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Overdose among mothers: The association between child removal and unintentional drug overdose in a longitudinal cohort of marginalised women in Canada

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Abstract

Background—Accidental overdose is a major public health concern in North America with research primarily focused on cisgender men. Little is known about the burden of overdose among marginalised women, particularly in the context of child custody loss. This study aims to examine the prevalence of overdose and the association with child removal in a cohort of marginalised women.

Methods—This study draws on a merged dataset (2010–2018) of two community-based longitudinal cohorts of over 1000 marginalised women in Canada recruited using time-location sampling. After restricting to women who had ever had a live birth, bivariate and multivariable logistic regression using generalised estimating equations (GEE) were used to examine the association between child removal and overdose. Joint effects of child removal and Indigeneity were also investigated.

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Author statement

The first author named is lead and corresponding author. All other authors are listed in order of contribution with the last author being the parent study principal investigator and senior author. We describe contributions to the paper using the CRediT taxonomy (Brand et al. (2015), Learned Publishing 28(2)). Writing – Original Draft: MT; Writing – Review & Editing: KS, DH, JB, MB, PD, SP, BB; Conceptualisation: MT, KS, SP and DH; Investigation: MT, KS, MB.; Methodology: MT, DH, JB, KS, MB, PD.; Formal Analysis: MT and MB; Project Administration: KS; Funding Acquisition: KS and MT.

Declaration of Competing Interest

The authors declare no conflict of interest.

Results—Of the 696 women who reported ever having a live birth, 39.7% (n = 276) reported child removal at baseline. Unintended, non-fatal overdose rates were high, with 35.1% (n = 244) of women reporting ever having an overdose. Using bivariate GEE analyses, having a child apprehended and being Indigenous were positively correlated with overdose. Using multivariable GEE, child removal increased the odds of overdose by 55% (AOR: 1.55; 95% CI 1.01–2.39) after adjusting for education and Indigenous ancestry. Using multivariable joint-effects analysis, Indigenous women who had experienced child removal had over twice the odds of an unintended overdose than non-Indigenous women who had not lost custody after adjusting for education, food insecurity, and sex work (AOR: 2.09; 95% CI 1.15–3.79).

Conclusion—This analysis suggests that, after controlling for known confounders, women who have a child removed experience higher odds of overdose, and these odds are highest among Indigenous women. The high prevalence of overdose in this cohort suggests the need for further strategies to prevent overdose among pregnant and parenting women.

Keywords

Substance use; Canada; Overdose; Maternal health; Child welfare

BACKGROUND

Accidental overdose is a major public health concern in North America, and little is known about the burden of overdose among marginalised women and, in particular, those who have experienced losses such as a child removal. The overdose crisis has now claimed more deaths than motor vehicle accidents and firearms in the United States and accounts for more daily deaths than motor vehicle collisions in Canada (Barnett, Gray, Zink & Jena, 2017; Belzak & Halverson, 2018). In 2019, Statistics Canada reported that life expectancy rates have stopped increasing for the first time in four decades due to opioid-related overdose deaths. Death rates due to overdose were 2.1 times higher for men and 1.6 times higher for women in 2017 compared with 2015 (Statistics Canada, 2019). The same report found the crisis to be most urgent in the Canadian province of British Columbia (B.C.), where in 2016, the provincial health officer declared a public health emergency in response to the rise in unintentional illicit drug overdose deaths from 211 in 2010 to 1547 in 2018 and 984 in 2019 (BC Coroners Service, 2020). While men have experienced more absolute overdose deaths, fatal overdoses among women have increased by 260–500% among women aged 30–64 in the United States between 1999 and 2017 (VanHouten, Rudd, Ballesteros & Mack, 2019). In the Canadian context, overdose events and deaths are experienced differently by various communities and identities such as ethnicity and gender. Specifically, in B.C., First Nations people represent 3.4% of the population but 14% of all overdose events and are three times more likely to die due to an overdose compared to their non-First Nations counterparts (First Nations Health Authority, 2017). First Nations women, when compared to non-First Nations women, are 8 times more likely to experience overdose events and 5 times more likely to die due to overdose (First Nations Health Authority, 2017).

Research and policy on the overdose crisis has primarily been focused on cisgender men, and less is known about the impact on women, particularly marginalised women such as sex workers and women living with HIV (Collins, Bardwell, McNeil & Boyd, 2019; VanHouten

et al., 2019). Amongst a cohort of women living with HIV in Canada, approximately 17% of participants self-reported opioid or stimulant use, with higher rates of substance use (26.4%) reported amongst women experiencing intersecting health, social, and structural inequities(Shokoohi, Bauer, Kaida, Logie, Lacombe-Duncan, Milloy et al., 2019).

