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Parenting and childcare responsibilities, harm reduction service engagement, and opioid overdose among women and men who use illicit opioids in New York City

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Abstract

Background: Little is known regarding relationships among parenting, engagement in harm reduction services, and overdose risk among people who use illicit opioids (PWUIO), and whether associations differ by gender.

Methods: Using baseline data from an ongoing study among PWUIO in New York City (n = 575), we measured childcare factors (i.e., residing with children, avoidance of drug treatment for fear of child welfare, difficulty accessing harm reduction due to childcare issues), and harm reduction services and overdose-related outcomes. Among those with children, we estimated prevalence ratios (PR) using modified Poisson regression with a product-interaction term for gender differences.

Results: In the total sample (n = 575), approximately 70% reported having children. Compared to men, women were more likely to reside with children (25% vs 36%; p-value = 0.04), avoid treatment for fear of child welfare (16% vs 26%; p-value = 0.04), and less likely to be trained in naloxone administration (68% vs 61%; p-value = 0.09). Among participants with children (n = 403), residing with children was associated with naloxone training among men (aPR 1.28, 95% CI: 1.01, 1.62). Avoiding treatment for fear of child welfare was associated with carrying naloxone overall (aPR 0.68, 95% CI: 0.46, 0.99), with a stronger association among women (aPR 0.48,

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Contributors

JD Scheidell conducted the analysis and wrote the first draft of the manuscript. L Hoff assisted in analyses, contributed to the manuscript. MR Khan assisted in conceptualizing the study and writing the manuscript. AS Bennett and LC Elliott formulated the parent study and oversaw data collection. All authors revised the manuscript and approved the final manuscript.

Declaration of Competing Interest

None to disclose.

95% CI: 0.26, 0.92). Difficulty accessing services due to childcare was associated with lifetime overdose (aPR 1.53, 95% CI: 1.05, 2.23).

Conclusion: Childcare responsibilities may be a barrier for accessing substance use services and treatment for men and women. Further qualitative and mixed-methods research is needed to understand how to make treatment and services accessible for parents.

Keywords

Opioids; Parenting; Women; Harm reduction; Overdose

1. Introduction

Drug overdose deaths in the United States (US) have dramatically increased since 1999, with two out of every three deaths involving opioids (Centers for Disease Control and Prevention, 2020). Specifically, in 2019, approximately 50,000 people died from an opioid-related overdose (Centers for Disease Control and Prevention, 2021). The overall rate of overdose was consistently higher among men compared to women between 1999 and 2015 (Hedegaard et al., 2020); however among women, overdose rates have spiked 471% during that period, which is twice the rate of increase seen among men (Office of Women's Health, 2017).

In response to the dramatic rise in overdose mortality, there has been an increase in implementation of opioid overdose education and naloxone distribution (OEND) programs to train laypersons to respond to overdose events and administer naloxone (Wheeler et al., 2015). These are often integrated into syringe service programs (SSPs), which have been successful in preventing infectious diseases such as HIV and are now leading efforts in preventing overdose (Lambdin et al., 2020). Despite naloxone becoming more accessible, rates of overdose have remained high (U.S. Food and Drug Administration, 2015), highlighting the importance of understanding the factors surrounding overdose risk and access to naloxone and other harm reduction services. Drug treatment is similarly under-utilized, with only approximately 20% of people with opioid use disorder (OUD) receiving treatment (Wu et al., 2016). Drug treatment, including in inpatient and outpatient settings, complements community-based OEND programs (Jones et al., 2016), and can help to facilitate access to take-home naloxone and to prevent opioid overdoses (Katzman et al., 2020).

One factor that is under examined in association with OEND, OUD treatment, and overdose risk among people who use illicit opioids is the role of parenting and childcare responsibilities. Stigma surrounding substance use and criminalization of substance use during pregnancy and parenting (Stone, 2015) may be a barrier for engaging in harm reduction services (Varma Falk et al., 2020), potentially exacerbating risk of overdose. Loss of child custody due to substance use negatively affects maternal health, and rates of treatment are low for parents with OUD (Clemans-Cope et al., 2019). Hence, parenting may be a barrier to accessing treatment and engaging in harm reduction, thus potentially increasing overdose risk. There is evidence that, among those with OUD, those living with children are more likely to report barriers to receiving treatment such as not being able to

find the right type of program and encountering more stigma (Feder et al., 2018). However, effects of parenting on use of harm reduction interventions (e.g., being trained to administer naloxone, accessing SSPs) as well as parenting's relationship to opioid overdose are not well understood. We also do not know if parents who are concerned about child welfare involvement due to their substance use or those who have childcare-related barriers may also be less likely to engage with OEND programs and other harm reduction interventions, and therefore have potentially greater risk of overdose.

