health*. 2011; 30(2):47–64. doi: Retrieved from <http://cjcmh.com/toc/cjcmh/30/2>.
- Rosario M. Elevated substance use among lesbian and bisexual women: Possible explanations and intervention implications for an urgent public health concern. *Substance Use & Misuse*. 2008; 43(8–9):1268–1270. [PubMed: 18649245]
- Rosario M, Schrimshaw E, Hunter J. Homelessness Among Lesbian, Gay, and Bisexual Youth: Implications for Subsequent Internalizing and Externalizing Symptoms. *Journal of youth and adolescence*. 2012; 41(5):544–560. [PubMed: 21656284]
- Simpson M, McNulty J. Different needs: Women's drug use and treatment in the UK. *International Journal of Drug Policy*. 2008; 19(2):169–175. [PubMed: 18155515]
- Strathdee SA, Patrick DM, Currie SL, Cornelisse PG, Rekart ML, Montaner JS, O'Shaughnessy MV. Needle exchange is not enough: lessons from the Vancouver injecting drug use study. *AIDS*. 1997; 11:1291–1304. doi: Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/9223727>. [PubMed: 9256948]
- Travers R, Schneider M. Barriers to accessibility for lesbian and gay youth needing addictions services. *Youth & Society*. 1996; 27(3):356–378.
- Tyndall M, Currie S, Spittal P, Li K, Wood E, O'Shaughnessy MV, Schechter MT. Intensive injection cocaine use as the primary risk factor in the Vancouver HIV-1 epidemic. *AIDS*. 2003; 17(6):887–893. doi: 0.1097/01.aids.0000050859.71999.ae. [PubMed: 12660536]
- Williams KA, Chapman MV. Comparing health and mental health needs, service use, and barriers to services among sexual minority youths and their peers. *Health & Social Work*. 2011; 36(3):197–206. [PubMed: 21936333]
- Wood E, Stoltz J-A, Montaner J, Kerr T. Evaluating methamphetamine use and risks of injection initiation among street youth: the ARYS study. *Harm Reduction Journal*. 2006; 3(1):18. [PubMed: 16723029]
- Worthington, CM.; Bruce; Huffey, Nedra; Dittmann, Dawn; Kitt, Olivia; Patten, San; Leech; Jessica. Final Report. Calgary, AB: University of Calgary; 2008. Calgary Youth, Health and the Street.

Table 1

Baseline socio-demographic characteristics, substance use patterns and structural exposures of 557 women who use illicit drugs in Vancouver, Canada, (2005–2012)

Characteristic	WSW ^{a †} 63 (11.31%)	Non-WSW [†] 494 (88.69%)	Odds Ratio (95% CI ^b)	p - value
Youth (<22 years)				
Yes	28 (44.4)	111 (22.5)	2.76 (1.61 – 4.74)	<0.001
Aboriginal ancestry [*]				
Yes	22 (34.9)	200 (40.5)	0.79 (0.46 – 1.37)	0.396
Homelessness [†]				
Yes	46 (73.0)	239 (48.4)	2.89 (1.61 – 5.18)	<0.001
High school education ^{**}				
Yes	24 (38.1)	185 (37.5)	1.03 (0.60 – 1.76)	0.920
Heavy alcohol use ^{† ‡}				
Yes	34 (54.0)	182 (36.8)	2.01 (1.19 – 3.41)	0.010
Any daily heroin [†]				
Yes	17 (27.0)	143 (29.0)	0.91 (0.50 – 1.64)	0.746
Daily crack use [†]				
Yes	27 (42.9)	206 (41.7)	1.05 (0.62 – 1.78)	0.861
Injection drug use [†]				
Yes	32 (50.8)	318 (64.4)	0.57 (0.34 – 0.97)	0.037
Drug/alcohol treatment [†]				
Yes	24 (38.1)	214 (43.3)	0.81 (0.47 – 1.38)	0.431
Barriers to treatment [†]				
Yes	8 (12.7)	38 (7.7)	1.75 (0.78 – 3.93)	0.179
Sex work involvement [†]				
Yes	19 (30.2)	155 (31.4)	0.94 (0.53 – 1.67)	0.844
Police harassment without arrest [†]				
Yes	18 (28.6)	126 (25.5)	1.17 (0.65 – 2.09)	0.601
Incarceration [†]				
Yes	9 (14.3)	80 (16.2)	0.86 (0.41 – 1.82)	0.697
Sexual violence [†]				
Yes	14 (22.2)	16 (3.2)	8.54 (3.93 – 18.53)	<0.001

^aWSW is defined as women who reported having sex with at least one woman,

^bCI = confidence

* Aboriginal ancestry is defined as self-report of First Nations, Inuit or Métis ancestry,