The lack of attention to the unique overdose risk of women is particularly troubling given that drug use is gendered and people who are marginalised due to their female gender or gender diverse identify are differentially impacted by Hepatitis C and HIV transmission, physical and sexual violence and injection related harms when compared to cisgender men (Collins et al., 2019; Shannon, Goldenberg, Deering & Strathdee, 2014). The concept of marginalization, in contrast to terms such as “vulnerable” or “at-risk”, generally refers to the root causes of poor access to basic human rights and social dislocation (Browne & Reimer-Kirkham, 2014). Marginalised populations have been defined in various ways in human rights legislation in Canada but broadly include socially identifiable groups that experience systemic social or economic disadvantage on the basis of poverty, source of income, occupation, housing status, and/or level of education. People who use drugs (PWUDs), Indigenous and other racialised people, gender and sexual minorities (LGBTQ), people living on low incomes, sex workers, immigrants, and refugees tend to experience this type of systemic social or economic disadvantage (Public Health Agency of Canada, 2011). Historical and contemporary colonial structures have led to Indigenous women being particularly overrepresented among marginalised and street involved populations (Aguiar & Halseth, 2015; First Nations Health Authority, 2019; Martin & Walia, 2019; Reading, 2015).

Women who are criminalised (e.g. sex workers, drug users, and women living with HIV) and have been marginalised by poverty, race, substance use, and mental illness also experience a disproportionate burden of monitoring and apprehension by child welfare authorities in North America (Blackstock, Clarke, Cullen, D’Hondt & Formsma, 2004; Kenny, Barrington & Green, 2015). In many cases, these women were also former children in care themselves (Blackstock, 2004). Since the 1950s in Canada, women who are racialised and women who experience poverty or who use illicit substances have been deemed unfit mothers and have customarily experienced child apprehension (Boyd, 2019; Kenny et al., 2015). Prohibitionist drug policies in Canada, as elsewhere, influence child welfare policies such that abstinence is equated with “good parenting” while parental substance use is equated with abuse (Boyd, 2019, p. 11; Boyd, 1999). As a consequence, drug policy can supersede the reproductive and human rights of women, including their right to raise their children (Boyd, 2019).

Little is known, however, about the complex impact of child removal on women’s health. Even less is known about the potential risk factors for maternal overdose. Of particular concern is the possible effect of a traumatic event, such as an unplanned child removal at birth on a woman who may be vulnerable to relapse, postpartum depression, and suicide (Thornton, Schmied, Dennis, Barnett & Dahlen, 2013). Qualitative research with mothers has found that exposure to the removal of children by child welfare authorities can result in high levels of maternal posttraumatic stress, grief, depression, stigma, and poorer physical health (Barrow & Laborde, 2008; Farahzad, 2016; Kyzer, Conners-Burrow & McKelvey, 2014; Raskin, 1992). A discordant sibling analysis in Manitoba found that mothers who had a child taken into care had higher rates of mortality due to avoidable causes (HR 3.46; 95%

CI 1.41–8.48) (Wall-Wieler, Roos, Nickel, Chateau & Brownell, 2018). Outside of the Manitoba study, little is known about the quantitative effects of child removal on maternal health and wellness.

In Canada, an estimated 65,000 children are currently in the care of child welfare authorities at a population rate of between 1.1% and 3% of children, one of the highest rates in the world (Gilbert et al., 2012; Trocmé, Esposito, Nutton, Rosser & Fallon, 2019). Due to historical colonial child welfare policies and their influence on contemporary child welfare structures, Indigenous children are overrepresented in the Canadian child welfare system (Blackstock, 2006; John, 2016; Martin & Walia, 2019; Trocmé et al., 2019). While comprising only 7.7% of the population under the age of 14, around 52.2% of children under the age of 14 in foster homes are Indigenous (Canada, 2018; John, 2016). The term “cultural genocide” is used in the Truth and Reconciliation Commission (TRC) report to refer to Canada’s laws and policies aimed at Indigenous peoples, inclusive of the ‘Sixties Scoop’, a time when provinces placed Indigenous children in care at higher rates than residential school (John, 2016; Truth & Reconciliation Commission, 2015).

There are limited interventions available currently to address the trauma that is associated with child removal and to prevent related morbidity and mortality for women experiencing such loss (Kenny et al., 2019; Marsh & Leamon, 2019). Complex risk factors for child removal (such as homelessness, substance use, sex work, inter-partner violence, colonization, racialised policies and poverty) act dynamically with grief, loss, and trauma to influence women’s risk of overdose. In the context of the overdose crisis in Canada resulting primarily from accidental fentanyl poisoning, this paper focuses on the under-examined issue of unintentional, non-fatal drug overdoses among marginalised women (Collins et al., 2019).

Specifically, the objectives of this study were to describe the prevalence of unintentional overdose in a cohort of marginalised women comprised of sex workers and women living with HIV in Canada, and examine the association between child removal and recent non-fatal overdose over an eight-year period. As a second aim, we sought to explore the effects of child removal on recent unintentional, non-fatal overdose for Indigenous women, given the colonial history of intergenerational family separation.