There may be differences between men and women in their childcare responsibilities and perceptions of childcare as barrier to treatment and services, as well as gender differences in the impact of childcare and parenting on harm reduction engagement and overdose risk. Unfortunately, most research focused on parenting and substance use has focused on the mothers' substance use (Collins et al., 2019), although many men who use opioids are fathers (McMahon and Rounsaville, 2002).

We sought to address gaps in research on the association between parenting factors and overdose-related outcomes. We examined whether parenting and childcare factors, including their role as barriers to treatment engagement and service utilization, were each independently associated with the outcomes of OEND, SSP utilization, and self-reported overdose in a cohort of people who use illicit opioids in New York City, and examined whether associations differed for men and women.

2. Materials and methods

2.1. Study sample and procedures

Potential participants were recruited using respondent-driven sampling (Heckathorn, 1997), in which coupons were provided and allowed participants to refer up to three members of their opioid-using network to participate in the study. Eligible participants were at least 18 years of age and were currently (i.e., within the 3 days prior to enrollment) using opioids that were either illicit andor unprescribed (i.e., heroin, fentanyl, and prescription opioids). We verified self-reported opioid use by using a rapid urinalysis tool. Baseline surveys were administered by trained and experienced interviewers. Upon completion of the baseline survey, participants were trained in naloxone administration and overdose prevention, watched a Department of Health training video, and received naloxone. At the completion of baseline study visit, participants were provided $60 remuneration and three numbered coupons that they were asked to distribute to other people who use illicit opioids within their networks to receive $15. We began recruitment in April 2019 and stopped in March 2020 due to the COVID-19 pandemic; ten initial seeds resulted in enrollment of 575 participants. All procedures were approved by the Institutional Review Board.

2.2. Measures

2.2.1. Childcare and parenting factors—On the baseline survey, participants reported the number of children, which we dichotomized as any versus none due to the skewed distribution and the median number of children was one. Among those with children, participants reported whether their children had stayed with them at least one night

in the past month, if they had ever avoided seeking treatment for drug use in fear of child welfare involvement, and if they ever had difficulty accessing SSPs or other harm reduction services due to childcare responsibilities; all were dichotomous variables.

2.2.2. Harm reduction and overdose measures—Harm reduction outcome measures included reporting having ever been trained in OEND, currently having naloxone, and having visited an SSP in the past 3 months. Lifetime opioid overdose was defined as self-report of having ever experienced an overdose involving opioids. Participants also reported if they had experienced an opioid overdose events in the past 30 days, including thinking they had overdosed, people were concerned about how druggedsedated they were, difficulty breathing, fell down while using, lost consciousness, required medical attention, andor was administered naloxone; those reporting at least one of these were considered to have had an overdose experience in the past month (Pouget et al., 2017).

2.2.3. Sociodemographic and background characteristics and substance use history—Sociodemographic and background characteristics included self-reported age; gender, categorized as men and women; race/ethnicity, categorized as non-Hispanic white, non-Hispanic Black, Hispanic/Latinx, and other; New York City borough of residence; currently homeless; current employment status, defined as working full- or part-time in the formal/informal economy versus not working or unable to work; educational attainment, categorized as less than high school, high school graduate/GED, and some college or beyond; and marital status, categorized as married or living as married versus divorced, widowed, or never married.

Participants reported if they had ever been incarcerated. Dichotomous indicators of adverse childhood experiences included abuse, neglect, and household dysfunction, which were summed and dichotomized at ≥3 experiences. Support from members of the participant's non-drug using network (i.e., family, neighbors) in the past 3 months included receiving tangible and emotional support.

Substance use history included age at first opioid use, categorized in quartiles; OUD severity based on DSM-5 criteria, categorized as mild/moderate (scores <6) versus severe (≥6); having ever been in treatment for opioid use. Drug use stigma was measured using a 6-item adapted version of the Stigma Consciousness Scale (Ross et al., 2007), on which participants rated their agreement with items such as "I feel guilty about using drugs "; we excluded items that were not applicable to the current sample (i.e., sex trade partners' knowledge of use), summed the items (Cronbach's alpha = 0.76), and since there is no validated cut-point for the scale we dichotomized at the median score of ≥13 to indicate low versus high stigma.

2.3. Analyses

All analyses were conducted in Stata 15.1. In bivariate analyses among the total cohort (N = 575), we estimated the distribution of parenting and childcare factors, harm reduction, and overdose by gender using Chi-squared tests. Among those with children (n = 403), we examined whether sociodemographic and background characteristics and substance use history were associated with avoiding drug treatment for fear of child welfare involvement, using modified Poisson regression with robust variance estimation to ensure

model convergence (Avery et al., 2019). We included a gender product-interaction term to test for differences in the associations between men and women. Finally, we examined the associations between childcare and parenting factors and the outcomes of harm reduction and overdose; we presented the prevalence of the outcomes within strata of the childcare and parenting factors to provide context for the estimated prevalence ratios. Adjusted models included limited set of demographic characteristics (i.e., age, race/ethnicity, New York City borough of residence, current homelessness) to optimize model precision given the modest sample size, and reporting injecting opioids in the past 30 days due to differences in SSP use and harm reduction services for people who inject versus those who do not.