[†]In the last 6 months,

** completion of high school education or higher vs. no completion of high school

\neq >4 drinks per day on average

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2

Bivariate and multivariate GEE analysis of factors associated with women reporting having sex with women (WSW) compared to non-WSW ($n=557$)

Characteristic	Unadjusted	Adjusted (violence)	Adjusted (sexual violence)
	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)
Youth (<22 years)			
(yes vs. no)	4.13 (2.67 – 6.38) ^a	2.89 (1.81 – 4.60) ^a	3.00 (1.90 – 4.76) ^a
Aboriginal ancestry [*]			
(yes vs. no)	0.63 (0.39 – 1.01)	-	-
Homelessness [†]			
(yes vs. no)	1.97 (1.43 – 2.71) ^a	1.42 (1.00 – 2.02) ^b	1.42 (1.00 – 2.03) ^b
Education ^{**}			
(yes vs. no)	0.96 (0.61 – 1.52)	-	-
Heavy alcohol use ^{††}			
(yes vs. no)	2.12 (1.50 – 3.00) ^a	1.43 (0.99 – 2.08)	1.38 (0.95 – 2.01)
Injection drug use [†]			
(yes vs. no)	0.77 (0.56 – 1.07)	-	-
Binge drug use [†]			
(yes vs. no)	1.31 (0.99 – 1.74)	-	-
Any daily heroin [†]			
(yes vs. no)	1.13 (0.78 – 1.62)	-	-
Any daily cocaine [†]			
(yes vs. no)	0.66 (0.34 – 1.29)	-	-
Daily methamphetamine [†]			
(yes vs. no)	1.50 (0.79 – 2.84)	-	-
Daily crack use [†]			
(yes vs. no)	0.93 (0.68 – 1.28)	-	-
Share syringe or pipe [†]			
(yes vs. no)	1.44 (1.03 – 2.01) ^b	1.35 (0.92 – 1.98)	1.39 (0.95 – 2.03)
Police harassment without arrest [†]			
(yes vs. no)	1.51 (1.08 – 2.11) ^b	-	-
Incarceration [†]			
(yes vs. no)	1.52 (1.04 – 2.23) ^b	-	-
Sex work involvement [†]			
(yes vs. no)	1.11 (0.77 – 1.58)	-	-
Drug/alcohol treatment [†]			
(yes vs. no)	0.57 (0.41 – 0.80) ^b	0.68 (0.46 – 0.99) ^b	0.62 (0.42 – 0.90) ^b

Characteristic	Unadjusted	Adjusted (violence)	Adjusted (sexual violence)
	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)
Barriers to treatment [†]			
(yes vs. no)	1.69 (1.09 – 2.60) ^b	-	-
Violence [†]			
(yes vs. no)	2.22 (1.58 – 3.11) ^a	1.78 (1.22 – 2.59) ^b	Excluded
Sexual violence [†]			
(yes vs. no)	4.38 (2.61 – 7.36) ^a	Excluded	3.47 (2.08 – 5.78) ^a

* Aboriginal ancestry is defined as self-report of First Nations, Inuit or Métis ancestry,

[†] In the last 6 months,

** completion of high school education or higher vs. no completion of high school,

[‡] >4 drinks per day on average,

^a <0.001,

^b <0.05

Table 3Characteristics of violent incidents ($n=2621$)

Characteristic	WSW ($n=152$)	non-WSW ($n=2469$)	<i>p</i> -value
Perpetrator of violence			
Stranger	19 (12.5%)	133 (5.4%)	0.006
Acquaintance	14 (9.2%)	93 (3.8%)	0.003
Dealer	1 (0.7%)	16 (0.7%)	0.814
Police	4 (2.6%)	16 (0.7%)	0.009
Boy/girlfriend	5 (3.3%)	44 (1.8%)	0.322
Partner	2 (1.3%)	17 (0.7%)	0.787
Regular sex partner	1 (0.7%)	2 (0.1%)	0.072
Security guard	1 (0.7%)	2 (0.1%)	0.037
Sex worker	1 (0.7%)	5 (0.2%)	0.978
Other	3 (2.0%)	51 (2.1%)	0.782
Type of violence			
Beating	36 (23.7%)	276 (11.2%)	0.001
Strangled	3 (2.0%)	11 (0.5%)	0.035
Sexual assault/rape	3 (2.0%)	26 (1.1%)	0.486
Robbery	2 (1.3%)	27 (1.1%)	0.525
Attacked with weapons	5 (3.3%)	38 (1.5%)	0.153
Other	8 (5.3%)	50 (2.0%)	0.035