METHODS

Study design

Data for this study were drawn from two ongoing community-based open-prospective cohorts of marginalised women in Metro Vancouver called AESHA (An Evaluation of Sex Workers’ Health Access) and SHAWNA (Sexual Health and HIV/AIDS: Women’s Longitudinal Needs Assessment). Metro Vancouver includes the City of Vancouver and the twenty surrounding municipalities, including Surrey, Richmond, Burnaby, Coquitlam, Delta, and Langley Township. AESHA was developed through community collaboration with sex work agencies and operates under continued monitoring by a Community Advisory Board; its protocols have been described in detail by Shannon and colleagues (2007). SHAWNA operates as a partnership of women’s HIV and community services providers and is guided

by a Community Advisory Board and a Positive Women's Advisory Board; its protocols have been detailed further by Duff et al. (2018).

Eligibility for both cohorts was cisgender or transgender women, aged 14 years or older and able to provide informed consent. For the AESHA cohort, additional eligibility was active engagement in sex work at baseline, and for the SHAWNA cohort it was living with HIV. AESHA initiated recruitment in 2010 while SHAWNA began in 2014, and both cohorts include staff with lived experience across interviewers, coordinators and co-authors to reflect communities (sex workers, people living HIV, drug users, etc.). AESHA recruitment has been described previously but, briefly, includes community mapping and time-location sampling, which is considered to be a useful method of recruitment for mobile/hidden populations (Stueve, O'Donnell, Duran, San Doval & Blome, 2001). Street, indoor and online sex work venues were identified through participatory mapping strategies conducted with current/former sex workers to identify sex work locations (Shannon et al., 2007). These work locations are updated regularly, at least two to four times each year and sometimes more. SHAWNA recruitment includes self-referrals, referrals by providers, AIDS Service Organisations and Peer Research Associate team (Duff et al., 2018).

Data for this study were collected between January 2010 and February 2018. Since the primary exposure was child custody loss, we restricted the analysis to women who had reported ever having at least one live birth and provided responses to questions about child custody loss.

At enrolment and bi-annually, participants in both cohorts completed an interviewer-administered questionnaire by a trained community interviewer. The questionnaire elicited responses related to parenting and mothering, including number of children and exposure to child removal by the state or by family members, child death, or children in the care of a partner or relative. Other variables include socio-demographics (e.g. sexual identity, ethnicity, housing), sex work variables (e.g. work environment, solicitation, social cohesion, access to services, violence/safety, incarceration, types of services, condom use), intimate partners (e.g. sexual history, cohabitation, financial support), trauma and violence (e.g. lifetime and childhood trauma, exposure to intimate partner and workplace violence), drug use patterns (injection and non-injection, and overdose), overall physical, mental and emotional health, sexual and reproductive health, and HIV testing and treatment experiences. Participants were then offered voluntary HIV/STI serology testing by a project nurse and clinical monitoring of CD4 and VL if HIV positive. Participants were given the option to visit a study office or complete the questionnaire and clinical component at a safe location identified by them, including work, clinic or home locations. All participants received an honorarium of $40–50 CAD at each bi-annual visit for their time, expertise and travel.

Theoretical approach

This research has been informed by postcolonial feminism and critical social theory. Postcolonial perspectives draw attention to pervasive social conditions related to colonization and racism (Racine, 2009), an important perspective to consider in this research on child custody loss where approximately 42% of the participants in the cohort are Indigenous. Postcolonial feminism specifically, through its centring of women's voices and

experiences by recognizing their intersecting oppressions in patriarchal and colonised societies, offers a route to shift this research on maternal overdose from a practice of "speaking on behalf of" women who use drugs to a more emancipatory reflexive practice that emphasizes their human agency and the injustices of the child welfare system (Kirkham & Anderson, 2010). Complementing this, critical social theory's interrogation of conventional social structures (e.g. health inequities in Indigenous communities and/or commonly held beliefs and values about motherhood) promotes a reflective critique of researchers' practices and the systems and institutions in which they operate (Speziale, Streubert & Carpenter, 2011).

Critical social, feminist and postcolonial theories have also contributed to the development of the theory of marginalization. Critical theoretical perspectives extend center-periphery critiques from development theory (Koo, 1981) to examine inequitable economic and power relationships within industrialized societies based on class. While critical social theory primarily locates oppression in economic exploitation and inequitable and unjust economic relations, feminist theory furthers this analysis to include the functions of gendered social relations, sexual and reproductive roles and gendered social expectations in generating or exacerbating unequal social relations (Cho, Crenshaw & McCall, 2013). Feminists have also used the analogy of "margins" in relation to the "center" to challenge white chauvinism, Eurocentrism and patriarchal sexism, which underpin privilege in society.