3. Results

3.1. Prevalence of parenting and childcare responsibilities, harm reduction service use, and overdose risk

Among our sample of 575 New Yorkers who use illicit opioids, the average age was 48 years and approximately one-third were women (data not shown in tables). Approximately 38% of participants were Black, 40% were Hispanic/Latinx, 18% were white, and 3% were members of other racial/ethnic groups (e.g., Asian, American Indian). Around 25% of participants reported less than a high school education, 40% were high school graduates, and 33% had completed at least some college education. The majority (78%) were not currently married.

In the total sample, 403 (70.6%) had children, and this did not differ significantly between men and women (Fig. 1). Significantly more women reported that their child stayed with them in the past month (36.4%) than men (24.7%). Compared to 15.7% of men, 26.0% of women reported that they avoided drug treatment for fear of child welfare involvement. There was no difference in reporting difficulty accessing SSPs or other harm reduction services due to childcare responsibilities. More men had been trained to administer naloxone (68.4%) than women (61.0%), but there was no significant difference in not having naloxone between the two groups. Men and women appeared to attend SSPs in the last three months equally, approximately 40% in each group. Similarly, there were no differences in ever experiencing an opioid overdose (36.9% vs. 39.3%) or experiencing an overdose in the past 30 days (32.4% vs. 30.2%).

3.2. Correlates of avoiding drug treatment for fear of child welfare involvement

Among those with children, Black and Hispanic/Latinx participants reported a lower prevalence of avoiding drug treatment for fear of child welfare involvement compared to white participants (Black Prevalence Ratio (PR) = 0.59; 95% CI: 0.31, 1.14; HispanicLatinx PR = 0.42; 95% CI: 0.20, 0.87; Table 1). Compared to those with mild/moderate OUD, those with severe OUD had over twice the prevalence of avoiding treatment for fear of child welfare involvement (PR = 2.19; 95% CI: 0.91, 5.24). Those with higher levels of drug use stigma had 2.5 times the prevalence of avoiding treatment (PR = 2.50; 95% CI: 1.42, 4.42) compared to those with lower reported stigma levels.

3.3. Associations between parenting and childcare factors and harm reduction services and overdose risk

In adjusted models, we observed that among women, those who reported having their child stay with them in their past month appeared to have lower prevalence of being trained to administer naloxone compared to those who did not have children stay with them (Table 2; adjusted PR [aPR] = 0.76, 95% CI: 0.52, 1.10). The opposite was noted among men, who had a higher prevalence of naloxone training (aPR = 1.28, 95% CI: 1.01, 1.62). Participants who reported difficulty accessing harm reduction services due to childcare responsibilities had higher prevalence of having been trained to administer naloxone (aPR = 1.27, 95% CI: 1.03, 1.56).

Avoiding drug treatment for fear of child welfare was associated with approximately 30% lower prevalence of having naloxone in the total sample (aPR = 0.68, 95% CI: 0.46, 0.99).

In the total sample, there was no association between residing with children and visiting an SSP, although among women there did seem to be a slightly increased prevalence (aPR = 1.26, 95% CI: 0.80, 1.98). Avoiding drug treatment was associated with somewhat higher prevalence of visiting an SSP among women (aPR = 1.26, 95% CI: 0.79, 2.02).

Difficulty accessing SSPs or other harm reduction services due to childcare responsibilities was associated with approximately 50% higher prevalence of lifetime overdose in the total sample (aPR = 1.53, 95% CI: 1.05, 2.23).

Sample size was limited for opioid overdose in the past month among those with children, but none of the parenting or childcare factors appeared associated.

4. Discussion

In this cohort of people who use illicit opioids in New York City, the majority were parents. Women appeared more likely than men to have children living with them and to avoid drug treatment due to fear of child welfare. Avoiding drug treatment for fear of child welfare was associated with decreased prevalence of possessing naloxone, and being unable to access harm reduction services due to childcare was associated with lifetime overdose among both men and women. Our findings highlight the need for opioid use treatment and harm reduction providers to consider the specific needs of parents and to identify ways to reduce barriers to accessing these services while seeking to reduce overdose risk. In light of our findings and studies conducted in nationally-representative samples that have found that a substantial proportion of people using illicit opioids are parents (Feder et al., 2018), addressing their childcare needs could serve to have significant impacts on the opioid overdose health crisis at the population level.

Women in our study had an overall higher prevalence of residing with children compared to men and we found that this appeared to be linked to a lower prevalence of having been trained to administer naloxone among women, while it was associated with a higher prevalence of having been trained among men. This may suggest that caring for children may be an especially salient barrier to naloxone training and having naloxone for mothers.

