Title

Correlates of Suicidality Among A Community-Based Cohort of Women Sex Workers: The Protective Effect of Social Cohesion

Journal

Journal of Interpersonal Violence, 36(19-20)

ISSN

0886-2605

Authors

Argento, Elena
Strathdee, Steffanie A
Shoveller, Jean A
et al.

Publication Date

2021-10-01

DOI

10.1177/0886260519870167

Peer reviewed

HHS Public Access

Author manuscript

J Interpers Violence. Author manuscript; available in PMC 2022 October 01.

Published in final edited form as:

J Interpers Violence. 2021 October ; 36(19-20): 9709–9724. doi:10.1177/0886260519870167.

Correlates of suicidality among a community-based cohort of women sex workers: The protective effect of social cohesion

Elena Argento[1,2], **Steffanie A. Strathdee**[3], **Jean A. Shoveller**[1,4], **Melissa Braschel**[1], **Kate Shannon**[1,4]

[1]Centre for Gender & Sexual Health Equity, Vancouver, BC, Canada

[2]Interdisciplinary Studies Graduate Program, University of British Columbia, Vancouver, BC, Canada

[3]Department of Medicine, University of California San Diego, La Jolla, CA, USA

[4]Faculty of Medicine, University of British Columbia, Vancouver, BC, Canada

Abstract

Background: Suicide is a critical public health concern globally. Sex workers experience a disproportionate burden of social and health inequities driven by forms of violence, stigma, and criminalization, yet empirical research on suicidality is limited. This study longitudinally investigated the burden and socio-structural correlates of recent suicidality among women sex workers in Vancouver, Canada.

Methods: Data (2010–2017) were drawn from a community-based, prospective cohort of cis and trans women sex workers across Metro Vancouver. Women completed biannual interviewer-administered questionnaires and correlates of suicidality in the last six months were analyzed using bivariate and multivariable logistic regression with generalized estimating equations (GEE).

Results: Of 867 women at baseline, 48% (n=413) reported lifetime suicidality, 16% (n=141) reported suicidality in the last six months, and 29% reported suicidality at some point during the study. In multivariable analysis, factors independently associated with suicidality included: physical/sexual childhood abuse (adjusted odds ratio [AOR] 2.99; 95% CI 1.75–5.10), mental health issues (depression/anxiety/post-traumatic stress disorder) (AOR 2.19; 95% CI 1.63–2.95), intimate partner violence (AOR 2.11; 95% CI 1.60–2.80), physical/sexual client violence (AOR 1.82; 95% CI 1.33–2.50), and homelessness (AOR 1.44; 95%CI 1.10–1.89). Older age (AOR 0.97; 95% CI 0.95–0.99) and higher social cohesion (AOR 0.88; 95% CI 0.78–0.99) were significantly associated with reduced odds of suicidality.

Implications: Findings reveal key socio-structural correlates of suicidality among sex workers including experiences of historical and interpersonal violence, trauma/mental health issues, and homelessness. Strengthening social cohesion may have a protective effect on suicidality. Trauma-

Send correspondence to: Kate Shannon, PhD, MPH, Professor, Department of Medicine, University of British Columbia, Director, Centre for Gender & Sexual Health Equity, 1190 Hornby Street, Vancouver, B.C., V6Z 2K5, Canada, dr.shannon@cgshe.ubc.ca.

Competing interests: None.

Ethical approval: This study holds ethical approval through Providence Health Care/University of British Columbia Research Ethics Board.

informed community-led structural interventions tailored to sex workers are urgently needed alongside a legal framework that enables collectivization and connectedness.

Keywords

women; sex workers; suicidality; suicide prevention; violence; mental health

Introduction

Suicide is a critical and complex public health challenge globally (Hawton & van Heeringen, 2009; World Health Organization, 2014). It has been estimated that 1 million people die each year from suicide; one person commits suicide every 40 seconds (World Health Organization, 2014). An estimated 80–90% of suicide deaths are attributable to mental health or substance use disorders, which were directly responsible for 8.6 million years of life lost (YLLs) to premature mortality globally in 2010, equivalent to 232,000 deaths (Statistics Canada, 2015; Whiteford et al., 2013). However, there remains a paucity of empirical research and evidence on suicidality among marginalized populations, such sex workers. Many marginalized, including street-involved sex workers continue to face multiple forms of violence and trauma driven by a matrix of interrelated socio-structural factors (Shannon et al., 2015; Ulibarri et al., 2013) that significantly elevate risk of psychological distress and suicidality (Gu et al., 2014; Roxburgh, Degenhardt, & Copeland, 2006; Zhang et al., 2016). Suicide prevention and intervention programs have been largely absent for women sex workers who experience disproportionately elevated risks and harms, such as violence, poverty, stigma, discrimination, criminalization, and social exclusion (Argento et al., 2014; Benoit, Carroll, & Chaudhry, 2003; Deering et al., 2014; Shannon et al., 2015).