The conceptual model for this research was adapted from the Structural HIV Determinants Framework for marginalised women developed by Dr. Kate Shannon and team, as a heuristic of the mechanisms by which structural interventions can intervene or mitigate HIV/STI risks (Shannon, Goldenberg, Deering & Strathdee, 2014). This framework draws on many of the theoretical traditions mentioned above (feminist, post-colonial and marginalization) and on earlier work in sex work, drug use, and HIV by Blanchard and Aral (2010) and Rhodes and colleagues (Rhodes, Singer, Bourgois, Friedman & Strathdee, 2005). The conceptual model for this study further adapts the Structural HIV Determinants Framework and the WHO Ecological Framework to depict hypothesised pathways between macro-structural child welfare policy and maternal health, including mediating pathways of various determinants (risks and protective factors) across structural, community, relationship and individual domains.

Ethics statement

The studies hold ethical approval through Providence Health Care/University of British Columbia Research Ethics Board and the University of Oxford (Ref#SPIC1A16029). The parent studies of AESHA and SHAWNA both have community advisory boards of over 15 agencies serving marginalised women and include partnership with Indigenous agencies and people with lived experience of HIV, sex work, and substance use.

Study variables

Primary outcome: unintentional, non-fatal drug overdose—Our outcome of interest was a time-updated self-reported measure capturing unintentional, non-fatal overdoses in the last six months at each bi-annual study visit. This was defined as

responding “yes” to the question “In the last six months, have you ever overdosed by accident (i.e. where you’ve had a negative reaction by using too much drugs)?” In the Canadian policy context, national statistics capture whether an overdose is intentional (purposely self-inflicted, as in cases of suicide) or unintentional (accidental). Unintentional drug poisoning deaths include cases where a drug is taken accidentally, too much of a drug is taken accidentally, the wrong drug is given or taken in error, or an accident occurred in the use of a drug(s) in medical and surgical procedures. Given the public health emergency related to unintentional overdoses in Canada, this study did not focus on intentional, suicidal overdose.

Primary independent variable: child removal—For the purposes of this study, child removal to Child Protective Services was defined as the temporary or permanent loss of rights to parent one’s child(ren) (Duff et al., 2014). Our primary independent variable of interest was a time-updated measure of lifetime child removal by the state, defined as responding “yes” to the question “Have you ever had any children apprehended by Child Welfare Services?”.

Subsequently, a four-way categorical variable was derived to examine the joint association of child removal and Indigenous ancestry given the overrepresentation of Indigenous families in the child welfare system. Participants self-identified as Indigenous by answering “yes” to the question “Do you identify yourself as an Aboriginal person, that is, First Nations, Métis, or Inuit?”. The term Indigenous is used throughout this paper to refer collectively to the First Nations, Inuit and Métis peoples of Canada while also acknowledging and respecting the great diversity in culture, traditions and languages between and among these groups. The joint variable was defined as follows: i. non-Indigenous women who did not experience child removal, ii. non-Indigenous women who experienced child removal, iii. Indigenous women who did not experience child removal, iv. Indigenous women who experienced child removal.

Other variables of interest and potential confounders—Other variables of interest and potential confounders were selected a priori based on a literature review and adapted from the Structural Determinants Framework for marginalised women, as described above (Shannon et al., 2014). Time-fixed individual variables included Indigenous ethnicity (i.e., First Nations, Metis, Inuit) and education (high school graduate vs. less than high school), while historical removal from participants’ own parents was considered a time-fixed structural variable. All remaining variables were time updated at each bi-annual study visit. Time-updated individual variables included age (in years), main source of income in the last six months (sex work, no formal employment, or formal employment), lifetime illicit drug use, and lifetime diagnosis with a mental health condition. Time-updated social and structural variables referring to events in the last six months included food insecurity (defined as responding “often true” or “sometimes true” to at least one item on the Radimer-Cornell food insecurity scale vs. “never true” to all items), exchanging sex for money/goods/services, physical or sexual violence from intimate partners (measured using the WHO Intimate Partner Violence Scale), and homelessness(Radimer, Olson and Campbell, 1990).

Time updated lifetime social and structural variables included ever experiencing homelessness or being in jail overnight or longer.

Statistical analyses

Baseline descriptive statistics were calculated, stratified by unintentional non-fatal overdose, and compared using Pearson's chi-squared test (or Fisher's exact test for small cell counts) for categorical variables and the Wilcoxon rank-sum test for continuous variables.

Since analyses of factors potentially associated with overdose during follow-up included time-updated serial measures for each participant, bivariate and multivariable generalised estimating equations (GEE) with a logit link function for binary outcomes were used to determine which factors were independently associated with overdose in the last 6 months. Therefore, data from every follow-up visit was considered in this analysis. For example, an individual participant may have reported overdose during follow-up and this approach serves to examine variables that correlated with times when overdose exposure is not reported. To adjust the standard error and account for correlations arising from repeated measurements on the same participant over the follow-up period, an exchangeable correlation matrix was applied.