But the majority of the associations between parenting factors and naloxone did not strongly differ between men and women, which indicates that these childcare and parenting responsibilities are important considerations for both mothers and fathers who use drugs. Overall, drug treatment and services have historically been male-focused and do not often incorporate issues that may be more common for women (Greenfield et al., 2010). Yet, while these spaces should strive to be more inclusive for mothers who use opioids, our findings suggest that addressing childcare and parenting responsibilities would likely be beneficial for men too. However, drug treatment that is described as “family centered ” appears to be primarily aimed to-wards women (Werner et al., 2007). Taken together, our results suggest that considering the unique and overlapping needs of both mothers and fathers could improve engaging in treatment and harm reduction services, and that providing childcare services in harm reduction settings could increase engagement.

We found that those reporting avoiding drug treatment for fear of child welfare had lower prevalence of having naloxone, particularly for women. Child welfare involvement is a legitimate fear for parents who use drugs considering that the vast majority of child welfare cases in the US are substance use-related (Oliveros and Kaufman, 2011). Clearly, ensuring the welfare of children is of paramount importance and child welfare involvement is described by parents as a motivator to engage in substance use treatment (Seay et al., 2017). However, removal of children from parents who use drugs can be detrimental to the health of the parent (Kenny et al., 2019; Wall-Wieler et al., 2018), and the involvement of child welfare is not equally applied. Studies suggest that Black parents, particularly Black mothers, who use drugs are more likely to experience child welfare involvement compared to whites (Chasnoff et al., 1990). We do not know not if the parents in our sample currently have custody of their children, and we did not have adequate sample size to explore intersections of race/ethnicity and gender in the associations. Future research in larger samples is needed to determine factors that drive perceptions of parenting and childcare as barriers and to identify if certain subgroups of mothers and fathers may have heightened vulnerability.

Drug use-related stigma was one of the strongest correlates of avoiding drug treatment due to fear of child welfare for both men and women, and those with high levels of stigma had over twice the prevalence of reporting this fear. Our finding corresponds closely with results obtained in a nationally-representative sample (Stringer and Baker, 2018), which found that among people with OUD who needed treatment but did not receive it, the odds of reporting stigma as a barrier to treatment were 2.5 times higher for those with children compared to those without (Feder et al., 2018). Unfortunately, stigma is commonly experienced by people who use drugs, including in treatment and healthcare settings, and has negative effects on a range of physical and mental health outcomes (Ahern et al., 2007). In contrast, the healthcare services received through harm reduction and community-based organizations that serve people who use drugs are often perceived as non-stigmatizing and accessible (Muncan et al., 2020). Despite recognition that stigma adversely impacts the health of people who use drugs, there are few interventions designed to address it (Bielenberg et al., 2021; Livingston et al., 2012). Successful interventions that reduce drug use-related stigma in healthcare settings have featured people who use drugs providing education to and having direct contact with medical students, residents, and other professionals (Livingston et al.,

2012). However, there are no known interventions that focus on the particularly high levels of stigma experienced by parents who use drugs (Stringer and Baker, 2018). Harm reduction and substance use advocates and people who use opioids are likely key stakeholders who can shape programs and policies to reduce stigma to improve health for parents who use drugs.

Finally, our study is one of the few to report that not only are parenting and childcare responsibilities potentially linked to lower prevalence of harm reduction engagement for some, but also that difficulty accessing SSPs or other harm reduction services due to childcare responsibilities may be a risk factor for opioid overdose. While prior studies have highlighted that parents have difficulty accessing treatment and services (Feder et al., 2018), no known studies have in turn linked these factors to overdose risk. In our sample, those who reported difficultly accessing SSPs or harm reduction services due to childcare responsibilities had an approximately 50% increase in the prevalence of reporting a lifetime overdose, and this was true for mothers and fathers. There are potential pathways that may explain this association. First, being unable to access SSPs or other harm reduction services may directly impede one's ability to avoid overdose. It is also possible that difficulty accessing services due to childcare is stressful, or that our measure may be a proxy for the overall stressors of parenting, and that this stress is what is associated with overdose. Stress is independently linked to opioid use and overdose risk (MacLean et al., 2019), and prior studies have shown that stressful parenting experiences among people who use drugs are risk factors for overdose. For example, in a longitudinal cohort study among mothers who are marginalized, those who had a child removed from their custody had a 55% increase in risk of overdose (Thumath et al., 2020), which may be driven by their stress and grief (Barrow and Laborde, 2008). Future research is needed to disentangle how the stresses of parenting versus parenting as a barrier to needed services may each play a role in overdose risk.