Suicidality is a complex phenomenon involving a convergence of individual, social, cultural, and environmental factors combined with experiences of trauma and loss (Hawton & van Heeringen, 2009; O'Connor & Nock, 2014; Zalsman et al., 2016), although depression has been identified as one of the strongest correlates of suicidality (Center for Addiction and Mental Health, 2011; Klonsky, May, & Saffer, 2016). Of the limited available data among sex workers, research indicates that a history of violence, childhood abuse, and unaddressed mental health issues (e.g., depression, post-traumatic stress disorder [PTSD]) may elevate risk of suicidality, particularly among women who work in street-based settings with fewer health and social supports (Gu et al., 2014; Lau, Tsui, Ho, Wong, & Yang, 2010; Roxburgh et al., 2006; Shahmanesh et al., 2009; Surratt, Kurtz, Chen, & Mooss, 2012; Zhang et al., 2016). Trans individuals and trans women sex workers in particular, experience considerable psychosocial challenges due to entrenched stigma and discrimination, and report elevated risk and rates of suicidality (Bourgois & Schonberg, 2009; Nemoto, Boedeker, & Iwamoto, 2011). Further, Indigenous women are vastly overrepresented among street-based sex workers in North America (Benoit et al., 2003; Bingham, Leo, Zhang, Montaner, & Shannon, 2014). Due to generations of racialized policies and social and cultural disconnection, Indigenous women experience comparatively higher risks and rates of poverty, HIV infection, substance use, trauma and suicidality (Benoit et al., 2003; Bingham et al., 2014; Clifford, Doran, & Tsey, 2013). Suicide rates among Indigenous

peoples in Canada are two to three times higher than the general population (Clifford et al., 2013).

Substantial research and evidence demonstrate that criminalization and punitive approaches to sex work contribute to a lack of social and health protections (e.g., community empowerment, legal protections against violence, access to services), which ultimately undermines the health needs and human rights of sex workers (Argento et al., 2016; Csete & Cohen, 2010; Shannon et al., 2015). Violence against sex workers is largely shaped by the criminalized nature of sex work and contemporaneous stigma, discrimination, and social marginalization, which lead to increased physical risks and harms (e.g., injury, death, HIV) as well as poor mental health and emotional wellbeing (e.g., depression, anxiety, PTSD, addiction issues) for sex workers globally (Decker et al., 2015; Deering et al., 2014; Shannon et al., 2015; World Health Organization, 2013, 2014). Criminalization also hinders the ability of sex workers to collectivize, which is critical to building capacity and enabling sex workers to negotiate safer working conditions, prevent violence, and improve access to health services and supports (Argento et al., 2016; Blanchard et al., 2013; Fonner et al., 2014; Kerrigan et al., 2015). As such, numerous public health experts, international bodies, and sex work communities worldwide have endorsed full decriminalization of sex work (Amnesty International, 2015; Global Commission on HIV and the Law, 2012; World Health Organization, 2012).

The socio-structural correlates of suicidality remain poorly understood, and stigma continues to hamper research and prevention efforts among marginalized women. Thus, the objective of the present study was to estimate the prevalence and identify socio-structural correlates of recent suicidality among a longitudinal cohort of women sex workers in Metro Vancouver, Canada.

Methods

Study Design and Sample

Data were drawn from a community-based, prospective open cohort of women sex workers, known as AESHA (An Evaluation of Sex Workers Health Access), between January 2010 and August 2017. As previously described (Shannon et al., 2007), the AESHA study is based on partnerships between sex work agencies and community service providers since 2004 and has expanded to include women sex workers across Metro Vancouver working in both street and off-street settings. AESHA is monitored by a Community Advisory Board of over 15 women's health, sex work, and HIV service agencies, as well as representatives from the health authority and policy experts. The AESHA study holds ethical approval through Providence Health Care/University of British Columbia Research Ethics Board. The research team works in close partnership with the affected community and a diversity of stakeholders, including legal/human rights experts, community-based organizations, service providers, health authorities, government officials, international policy bodies and regularly engages in knowledge exchange efforts. Experiential staff (current and former sex workers) and individuals with substantial community experience in sex work support services are represented across the AESHA interview, outreach, and nursing teams. All participants received an honorarium of $40 at each bi-annual visit for their time, expertise and travel.