We also explored the joint effects of Indigeneity and child removal using a four-way categorical variable. The four-way categorical variable examined, in comparison to being non-Indigenous and never having a child apprehended, the joint effects of i) being Indigenous and having experienced child removal; ii) being Indigenous with no children apprehended; iii) being non-Indigenous and having experienced child removal. For both sets of analyses, all a priori confounders were included in the full multivariable models, and the process described by Maldonado and Greenland (1993) was used to determine the most parsimonious models. Hypothesised confounders were removed in a stepwise manner, and the variable corresponding to the smallest relative change in the association of interest was removed from the model. This iterative process continued until the minimum relative change in the association of interest exceeded 5%. Two-sided p values and unadjusted and adjusted odds ratios (OR and AOR) with 95% confidence intervals (95% CI) are reported. All statistical analyses were performed using SAS software version 9.4 (SAS Institute, Cary, NC, USA).

RESULTS

Descriptive results

From the combined total cohort of over 1000 marginalised women who completed a baseline visit between January 2010 and February 2018, a total of 696 women who reported ever having a live birth answered questions surrounding child custody loss and were included in this study. Baseline individual and socio-structural characteristics of participants who reported an unintentional, non-fatal overdose compared to those who did not are displayed in Table 1. At baseline, the median age was 40 (interquartile range (IQR) 32–45) and 41.5% (n = 289) of the women identified as Indigenous. A lifetime history of unintentional, non-fatal overdose was reported by 35.1% (n = 244). Throughout the study period, 19.4% (n = 135)

reported an unintentional, non-fatal overdose in the past 6 months in at least one study visit. Of the 696 women, 39.7% had experienced child removal at baseline, and of those who reported an overdose in the last 6 months at baseline, 59.4% had experienced child removal. A large percentage of the marginalised women (76.2%; n = 530) reported ever using illicit drugs and 51.3% (n = 357) reported ever being diagnosed with a mental health condition.

Bivariate and multivariable gee analyses of the effect of child removal on unintentional, non-fatal overdose—Bivariate and multivariable odds ratios for the independent association between child removal and unintentional non-fatal overdose are displayed in Table 2. In bivariate GEE analyses, child removal was associated with over 80% higher odds of unintentional, non-fatal overdose (OR 1.82; 95% CI 1.24–2.67; p = 0.002). In the final multivariable GEE model, the odds of experiencing an overdose were 1.55 (95% CI 1.01–2.39; p = 0.047) times higher for women who reported having a child apprehended than for women who did not, after adjusting for Indigeneity and education.

Bivariate and multivariable GEE analyses of the joint effects of indigeneity and child removal on unintentional non-fatal overdose—To examine the joint effects of Indigeneity and child removal on unintentional non-fatal overdose, we examined a four-way categorical variable with the reference being non-Indigenous women with no history of child apprehension. All categories experienced significantly higher odds of overdose in bivariate analysis, and the odds were highest for Indigenous women who had children apprehended (OR 2.46; 95% CI 1.48–4.10; p < 0.001). The multivariable analysis showed, after adjusting for education, recent food insecurity, and recent sex work, that Indigenous women who had experienced child removal had over twice the odds of reporting an unintended overdose than non-Indigenous women who had not lost custody of their children (AOR 2.09; 95% CI 1.15–3.79; p = 0.015).

DISCUSSION

We found that child removal was associated with an increased odds of unintentional, non-fatal overdose, and these effects were particularly pronounced in Indigenous women who had experienced child removal, compared to non-Indigenous women with no child removal. These findings are consistent with an emerging body of literature establishing links between child custody loss, grief and maternal morbidity (Barrow & Laborde, 2008; Farahzad, 2016; Kyzer et al., 2014; Thornton et al., 2013; Wall-Wieler et al., 2018). These results also contribute to a growing body of research that establishes a potential pathway between child removal and harmful substance use (Duff et al., 2014; Kenny et al., 2019; Marsh & Leamon, 2019). One systematic review of the literature reported that the removal of a child from custody has similar psychological effects to losing a child, with an often prolonged grief period and additional feelings of inadequacy and guilt (Marsh & Leamon, 2019). Marsh and Leamon (2019) argue that inadequate consideration has been given to women who have had a child removed from their custody, which may intensify their grief symptoms. The results of the current study contribute to the hypothesis that the psychological effects of removal of a child at birth may cause a mother to relapse from an underlying substance use disorder, resulting in her substance use increasing in severity, or for her to attempt suicide or experience an overdose. The pathway is complex and includes multiple mediating factors

that both increase the risk of overdose but also increase the risk of custody loss, including economic and social policies and discourses that shape experiences of public policy for poor and racialized women. In order to develop effective interventions for women at risk of overdose and child custody loss, it is crucial that future research aims to identify and address these pathways. The postcolonial feminist and critical social theoretical framing of this research underscores the role of prohibitionist drug policies, together with the child welfare system, in exacerbating the risks of child custody loss and subsequent potential for maternal overdose.