There are important study limitations to note. All of the measures in this study are self-reported and subject to social desirability and recall bias. We lack data on the age of the children or current custody status. The measures of living with children, and fear of child welfare involvement and childcare responsibilities are somewhat vague. Participants were asked only if their child had stayed with them at least once in the past month, which may be a low threshold and there may be differences in harm reduction service engagement and overdose risk for those who are primary caregivers compared to those with minimal visitation. We do not specifically ask what welfare involvement parents feared (e.g., being reported for abuse, loss of custody) or what responsibilities were barriers to accessing harm reduction; future research, including qualitative and mixed methods studies, should elucidate these specific concerns and barriers for parents as well as the potential ways to address them. Our analyses are cross-sectional and some measures are based on lifetime experiences, therefore we do not know the temporality in the associations. Small cell counts limited precision in the analyses and led to wide confidence intervals surrounding the estimates, especially those stratified by gender. Our cohort was created by respondent-driven sampling in New York City, which enabled us to sample a "hard to reach " population, but we did not account for the sampling design in our analyses. While this is acceptable for initial exploratory analyses that are seeking to maximize power (Avery et al., 2019; Miratrix et

al., 2018), it limits the generalizability of our findings beyond this geographically-restricted network of people who use illicit opioids.

5. Conclusions

Residing with children, fear of child welfare, and childcare responsibilities are associated with lower prevalence of training in and carrying of naloxone and higher prevalence of lifetime overdose among mothers and fathers who use illicit opioids in New York City. Drug use-related stigma appears to be a strong correlate of parents' avoidance of drug treatment and reducing the stigmatization experienced by parents who use drugs may be a key first step to increasing their uptake of treatment and services and ultimately reducing opioid overdose risk to improve public health.

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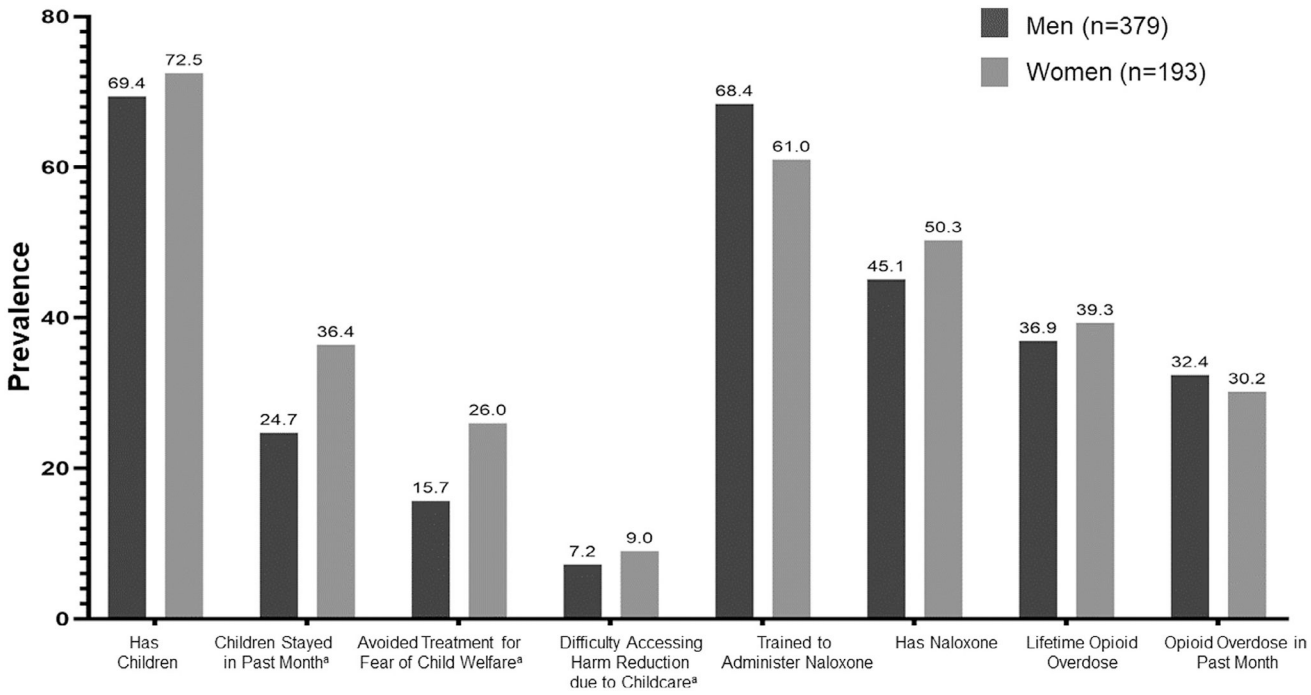

Fig. 1.

Prevalence of parenting and childcare factors, harm reduction engagement, and overdose among men and women who use illicit opioids in New York City ($N = 575$).

Table 1

Factors Associated with Avoiding Drug Treatment for Fear of Child Welfare among those with Children (n = 403).