Eligibility criteria for participants at baseline included cis or trans women, 14 years of age or older, and having exchanged sex for money within the last 30 days. Due to the hidden and marginalized nature of sex work, women were recruited through community mapping and systematic time-location sampling (Stueve, Duran, Doval, & Blome, 2001) based on place of work. The AESHA outreach team includes both current and former sex workers. Women were recruited through day and late-night outreach to both outdoor (i.e. streets, alleys) and indoor sex work venues (i.e. massage parlors, micro-brothels, and in-call locations), and online. A combination of outreach methods and contact by mobile phone and Internet were used for follow-up.

Participants completed interviewer-administered questionnaires and voluntary HIV/STI/HCV serology testing at enrollment and biannually. Enrollment was ongoing and participants completed a maximum of 15 visits for the present study. Overall, 4008 observations on 867 women were included and the median number of study visits completed by participants was 3 (interquartile range [IQR]: 1 to 7). The main questionnaire elicits responses related to socio-demographics (e.g., sexual and gender identities, ethnicity, education, housing), the work environment (e.g., access to services, safety, policing), client interactions (e.g., types/fees of services, client condom use), intimate partner relationships (e.g., sexual history, cohabitation, financial support), and violence and trauma exposures (e.g., lifetime and childhood trauma, intimate partner violence, workplace violence). The clinical questionnaire relates to overall physical, mental, and emotional health, and HIV testing and treatment experiences to support education, referral, and linkages with care.

Study Variables

The dependent outcome of interest was recent suicidality, defined as responding ‘yes’ to having thought about or attempted suicide in the last six months. All data were self-reported and time-updated at each follow-up with the last six months as the reference, with the exception of time-fixed demographic variables considered at baseline: trans/gender minority, sexual minority (lesbian, gay, bisexual, queer, two-spirit, asexual), self-identification of Indigenous ancestry (inclusive of First Nations, Metis, and Inuit), being a migrant or new immigrant worker (versus Canadian born), and physical and/or sexual childhood abuse (before age 18). Time-updated variables included individual-level factors and those that reflect the social environment: age, HIV seropositivity, recent homelessness, recent injection and non-injection drug use, mental health issues (having ever been diagnosed with, treated for, or received counseling for depression, anxiety or PTSD), work-related variables (e.g., primary place to solicit and service clients, police harassment, being arrested or put in jail), experiences of violence (e.g. physical/sexual violence by clients or police, any physical/sexual/emotional intimate partner violence), and social cohesion, captured using a continuous social cohesion scale (standardized with a mean of zero and standard deviation of one, with a higher score indicating greater social cohesion). Social cohesion was scored using an adapted scale first developed by Lippman, Kerrigan and colleagues that measures levels of perceived mutual aid, trust, solidarity and support within the community (Lippman et al., 2010). The scale has been previously adapted and validated with sex workers in low- and middle-income countries and among sex workers by our group in Canada (Argento et

al., 2016; Duff et al., 2015; Fonner et al., 2014; Kerrigan, Telles, Torres, Overs, & Castle, 2008).

Statistical Analyses

Descriptive statistics at baseline were calculated for independent variables of interest, stratified by recent suicidality. Differences were assessed using the Wilcoxon rank-sum test for continuous variables and Pearson's chi-square test (or Fisher's exact test for small cell counts) for categorical variables. Correlates of recent suicidality were examined using bivariate and multivariable generalized estimating equations (GEE) with a logit link for the dichotomous outcome. To adjust the standard error and account for correlations between repeated measurements on the same participant over the follow-up, an exchangeable correlation matrix was used. Variables that were significantly correlated with suicidality at the $p<0.05$ level in bivariate analyses were subsequently fitted into a multivariable GEE model. Manual backward stepwise selection was used to identify the most parsimonious and best fitting model, as indicated by the lowest quasi-likelihood under the independence model criterion. Analyses were restricted to observations where participants reported actively engaging in sex work in the last six months, and a complete case analysis was used such that observations with any missing data were removed. Two-sided p-values and unadjusted and adjusted odds ratios (OR and AOR) with 95% confidence intervals (95%CI) were generated. All statistical analyses were performed using SAS software version 9.4 (SAS Institute, Cary, NC, USA).