Though individuals consume drugs for myriad reasons, for many women substance use is a method of coping with trauma, such as childhood abuse, partner violence, and the intergenerational effects of colonization on Indigenous women (Kenny et al., 2019; Walters & Simoni, 2002). We found a high prevalence of underlying substance use and overdose in the cohort. These findings further build on the work of Harp who found that both informal and formal child removal resulted in an increase in substance use by a factor of 4.14 among a longitudinal cohort of 393 African American women in the United States (Harp & Oser, 2018). Jongbloed and colleagues, in their study of mortality amongst Indigenous people who use drugs in two cities in B.C., Canada (Vancouver and Prince George), found that Indigenous women experience eight times more overdose events and five times more deaths from overdose than non-Indigenous women (Jongbloed et al., 2017). This study also identified associations between engagement with the child welfare system and risk factors for death, including overdose among those who use drugs (aOR 2.7, 95% CI 1.6–4.5) (Jongbloed et al., 2017). The link between intergenerational trauma and substance use is widely recognised as a social phenomenon linked to the history of forced residential school in North America, and, later, forced adoption during the Sixties Scoop, which have led to an overrepresentation of child removals among Indigenous communities (Blackstock et al., 2015; Kenny et al., 2019; Wildeman & Emanuel, 2014). We found that 171/289 (59.2%) of Indigenous women in our cohort had experienced child removal at baseline compared to 105/406 (25.9%) non-Indigenous women. The forced removal of entire generations of children along with the ongoing removal of land and the subsequent loss of culture and language has been acknowledged as a form of genocide and collective trauma for Indigenous peoples (Alberta Provincial Government, 2018; Brave Heart & DeBruyn, 1998; Government of Canada, 2008, 2010). This collective trauma has been linked to higher rates of substance use and mental illness as well as social factors that exacerbate overdose risk among Indigenous women, including poverty, fetal alcohol effects, homelessness, food insecurity, and prison (Browne & Varcoe, 2006; Jongbloed et al., 2017; Kenny et al., 2019).

The link between overdose and exposure to criminalization is an ongoing public health concern (Goldenberg et al., 2020). In this current study, we also found that 62% of women reported experience with jail or prison, and 12% reported this in the past six months. Additionally, of the women in our study who had experienced an episode of non-fatal overdose at baseline, 81% had been in jail or prison, which was significantly higher than for those who had not experienced overdose. Experiences of jail or prison can physiologically increase the risk of opioid overdose, as patients experience a decreased tolerance to drugs after a period of abstinence and, if they use opioids upon release, they are more at risk of overdose (British Columbia Centre on Substance Use, 2018; Comer et al., 2015; Committee

on Obstetric Practice, 2017). In a systematic review of the literature, DeBeck and colleagues found that criminalization and stigmatization of drug use can act as a barrier to access to health services by creating a hostile environment, limiting access to the overdose prevention reversal drug, naloxone, testing and treatment of HIV/HCV, and substance use treatment (DeBeck et al., 2017).

For this reason, public health experts are calling for access to a safe, regulated supply of opioids for drug users to combat the overdose crisis in Canada (PHO Report, 2019). Not all individuals who use illicit substances, however, experience criminalization equally; in order to fully appreciate criminalization of drug use, greater consideration must be given to the convergence of social, structural, and economic factors that influence mothers interactions with the criminal justice system (Boyd, Fast & Small, 2016; Collins et al., 2019).

Policy implications

In the context of the declared public health overdose emergency in Canada, research examining the associations between overdose and policy-amenable risk factors through a postcolonial feminist and critical social theoretical lens is vital in preventing mortality among marginalised women. Such theories are key to interrogating the current social and structural environment in which marginalised women live, work, and raise children. In this cohort of marginalised women in Vancouver, Canada, we found a high burden of accidental overdose among women who had experienced child removal. Although not generalisable to all women, the findings suggest there may be an unmet need for linkages to harm reduction, substance use treatment and safe drug supply for women who have experienced child removal. Services known to prevent accidental overdose include naloxone, supervised injection facilities, opioid agonist therapy (including methadone and buprenorphine), and psychosocial support (Degenhardt et al., 2019). However, a lack of attention to the gendered dimensions of health care can reinforce gender inequities and its crucial services become tailored to addressing the overlapping social and structural vulnerabilities that increase the risk of overdose among marginalised women (Boyd et al., 2018; Collins et al., 2019). Maternal health services should include opioid overdose prevention and management, the prevention, testing, and treatment for harmful substance use, and mental health supports as part of their package of services to new and expecting mothers experiencing marginalization in Canada. Child welfare offices and social workers working with marginalised mothers should offer peer-administered naloxone, and immediate referrals to harm reduction and treatment services that include safe supplies of opioids that reduce the risk of fentanyl poisoning (Open Society Foundations, 2018). Treatment pathways and triage services for interventions such as prescription heroin and opioid agonist therapy should consider prioritizing pregnant women and women who have experienced recent child removal. Ultimately, federal policy change toward the decriminalization of drug use and regulation of substances may be integral to preventing loss of custody due to prohibitionist drug policy and unintentional overdose amongst mothers coping with child custody loss.