	Total Sample		Women		Men	
	N (%) Avoided Treatment	PR (95% CI)	N (%) Avoided Treatment	PR (95% CI)	N (%) Avoided Treatment	PR (95% CI)
Age, years		0.99 (0.96, 1.02)		0.98 (0.95, 1.01)		1.02 (0.96, 1.07)
Race/Ethnicity						
White	8 (34.8)	Ref	7 (46.7)	Ref	1 (12.5)	Ref
Black	26 (20.6)	0.59 (0.31, 1.14)	10 (23.3)	0.50 (0.23, 1.07)	16 (19.3)	1.52 (0.23, 10.20)
Hispanic	16 (14.7)	0.42 (0.20, 0.87)	9 (23.1)	0.49 (0.22, 1.09)	7 (10.0)	0.80 (0.11, 5.72)
Other	1 (20.0)	0.58 (0.09, 3.63)	0 (0.0)	N/A	1 (50.0)	4.00 (0.40, 40.01)
Borough of Residence						
Manhattan	21 (22.3)	Ref	11 (30.6)	Ref	10 (17.2)	Ref
Staten Island	2 (33.3)	1.49 (0.45, 4.93)	2 (50.0)	1.63 (0.54, 4.91)	0 (0.0)	N/A
Brooklyn	8 (16.3)	0.73 (0.35, 1.53)	2 (14.3)	0.47 (0.12, 1.85)	6 (17.1)	0.99 (0.40, 2.50)
Bronx	20 (19.6)	0.88 (0.51, 1.51)	10 (25.6)	0.84 (0.40, 1.74)	10 (15.9)	0.92 (0.41, 2.05)
Queens	1 (6.7)	0.30 (0.04, 2.06)	1 (14.3)	0.47 (0.07, 3.08)	0 (0.0)	N/A
Currently Homeless						
No	39 (21.7)	Ref	21 (29.2)	Ref	18 (16.7)	Ref
Yes	13 (15.1)	0.70 (0.39, 1.24)	5 (17.9)	0.61 (0.26, 1.47)	8 (13.8)	0.83 (0.38, 1.79)
Employment Status						
Not employed/unable to work	42 (19.1)	Ref	22 (25.3)	Ref	20 (15.0)	Ref
Employed	10 (23.8)	1.25 (0.68, 2.29)	4 (36.4)	1.44 (0.61, 3.41)	6 (19.4)	1.29 (0.56, 2.94)
Educational Attainment						
Less than High School	18 (22.5)	Ref	10 (30.3)	Ref	8 (17.0)	Ref
High School Graduate/GED	22 (21.0)	0.93 (0.54, 1.62)	11 (29.0)	0.96 (0.46, 1.96)	11 (16.4)	0.96 (0.42, 2.22)
Some College or Greater	12 (14.8)	0.66 (0.34, 1.28)	5 (17.2)	0.57 (0.22, 1.47)	7 (13.5)	0.79 (0.31, 2.02)
Marital Status						
Widowed/Divorced/Never Married	38 (19.2)	Ref	18 (26.1)	Ref	20 (15.5)	Ref
Married/Cohabiting as Married	14 (20.6)	1.07 (0.62, 1.86)	8 (25.8)	0.99 (0.48, 2.03)	6 (16.2)	1.04 (0.45, 2.41)
Ever Incarcerated						

	Total Sample		Women		Men	
	N (%) Avoided Treatment	PR (95% CI)	N (%) Avoided Treatment	PR (95% CI)	N (%) Avoided Treatment	PR (95% CI)
No	6 (16.2)	Ref	5 (21.7)	Ref	1 (7.1)	Ref
Yes	46 (20.1)	1.24 (0.57, 2.70)	21 (27.3)	1.25 (0.53, 2.96)	25 (16.4)	2.30 (0.34, 15.80)
3 or More Traumatic Experiences during Childhood						
No	15 (16.3)	Ref	8 (32.0)	Ref	7 (10.4)	Ref
Yes	32 (20.9)	1.28 (0.73, 2.24)	15 (23.1)	0.72 (0.35, 1.49)	17 (19.3)	1.85 (0.81, 4.21)
Non-Using Network Gave Tangible Support in Past 3 Mos						
No	21 (20.0)	Ref	9 (24.3)	Ref	12 (17.6)	Ref
Yes	31 (19.4)	0.97 (0.59, 1.59)	17 (27.0)	1.11 (0.55, 2.23)	14 (14.4)	0.82 (0.40, 1.66)
Non-Using Network Gave Emotional Support in Past 3 Mos						
No	12 (20.3)	Ref	4 (19.0)	Ref	8 (21.0)	Ref
Yes	40 (19.7)	0.97 (0.54, 1.72)	22 (27.8)	1.46 (0.56, 3.79)	18 (14.5)	0.69 (0.32, 1.46)
Age at First Opioid Use						
11–17 Years	15 (17.9)	Ref	5 (21.7)	Ref	10 (16.4)	Ref
18–21 Years	8 (16.3)	0.91 (0.42, 2.00)	5 (20.0)	0.92 (0.30, 2.78)	3 (12.5)	0.76 (0.23, 2.54)
22–29 Years	21 (35.6)	1.99 (1.12, 3.53)	12 (52.2)	2.40 (1.01, 5.72)	9 (25.0)	1.52 (0.68, 3.40)
30 or Older	8 (11.3)	0.63 (0.28, 1.40)	4 (14.3)	0.66 (0.20, 2.17)	4 (9.3)	0.57 (0.19, 1.69)
Injected Heroin in Past 30 Days						
No	39 (19.8)	Ref	18 (25.4)	Ref	21 (16.7)	Ref
Yes	11 (16.7)	0.84 (0.46, 1.55)	7 (25.9)	1.02 (0.48, 2.17)	4 (10.3)	0.62 (0.22, 1.69)
Opioid Use Disorder						
Mild/Moderate	5 (10.2)	Ref	4 (15.4)	Ref	1 (4.4)	Ref
Severe	44 (22.3)	2.19 (0.91, 5.24)	21 (30.4)	1.97 (0.75, 5.23)	23 (18.0)	4.13 (0.58, 29.23)
Ever Been in Opioid Use Treatment						
No	6 (33.3)	Ref	3 (37.5)	Ref	3 (30.0)	Ref
Yes	46 (18.6)	0.56 (0.28, 1.12)	23 (25.0)	0.67 (0.25, 1.75)	23 (14.7)	0.49 (0.18, 1.36)
Drug Use Stigma						
Low (score <13)	14 (10.9)	Ref	8 (15.7)	Ref	6 (7.8)	Ref