Results

Descriptive results

A total of 867 women completed the baseline questionnaire between January 2010 and August 2017. Baseline socio-structural characteristics among women who reported recent suicidality compared to those who did not are displayed in Table 1. Within the study sample, 38% (n=333) identified as Indigenous, 34% (n=297) identified as a sexual minority, and 6% (n=54) identified as trans. The median age of the sample at baseline was 35 years (IQR: 28 to 42). Nearly one third (30%; n=263) of women reported being homeless in the last six months, which was significantly more prevalent among those who reported suicidality than those who did not (46% vs. 27%; $p<0.001$). In terms of experiences of violence and trauma, physical and/or sexual abuse (before age 18) was reported by 67% (n=584) of women in the study, and this was significantly higher among those who reported suicidality than those who did not (91% vs. 63%; $p<0.001$). Recent bad dates (physical/sexual violence by clients) were reported by nearly one-fifth (18%; n=156) of women at baseline, as was recent intimate partner violence (any physical, sexual or emotional violence) (19%; n=163), both of which were significantly higher among women with suicidality ($p<0.001$). Mental health issues (ever been diagnosed with, treated for, or received counseling for depression, anxiety or PTSD) were reported by 42% (n=365) of women.

Overall, 48% (n=413) reported any lifetime suicidality at baseline (46% [n=400] reported lifetime suicidal ideation; 33% [n=289] reported lifetime suicide attempts). At baseline, 16% (n=141) of women reported suicidality in the last six months, with 29% reporting suicidality

at some point during the study. Of a total 4008 observations, there were 486 (12%) reports of suicidality over follow-up.

Bivariate and multivariable GEE analyses

Longitudinal bivariate associations and adjusted odds ratios for independent correlates of recent suicidality are displayed in Table 2. In the final multivariable GEE model, factors independently associated with recent suicidality included physical and/or sexual childhood abuse (adjusted odds ratio [AOR] 2.99; 95% CI 1.75–5.10), mental health issues (depression, anxiety, or post-traumatic stress disorder [PTSD]) (AOR 2.19; 95% CI 1.63–2.95), recent intimate partner violence (AOR 2.11; 95% CI 1.60–2.80), recent physical and/or sexual violence by clients (AOR 1.82; 95% CI 1.33–2.50), and recent homelessness (AOR 1.44; 95%CI 1.10–1.89). Older age (AOR 0.97; 95% CI 0.95–0.99) and higher social cohesion (AOR 0.88; 95% CI 0.78–0.99) were significantly associated with reduced odds of suicidality.

Discussion

Findings from this study demonstrate that suicidality is highly prevalent among women sex workers in this setting – nearly half reported lifetime suicidality at baseline, highlighting a critical public health concern that warrants further attention. Factors independently associated with recent suicidality in this study included physical/sexual childhood abuse as well as recent experiences of interpersonal violence. Notably, results indicate that social cohesion among sex workers had an independent protective effect on suicidality. Specifically, for every one standard deviation increase from the mean social cohesion score, the odds of suicidality decreased by 12% (p=0.036). The present study is among the first prospective analyses to examine the prevalence and correlates of suicide risk among sex workers in high-income settings worldwide. Given the dearth of epidemiological research examining suicide risk among marginalized populations, this study underscores the urgent need to scale-up innovative and evidence-based prevention and intervention strategies tailored to women sex workers.

Rates of suicidality vary substantially between settings and populations, with large gaps in research and reporting of suicidality among sex workers globally. Of the available data on suicidality among sex workers, most are cross-sectional and have been conducted in Australia and lower/middle-income settings such as in China and India, with prevalence rates ranging from 19–74% (Gu et al., 2014; Lau et al., 2010; Roxburgh et al., 2006; Shahmanesh et al., 2009). Research on suicidality among sex workers in North America remains largely absent. Of the limited available evidence, previous research conducted in the United States examined causes of mortality in a 30-year open cohort of nearly 2000 women sex workers and found that suicide accounted for 4.5% of deaths (Brody, Potterat, Muth, & Woodhouse, 2005; Potterat et al., 2004), as compared to 1.4% among the general population (Nock et al., 2008; World Health Organization, 2014). Among 573 trans women with a history of sex work in California, 74% reported lifetime suicidal ideation and 64% had attempted suicide (Nemoto et al., 2011).

Ongoing stigma and systematic discrimination against sex workers continue to hamper efforts to advance research and interventions to reduce risk of suicidality, particularly among women who operate in environments that criminalize aspects of the sex work industry (Bruckert & Hannem, 2013; Decker et al., 2015; Lazarus et al., 2012). Global evidence clearly demonstrates that sex workers' ability to access essential social, health, and legal protections (e.g., against violence) is severely compromised in settings where sex work is criminalized (Csete & Cohen, 2010; Shannon et al., 2015). New legislation in Canada, known as the "Protection of Communities and Exploited Persons Act" (PCEPA), criminalizes the buying and advertising of sex, and has serious implications for the health, safety and wellbeing of sex workers (Krüsi et al., 2014). As previously mentioned, criminalization of sex work reduces the ability of sex workers to collectivize, which can be a powerful determinant of health (Argento et al., 2016; Kerrigan et al., 2015; Lippman et al., 2010; Shannon et al., 2015). As evidenced in the present analysis, social cohesion among workers significantly reduced the odds of suicidality. Evidence from other settings (e.g., USA) suggests that high rates of depression and PTSD are both a product of and exacerbated by social isolation, stigma, and repeated violence and lack of recourse as a result of criminalized approaches to sex work (Nemoto et al., 2011; Surratt et al., 2012). In contrast, in New Zealand where sex work has been decriminalized, sex workers have experienced better access to health services and workplace safety (Abel, Fitzgerald, & Brunton, 2009).