An emerging body of literature supports the integration of trauma and violence-informed, culturally safe approaches to improve retention in health and social care for marginalised women (Browne & Varcoe, 2006; Poole & Greaves, 2009). To improve retention in

maternity, postnatal care, and addiction treatment, training on trauma-informed practice should be provided for social workers and health care providers who regularly come into contact with marginalised women (Marsh & Leamon, 2019; Poole & Greaves, 2009). Such approaches have been successfully applied by Sheway, a pregnancy outreach program operating in Vancouver's Downtown Eastside, and FIR Square, which provides maternity and addiction care for women struggling with substance use at B.C. Women's Hospital in Vancouver. Both programmes are focused on positive early parenting experiences and increasing mothers' ability to safely retain custody of their children postpartum and through the child's early life, including the provision of a safe and regulated supply of opioid agonist treatment (Seaman, 2004; Vancouver Coastal Health, 2020).

In addition, due to the unique and devastating structural historical and contemporary context shaping Indigenous women's interaction with services, Blackstock argues that reconciliation of child welfare systems for Indigenous women must begin with recognition of the damage caused by previous policy and Indigenous leadership to determine a path forward informed by human rights perspectives (Blackstock, Cross, George, Brown & Formsma, 2006). Further, child welfare services must distinguish between the need for 'protective care' versus 'supportive care' or 'least disruptive measures', and, in the case of the latter, help women address the structural risks they and their children face through culturally appropriate social services and family liaisons (Blackstock, 2011; Blackstock et al., 2006; Martin & Walia, 2019).

With the passing of Bill C-92, An Act respecting First Nations, Inuit and Métis children, youth and families, the jurisdiction of Indigenous peoples for child and family services was affirmed by the Government of Canada (2019). This legislation recognises that a child's best interests are promoted when the child is able to stay with their parent, family or community (Government of Canada, 2019). In spite of the positive elements of the Bill, however, the legislation has so far been limited by a lack of clarity around funding and provisions to ensure its enforceability and meaningful improvements for Indigenous children and families (Metallic, Friedland, Craft, Hewitt & Morales, 2019).

Limitations

There are a number of strengths and limitations to consider in the interpretation of this study. Strengths of this analysis include the prospective design and GEE analyses, which increased the number of observations, allowing average estimates of the correlates of overdose over an eight-year period to be determined. However, variables in this study were self-reported and include sensitive topics (e.g. removal from childhood family home, drug use, partner violence), which may have resulted in underreporting or respondent-driven reporting biases by participants. To reduce social desirability bias, the interviewer-administered questionnaires were conducted in safe and comfortable spaces by experienced interviewers (including current/former sex workers and women living with HIV) with strong community rapport, and there is no reason to believe there would be differences in reporting between those who had experienced overdose and those who had not.

Although our findings may not be fully generalisable to all marginalised women in Canada, our study population included wide-ranging representations of sex work environments,

women affected and infected by HIV, women living in poverty, and women who use drugs. The study methodology, mapping of working areas and time-location sampling likely helped to ensure a representative sample and to minimize selection bias; however, higher-income earning and independent marginalised women (e.g. escorts, online, women who access private HIV care) are likely underrepresented.

Another important limitation relates to causality. Although we found a significant association between child removal and overdose, we cannot conclude that this is a causal effect. The majority of child removals in this study occurred prior to baseline, but this exposure was time-updated to capture participants who experienced child removal in the last six months at any bi-annual study visit. Although only 32 participants experienced child removal during follow-up, 27 of whom had a child removed prior to their baseline survey, temporality between the exposure and outcome cannot be determined for these participants.

Furthermore, in order to establish the relationship between child removal and overdose in the absence of confounders, we did not control for potential mediators based on our literature review that may block the true association between child removal and overdose, such as substance use disorder or mental illness, and structural vulnerabilities on the causal pathway to overdose, including homelessness and intergenerational trauma (Skellt, 2012).

Finally, this study took into account known, measured confounders, but the exclusion of unmeasured or unknown confounders may have lead to biased estimates of the association between child removal and unintentional, non-fatal overdose. Further research is needed to establish causality and disentangle these complex associations.