	Total Sample		Women		Men	
	N (%) Avoided Treatment	PR (95% CI)	N (%) Avoided Treatment	PR (95% CI)	N (%) Avoided Treatment	PR (95% CI)
High (score ≥13)	37 (27.4)	2.50 (1.42, 4.42)	18 (36.7)	2.34 (1.12, 4.89)	19 (22.1)	2.84 (1.19, 6.74)

Table 2

Associations between Parenting and Childcare Factors, Harm Reduction Service Engagement, and Overdose Risk (n = 403).

	Total Sample			Women			Men		
	N (%) with Outcome	PR (95% CI)	APR* (95% CI)	N (%) with Outcome	PR (95% CI)	APR* (95% CI)	N (%) with Outcome	PR (95% CI)	APR* (95% CI)
Ever Trained to Administer Naloxone									
Child Stayed with Them in Past Month									
No	121 (65.0)	Ref	Ref	38 (61.3)	Ref	Ref	83 (66.9)	Ref	Ref
Yes	47 (61.8)	0.95 (0.77, 1.17)	1.06 (0.86, 1.30)	17 (47.2)	0.77 (0.52, 1.15)	0.76 (0.52, 1.10)	30 (75.0)	1.12 (0.90, 1.39)	1.28 (1.01, 1.62)
Avoided Drug Treatment for Fear of Child Welfare Involvement									
No	141 (66.8)	Ref	Ref	43 (58.9)	Ref	Ref	98 (71.0)	Ref	Ref
Yes	28 (53.8)	0.80 (0.62, 1.06)	0.86 (0.67, 1.11)	13 (50.0)	0.85 (0.55, 1.30)	0.76 (0.51, 1.12)	15 (57.7)	0.81 (0.57, 1.15)	0.94 (0.68, 1.30)
Difficulty Accessing Harm Reduction Services due to Childcare									
No	151 (62.4)	Ref	Ref	49 (54.4)	Ref	Ref	102 (67.1)	Ref	Ref
Yes	18 (85.7)	1.37 (1.12, 1.68)	1.27 (1.03, 1.56)	7 (77.8)	1.43 (0.96, 2.13)	1.48 (1.03, 2.13)	11 (91.7)	1.37 (1.11, 1.68)	1.15 (0.90, 1.47)
Currently Has Naloxone									
Child Stayed with Them in Past Month									
No	97 (53.3)	Ref	Ref	30 (51.7)	Ref	Ref	67 (54.0)	Ref	Ref
Yes	36 (47.4)	0.89 (0.67, 1.17)	0.95 (0.71, 1.27)	14 (38.9)	0.75 (0.46, 1.22)	0.69 (0.43, 1.12)	22 (55.0)	1.02 (0.74, 1.41)	1.16 (0.83, 1.67)
Avoided Drug Treatment for Fear of Child Welfare Involvement									
No	115 (55.6)	Ref	Ref	37 (53.6)	Ref	Ref	78 (56.5)	Ref	Ref
Yes	19 (36.5)	0.66 (0.45, 0.96)	0.68 (0.46, 0.99)	8 (30.8)	0.57 (0.31, 1.06)	0.48 (0.26, 0.92)	11 (42.3)	0.75 (0.47, 1.20)	0.86 (0.55, 1.36)
Difficulty Accessing Harm Reduction Services due to Childcare									
No	123 (51.7)	Ref	Ref	41 (47.8)	Ref	Ref	82 (54.0)	Ref	Ref
Yes	11 (52,4)	1.01 (0.66, 1.55)	0.90 (0.57, 1.41)	4 (44.4)	0.93 (0.43, 2.00)	0.90 (0.42, 1.94)	7 (58.3)	1.08 (0.66, 1.78)	0.89 (0.50, 1.58)
Visited a Syringe Service Program in the Past 3 Months									
Child Stayed with Them in Past Month									
No	69 (36.9)	Ref	Ref	21 (33.9)	Ref	Ref	48 (38.4)	Ref	Ref
Yes	28 (36.4)	0.98 (0.69, 1.40)	1.07 (0.76, 1.51)	15 (41.7)	1.23 (0.73, 2.07)	1.26 (0.80, 1.98)	13 (31.7)	0.82 (0.50, 1.36)	0.94 (0.58, 1.50)
Avoided Drug Treatment for Fear of Child Welfare Involvement									
No	77 (36.2)	Ref	Ref	25 (34.2)	Ref	Ref	52 (371.)	Ref	Ref