Overall, multifaceted social (e.g., partner violence, social marginalization and homelessness) and structural (e.g., laws, policies) inequities contribute to elevated risk of suicidality among sex workers. Some forms of cognitive behavioral therapy and pharmacological interventions have been evidenced to reduce depression and risk of suicide, yet the literature is hampered by stigma, publication bias and inconsistencies in strategies and outcome measures (O'Connor & Nock, 2014; Zalsman et al., 2016). While depression is strongly correlated with suicidality, data from a systematic review and meta-analysis suggest that psychotherapy targeting depression cannot be considered a sufficient treatment for suicidality (Cuijpers et al., 2013). Research and empirical evidence among sex worker populations remains largely absent and necessitates further investigation. There is an urgent need for trauma-informed care tailored to women sex workers, as well as integrated violence and couples-based interventions to address high rates of violent victimization and abuse. Mitigating risk of suicidality also necessitates targeting socio-structural factors including housing and reform of laws and policies that perpetuate stigma/discrimination, violence, and unequal access to health and social support services for sex workers. There remains an urgent need for community-led interventions that facilitate collectivization and empowerment among sex workers to improve human rights, health, and overall wellbeing.

Limitations

There are several limitations to this study that should be considered. Several variables examined involved highly stigmatized and sensitive topics (e.g., childhood abuse, trauma, partner violence, drug use), which may have resulted in under-reporting or respondent-driven reporting biases by participants. However, the community-based nature of the study reduced the likelihood of such biases, as interviews were conducted in safe and comfortable

spaces by experienced interviewers (including by current and former sex workers) with strong community rapport. All data were self-reported and questions pertaining to events that occurred in the past may be subject to recall bias. The definition of suicidality in the study refers to suicidal ideation or attempts and does not include completed suicides, which introduces the potential for survivorship bias. Based on our study's linkages to vital statistics no completed suicides were observed during the study period. A major strength of this study is the prospective design and use of GEE analyses, which increased statistical power and allowed for average estimates of the correlates of recent suicidality over the study period to be determined. Social cohesion was measured on a 5-point Likert scale from 2010–2013 and was revised to a 4-point Likert scale from 2014 onward in order to reflect the scale developed by Lippman, et al (Lippman et al., 2010). The scale was standardized as a z-score to account for this change. Findings may not be fully generalizable to other sex worker populations and women working more independently (e.g., escorts, online) may have been underrepresented. However, the mapping of working areas and time-location sampling likely helped to ensure a representative sample and to minimize selection bias.

Conclusion

Findings reveal key socio-structural correlates of suicidality among sex workers, including experiences of historical and interpersonal violence, trauma/mental health issues, and homelessness. Strengthening social cohesion among workers may have a protective effect on suicidality. This study highlights the urgent need for trauma-informed community-led structural interventions tailored to sex workers alongside a legal framework that enables collectivization and connectedness.

Acknowledgments:

We thank all those who contributed their time and expertise to this project, particularly participants, AESHA community advisory board members and partner agencies, and the AESHA team, including: Sarah Moreheart, Jennifer Morris, Sylvia Machat, Jane Li, Minshu Mo, Sherry Wu, Sylvia Machat, Emily Leake, Anita Dhanoa, Meaghan Thumath, Alka Murphy, Jenn McDermid, Tave Cole, Jaime Adams. We also thank Abby Rolston, Peter Vann, Erin Seatter and Patricia McDonald for their research and administrative support.

Funding: This research is supported by the US National Institutes of Health (NIH) (R01DA028648), a Canadian Institutes of Health Research (CIHR) Foundation Grant, and MacAIDS. KS is partially supported by a Canada Research Chair in Global Sexual Health and HIV/AIDS, NIH, and Michael Smith Foundation for Health Research. SAS is supported by a NIDA MERIT Award (R37DA019829). EA is supported by a Canadian Institutes of Health Research Doctoral Award.

References

Abel GM, Fitzgerald LJ, & Brunton C (2009). The Impact of Decriminalisation on the Number of Sex Workers in New Zealand. Journal of Social Policy, 38 (03), 515–531.