CONCLUSION

This analysis suggests that, after controlling for known confounders, women who have a child removed experience higher odds of non-fatal overdose, and these odds are highest among Indigenous women. This highlights the immediate importance of increased cultural safety education for health care providers to understand the constellation of colonial policies which continue to impact Indigenous women today. Other factors associated with overdose in the bivariate analyses included level of maternal education, homelessness, and recent experiences of intimate partner violence. The high prevalence of both lifetime and recent overdose in this cohort of marginalised mothers suggests the need for further gender responsive strategies to prevent overdose among women, including expansion of opioid agonist therapy and treatment services accessible to pregnant and parenting women. Where possible, families should be supported to stay together. When children are removed from the care of their mothers, enhanced support plans may be required to prevent substance use relapse or increased severity of substance use disorder, and to prevent overdose including the provision of peer-administered naloxone, overdose awareness training, and expedited referrals to a safe, regulated drug supply and support. Training of health care providers should be offered to enable the identification and referral of women experiencing grief post child removal and at risk of overdose. Finally, large scale systemic changes and decolonizing approaches are required to address the continued structural violence that Indigenous and

racialized women face in contemporary Canadian contexts. A focus on self-determining and Indigenous cultural safety is essential to supporting women's rights as mothers.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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TABLE 1.

Baseline characteristics of women who ever had a live birth, stratified by unintentional, non-fatal overdose in the last six months in a longitudinal cohort of marginalised cisgender women in British Columbia, Canada, 2010–2018 ($N = 696$).

Characteristic	Total (%)($N = 696$)	Non-fatal overdose†		*p* value
		Yes (%)($n = 32$)	No (%)($n = 664$)	
Individual and Behavioural Variables				
Age, in years (median, IQR)	40 (32–45)	34 (29.5–41)	40 (32–45)	0.027
Graduated high school	370 (53.2)	16 (50.0)	354 (53.3)	0.714
Main source of income†				
No formal employment	125 (18.0)	6 (18.8)	119 (17.9)	
Sex Work	506 (72.7)	24 (75.0)	482 (72.6)	
Formal employment	45 (6.5)	1 (3.1)	44 (6.6)	0.735
Ever used illicit drugs	530 (76.2)	32 (100.0)	498 (75.0)	0.001
Ever diagnosed with mental health condition	357 (51.3)	25 (78.1)	332 (50.0)	0.002
Indigenous women	289 (41.5)	19 (59.4)	270 (40.7)	0.037
Social and Structural Variables				
Child removal	276 (39.7)	19 (59.4)	257 (38.7)	0.020
Indigenous and child removal				
Non-Indigenous, no child removal	301 (43.3)	5 (15.6)	296 (44.6)	
Non-Indigenous, experienced child removal	105 (15.1)	8 (25.0)	97 (14.6)	
Indigenous, no child removal	118 (17.0)	8 (25.0)	110 (16.6)	
Indigenous, experienced child removal	171 (24.6)	11 (34.4)	160 (24.1)	0.014
Sex work†	578 (83.1)	31 (96.9)	547 (82.4)	0.034
Ever in jail overnight or longer	432 (62.1)	26 (81.3)	406 (61.1)	0.013
Ever homeless	469 (67.4)	28 (87.5)	441 (66.4)	0.013
Recent homelessness†	193 (27.7)	15 (46.9)	178 (26.8)	0.015
Recent food insecurity†	458 (65.8)	27 (84.4)	431 (64.9)	0.032
Sexual or physical intimate partner violence†	87 (12.5)	6 (18.8)	81 (12.2)	0.288
Mother ever removed from parents	236 (33.9)	18 (56.3)	218 (32.8)	0.003

All data refer to *n* (%) of participants, unless otherwise specified.

†In the last six months.

TABLE 2.

Unadjusted and adjusted odds ratios with 95% confidence intervals (CI) and *p* values for the association between child removal and recent unintentional non-fatal overdose among a cohort of marginalised cisgender women in B.C., Canada, 2010–201 (*N* = 696).

	Unadjusted		**Adjusted***	
	Odds Ratio (95% CI)	***p* value**	**Odds Ratio (95% CI)**	***p* value**
Child removal	1.82 (1.24 – 2.67)	0.002	1.55 (1.01 – 2.39)	0.047

*Adjusted for Indigeneity and education.

TABLE 3.

Unadjusted and adjusted odds ratios with 95% confidence intervals (CI) and *p* values for the joint association of child removal and Indigenous ancestry on recent unintentional non-fatal overdose among a cohort of marginalised women in B.C., Canada, 2010–2018 (*N* = 696).

	Unadjusted		**Adjusted***	
	Odds Ratio (95% CI)	***p* value**	**Odds Ratio (95% CI)**	***p* value**
Non-Indigenous, no child removal	Reference		Reference	
Non-Indigenous, experienced child removal	2.17 (1.20–3.94)	0.011	1.75 (0.92–3.33)	0.089
Indigenous, no child removal	1.93 (1.07–3.46)	0.029	1.52 (0.80–2.90)	0.202
Indigenous, experienced child removal	2.46 (1.48–4.10)	<0.001	2.09 (1.15–3.79)	0.015

*Adjusted for education, recent food insecurity, and recent sex work.