	Total Sample			Women			Men		
	N (%) with Outcome	PR (95% CI)	APR* (95% CI)	N (%) with Outcome	PR (95% CI)	APR* (95% CI)	N (%) with Outcome	PR (95% CI)	APR* (95% CI)
Yes	21 (40.4)	1.12 (0.77, 1.63)	1.16 (0.84, 1.62)	12 (46.2)	1.35 (0.80, 2.28)	1.26 (0.79, 2.02)	9 (34.6)	0.93 (0.53, 1.65)	1.08 (0.66, 1.76)
Difficulty Accessing Harm Reduction Services due to Childcare									
No	90 (36.9)	Ref	Ref	34 (37.8)	Ref	Ref	56 (36.4)	Ref	Ref
Yes	8 (38.1)	1.03 (0.58, 1.83)	0.79 (0.46, 1.34)	3 (33.3)	0.88 (0.34, 2.31)	1.13 (0.54, 2.34)	5 (41.7)	1.14 (0.57, 2.31)	0.63 (0.31, 1.28)
Lifetime Opioid Overdose									
Child Stayed with Them in Past Month									
No	66 (35.1)	Ref	Ref	22 (34.9)	Ref	Ref	44 (35.2)	Ref	Ref
Yes	24 (31.2)	0.89 (0.60, 1.30)	0.95 (0.65, 1.40)	11 (30.6)	0.88 (0.48, 1.59)	0.84 (0.47, 1.48)	13 (31.7)	0.90 (0.54, 1.50)	1.05 (0.64, 1.71)
Avoided Drug Treatment for Fear of Child Welfare Involvement									
No	74 (35.6)	Ref	Ref	25 (33.8)	Ref	Ref	49 (35.0)	Ref	Ref
Yes	17 (32.7)	0.94 (0.61, 1.46)	1.09 (0.72, 1.63)	9 (34.6)	1.02 (0.55, 1.90)	0.97 (0.55, 1.71)	8 (30.8)	0.88 (0.47, 1.63)	1.21 (0.69, 2.15)
Difficulty Accessing Harm Reduction Services due to Childcare									
No	79 (32.2)	Ref	Ref	29 (31.9)	Ref	Ref	50 (32.5)	Ref	Ref
Yes	12 (57.1)	1.77 (1.17, 2.68)	1.53 (1.05, 2.23)	5 (55.6)	1.74 (0.90, 3.37)	1.61 (0.83, 3.11)	7 (58.3)	1.80 (1.06, 3.05)	1.48 (0.91, 2.40)
Opioid Overdose in Past Month									
Child Stayed with Them in Past Month									
No	51 (27.3)	Ref	Ref	15 (24.2)	Ref	Ref	26 (28.8)	Ref	Ref1.
Yes	25 (32.5)	1.19 (0.80, 1.77)	1.17 (0.78, 1.76)	9 (25.0)	1.03 (0.50, 2.12)	1.10 (0.52, 2.36)	16 (39.0)	1.36 (0.84, 2.17)	20 (0.75, 1.92)
Avoided Drug Treatment for Fear of Child Welfare Involvement									
No	61 (28.6)	Ref	Ref	18 (24.7)	Ref	Ref	43 (30.7)	Ref	Ref
Yes	15 (28.8)	1.01 (0.62, 1.62)	1.04 (0.65, 1.65)	6 (23.1)	0.94 (0.42, 2.10)	1.02 (0.45, 2.33)	9 (34.6)	1.13 (0.63, 2.02)	1.05 (0.60, 1.83)
Difficulty Accessing Harm Reduction Services due to Childcare									
No	69 (28.3)	Ref	Ref	21 (23.3)	Ref	Ref	48 (31.2)	Ref	Ref
Yes	7 (33.3)	1.18 (0.62, 2.23)	1.14 (0.60, 2.13)	3 (33.3)	1.43 (0.53, 3.88)	1.33 (0.45, 3.91)	4 (33.3)	1.07 (0.46, 2.46)	1.02 (0.48, 2.17)

*Adjusted for age, race/ethnicity, New York City borough of residence, current homelessness, injected opioids in the past 30 days.