Amnesty International. (2015). Sex Worker's Rights are Human Rights. Retrieved from https://www.amnesty.org/en/latest/news/2015/08/sex-workers-rights-are-human-rights/

Argento E, Duff P, Bingham B, Chapman J, Nguyen P, Strathdee SA, & Shannon K (2015). Social cohesion among sex workers and client condom refusal in a Canadian setting: Implications for structural and community-led interventions. AIDS and Behavior, 1–9. [PubMed: 24668254]

Argento E, Muldoon K, Duff P, Simo A, Deering K, & Shannon K (2014). High prevalence and partner correlates of physical and sexual violence by intimate partners among street and off-street sex workers. PLOS ONE, 9(7), e102129. [PubMed: 25010362]

Benoit C, Carroll D, & Chaudhry M (2003). In search of a Healing Place: Aboriginal women in Vancouver's Downtown Eastside. Social Science and Medicine, 56(4), 821–833. [PubMed: 12560015]

Bingham B, Leo D, Zhang R, Montaner J, & Shannon K (2014). Generational sex work and HIV risk among Indigenous women in a street-based urban Canadian setting. Culture, Health & Sexuality, 16(4), 440–452.

Bourgois P, & Schonberg J (2009). Righteous Dopefiend. Berkeley: University of California Press.

Brody S, Potterat JJ, Muth SQ, & Woodhouse DE (2005). Psychiatric and characterological factors relevant to excess mortality in a long-term cohort of prostitute women. Journal of Sex and Marital Therapy, 31(2), 97–112. [PubMed: 15859370]

Center for Addiction and Mental Health. (2011). Suicide Prevention and Assessment Handbook. Toronto, ON. Retrieved from papers3://publication/uuid/E20B95DF-C102-4001-B984-FBB3031ACCB1

Clifford AC, Doran CM, & Tsey K (2013). A systematic review of suicide prevention interventions targeting indigenous peoples in Australia, United States, Canada and New Zealand. BMC Public Health, 13(463), 1–11. [PubMed: 23280303]

Csete J, & Cohen J (2010). Health benefits of legal services for criminalized populations: The case of people who use drugs, sex workers and sexual and gender minorities. Journal of Law, Medicine and Ethics, 38 (4), 816–831.

Cuijpers P, De Beurs DP, Van Spijker BAJ, Berking M, Andersson G, & Kerkhof AJFM (2013). The effects of psychotherapy for adult depression on suicidality and hopelessness: A systematic review and meta-analysis. Journal of Affective Disorders, 144(3), 183–190. [PubMed: 22832172]

Deering KN, Amin A, Shoveller JA, Nesbitt A, Garcia-Moreno C, Duff P, … Shannon K (2014). A systematic review of the global magnitude and drivers of violence against sex workers. American Journal of Public Health, 104(5), e42–e54.

Duff P, Shoveller JA, Dobrer S, Ogilvie G, Montaner J, Chettiar J, & Shannon K (2015). The relationship between social, policy and physical venue features and social cohesion on condom use for pregnancy prevention among sex workers: A safer indoor work environment scale. Journal of Epidemiology & Community Health, 1–7.

Fonner VA, Kerrigan D, Mnisi Z, Ketende S, Kennedy CE, & Baral S (2014). Social cohesion, social participation, and HIV related risk among female sex workers in Swaziland. PLOS ONE, 9(1), e87527. [PubMed: 24498125]

Global Commission on HIV and the Law. (2012). Risks, Rights & Health. New York. Retrieved from http://www.hivlawcommission.org/

Gu J, Lau JTF, Li M, Li H, Gao Q, Feng X, … Hao Y (2014). Socio-ecological factors associated with depression, suicidal ideation and suicidal attempt among female injection drug users who are sex workers in China. Drug and Alcohol Dependence, 144, 102–110. [PubMed: 25236890]

Hawton K, & van Heeringen K (2009). Suicide. The Lancet, 373(9672), 1372–1381.

Kerrigan D, Telles P, Torres H, Overs C, & Castle C (2008). Community development and HIV/STI-related vulnerability among female sex workers in Rio de Janeiro, Brazil. Health Education Research, 23(1), 137–145. [PubMed: 17363361]

Klonsky ED, May AM, & Saffer BY (2016). Suicide, Suicide Attempts, and Suicidal Ideation. Annual Review of Clinical Psychology, 12(1), 307–330.

Krüsi A, Pacey K, Bird L, Taylor C, Chettiar J, Allan S, … Shannon K (2014). Criminalisation of clients: reproducing vulnerabilities for violence and poor health among street-based sex workers in Canada: A qualitative study. BMJ Open, 4(e005191).

Lau JTF, Tsui HY, Ho SPY, Wong E, & Yang X (2010). Prevalence of psychological problems and relationships with condom use and HIV prevention behaviors among Chinese female sex workers in Hong Kong. AIDS Care, 22(6), 659–668. [PubMed: 20467945]

Lippman S, Donini A, Diaz J, Chinaglia M, Reingold A, & Kerrigan D (2010). Social-environmental factors and protective sexual behavior among sex workers: the Encontros intervention in Brazil. American Journal of Public Health, 100(S1), S216–S223. [PubMed: 19762673]

Nemoto T, Boedeker B, & Iwamoto M (2011). Social support, exposure to violence and transphobia, and correlates of depression among male-to-female transgender women with a history of sex work. American Journal of Public Health, 101(10), 1980–1988. [PubMed: 21493940]

Nock MK, Borges G, Bromet EJ, Cha CB, Kessler RC, & Lee S (2008). Suicide and suicidal behavior. Epidemiologic Reviews, 30(1), 133–154. [PubMed: 18653727]

O'Connor RC, & Nock MK (2014). The psychology of suicidal behaviour. The Lancet Psychiatry, 1(1), 73–85. [PubMed: 26360404]

Potterat JJ, Brewer DD, Muth SO, Rothenberg RB, Woodhouse DE, Muth JB, … Brody S (2004). Mortality in a long-term open cohort of prostitute women. American Journal of Epidemiology, 159(8), 778–785. [PubMed: 15051587]

Roxburgh A, Degenhardt L, & Copeland J (2006). Posttraumatic stress disorder among female street-based sex workers in the greater Sydney area, Australia. BMC Psychiatry, 6(24), 1–12. [PubMed: 16396684]

Shahmanesh M, Wayal S, Cowan F, Mabey D, Copas A, & Patel V (2009). Suicidal behavior among female sex workers in Goa, India: The silent epidemic. American Journal of Public Health, 99(7), 1239–1246. [PubMed: 19443819]

Shannon K, Bright V, Allinott S, Alexson D, Gibson K, & Tyndall MW (2007). Community-based HIV prevention research among substance-using women in survival sex work: the Maka Project Partnership. Harm Reduction Journal, 4(20).

Shannon K, Strathdee SA, Goldenberg SM, Duff P, Mwangi P, Rusakova M, … Boily MC (2015). Global epidemiology of HIV among female sex workers: Influence of structural determinants. Lancet, 385, 55–71. [PubMed: 25059947]

Statistics Canada. (2015). Suicide Rates: An Overview. Health at a Glance. Ottawa. Retrieved from http://www.statcan.gc.ca/pub/82-624-x/2012001/article/11696-eng.htm

Stueve A, Duran R, Doval AS, & Blome J (2001). Time-space sampling in minority communities: results with young Latino men who have sex with men. American Journal of Public Health, 91(6), 922–926. [PubMed: 11392935]

Surratt HL, Kurtz SP, Chen M, & Mooss A (2012). HIV risk among female sex workers in Miami: the impact of violent victimization and untreated mental illness. AIDS Care, 24(5), 553–561. [PubMed: 22085330]

Ulibarri MD, Hiller SP, Lozada R, Rangel MG, Stockman JK, Silverman JG, & Ojeda VD (2013). Prevalence and characteristics of abuse experiences and depression symptoms among injection drug-using female sex workers in Mexico. Journal of Environmental and Public Health, 1–11.

Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, … Vos T (2013). Global burden of disease attributable to mental and substance use disorders: Findings from the Global Burden of Disease Study 2010. The Lancet, 382(9904), 1575–1586.

World Health Organization. (2012). Prevention and Treatment of HIV and Other Sexually Transmitted Infections for Sex Workers in Low- and Middle-Income Countries. Geneva. Retrieved from http://www.who.int/hiv/pub/guidelines/sex_worker/en/index.html

World Health Organization. (2014). Preventing Suicide: A Global Imperative. Geneva, Switzerland. Retrieved from http://www.who.int/mental_health/suicide-prevention/world_report_2014/en/

Zalsman G, Hawton K, Wasserman D, van Heeringen K, Arensman E, Sarchiapone M, … Zohar J (2016). Suicide prevention strategies revisited: 10-year systematic review. The Lancet Psychiatry, 3(7), 646–659. [PubMed: 27289303]

Zhang L, Li X, Wang B, Shen Z, Zhou Y, Xu J, … Bonita S (2016). Violence, stigma and mental health among female sex workers in China: a structural equation modeling. Women & Health, 57(6), 685–704. [PubMed: 27230586]

Table 1:

Baseline socio-structural characteristics of women sex workers who reported suicidality in the last six months, compared to those who did not (N=867)

Characteristic	Reported recent suicidality		p-value
	Yes n=141 (16.3%)	No n=726 (83.7%)	
Age (median, IQR)	33 (26 to 41)	35 (29 to 43)	0.005
Gender minority/trans	20 (14.2)	34 (4.7)	0.001
Sexual minority	63 (44.7)	234 (32.2)	0.005
Indigenous ancestry	64 (45.4)	269 (37.1)	0.064
Born in Canada	125 (88.7)	492 (67.8)	<0.001
HIV seropositivity	19 (13.5)	102 (14.1)	0.903
Homelessness†	65 (46.1)	198 (27.3)	<0.001
Standardized social cohesion score† (median, IQR)	−0.06 (−0.66 to 0.61)	0.18 (−0.54 to 0.91)	0.026
Depression, anxiety, or PTSD*	95 (67.4)	270 (37.2)	<0.001
Non-injection drug use†	122 (86.5)	447 (61.6)	<0.001
Injection drug use†	82 (58.2)	265 (36.5)	<0.001
Physical/sexual childhood abuse	128 (90.8)	456 (62.8)	<0.001
Physical/sexual client violence†	48 (34.0)	108 (14.9)	<0.001
Any intimate partner violence†	57 (40.4)	106 (14.6)	<0.001
Police harassment†	55 (39.0)	227 (31.3)	0.076
Arrested/put in jail†	10 (7.1)	40 (5.5)	0.466
Primary place to solicit clients †			
Street/public space	91 (64.5)	344 (47.4)	
Indoor/in-call venue	21 (14.9)	236 (32.5)	
Independent/self-advertising (e.g., newspapers, online)	28 (19.9)	138 (19.0)	<0.001
Primary place to service clients †			
Outdoor/public space	71 (50.4)	269 (37.1)	
Informal indoor (e.g., bars, hotels, saunas, client's place)	50 (35.5)	193 (26.6)	
Formal in-call (e.g., brothel, massage parlour)	17 (12.1)	249 (34.3)	<0.001

† In last 6 months

* Ever diagnosed with, treated for, or received support for depression, anxiety or PTSD

Table 2:

Unadjusted and adjusted odds ratios for correlates of recent suicidality among women sex workers in Vancouver, 2010–2017 (N=867)

Characteristic	Unadjusted Odds Ratio (95%CI)	p-value	Adjusted Odds Ratio (95%CI)	p-value
Age (per year older)	0.96 (0.95 to 0.98)	<0.001	0.97 (0.95 to 0.99)	0.002
Gender minority/trans	2.41 (1.50 to 3.88)	0.003		
Sexual minority	1.92 (1.44 to 2.56)	<0.001		
Indigenous ancestry	1.51 (1.13 to 2.01)	0.005		
Born in Canada	4.38 (2.74 to 7.00)	<0.001		
HIV seropositivity	1.11 (0.75 to 1.65)	0.590		
Homelessness†	1.57 (1.26 to 1.96)	<0.001	1.44 (1.10 to 1.89)	0.008
Higher social cohesion (per standard deviation from the mean)†	0.83 (0.75 to 0.92)	<0.001	0.88 (0.78 to 0.99)	0.036
Depression, anxiety, or PTSD†*	2.47 (1.90 to 3.21)	<0.001	2.19 (1.63 to 2.95)	<0.001
Non-injection drug use†	1.77 (1.33 to 2.35)	<0.001		
Injection drug use†	1.75 (1.39 to 2.21)	<0.001		
Physical/sexual childhood abuse	5.85 (3.61 to 9.49)	<0.001	2.99 (1.75 to 5.10)	<0.001
Physical/sexual client violence†	2.25 (1.75 to 2.90)	<0.001	1.82 (1.33 to 2.50)	<0.001
Any intimate partner violence†	2.38 (1.88 to 3.02)	<0.001	2.11 (1.60 to 2.80)	<0.001
Police harassment†	1.29 (1.05 to 1.59)	0.017		
Arrested/put in jail†	1.88 (1.12 to 3.14)	0.017		
Primary place to solicit clients †				
Indoor venue (vs. street)	0.59 (0.43 to 0.81)	0.001		
Independent** (vs. street)	0.83 (0.67 to 1.02)	0.077		
Primary place to service clients †				
Informal indoor** (vs. outdoor)	0.73 (0.60 to 0.89)	0.002		
Formal in-call** (vs. outdoor)	0.32 (0.21 to 0.49)	<0.001		

† Time-updated, last 6 months as reference

* Ever diagnosed with, treated for, or received support for depression, anxiety or PTSD

** Independent includes self-advertising (e.g., newspapers, online); Informal indoor includes bars, hotels, saunas, and client's place; Formal in-call includes brothels and massage parlours