



# History of parenting instability and lifetime suicidal behavior in people who inject drugs



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## ABSTRACT

Despite high rates of suicide in people who inject drugs, little is known about the risk factors for suicide related to childhood and family history in this population. We aimed to explore the relationship between the history of out-of-home care (OHC) and lifetime suicide attempts among people who inject opioids. Participants ( $N = 202$ ) were current injection opioid users with at least one previous episode of opioid maintenance treatment. They were recruited into a double-blind randomized controlled trial for opioid substitution treatment. Secondary analysis of baseline data was conducted from the European Addiction Severity Index and basic demographics questionnaires. A total of 81 (40%) participants reported a history of living in OHC and 27% reported attempting suicide. Participants who reported living in OHC were more likely to report lifetime suicide attempts compared to those who did not live in OHC. History of OHC and suicidal ideation were significant risk factors for suicide attempts adjusting for depression and anxiety. Highest rates of lifetime attempts were among participants who lived in a group home, foster care, and/or psychiatric facility. Living in OHC during childhood was significantly associated with higher rates of suicide attempts in our sample. Greater efforts should be made to provide children from vulnerable families with environments where stable one-to-one relationships can be cultivated.

## 1. Introduction

Rates of suicide among people who inject drugs (PWID) are extremely high (Murphy, 2000; Pompili, 2012) with estimates that people who use heroin are 14 times more likely to die by suicide than their peers in the general population (Darke and Ross, 2002). Around the globe, PWID also represent an underserved population who have limited, if any, access to health and psychosocial care and often these individuals are overlooked by the system altogether (United Nations, 2015). While there is substantial literature on risk factors for suicide in the general population, considerably less is known about suicidal behavior in PWID. The present study aims to address this knowledge gap.

The existing evidence on suicide risk factors among people who use heroin suggests that they generally parallel the risk factors reported for the general population, however, people who use heroin have extremely wider exposure to these risk factors (Darke and Ross, 2002). Looking at ACE as one of the factors, people with  $\geq 5$  ACEs are 7 to 10

times more likely to report problems, addiction to illicit drugs, and use of injectable drugs compared with people with 0 ACEs (Dube et al., 2003). Felitti et al. suggests a scheme that illustrates consequences of ACEs throughout the lifespan, starting with (1) ACEs in early childhood, continuing with (2) social, emotional and cognitive impairment; then (3) adoption of health-risk behaviors (e.g. drug use); (4) disease and social problems; and leading to (5) early death (e.g. suicide) (Felitti et al., 2019). Overall risk factors for suicide attempts in PWID suggested in the literature include psychological distress, such as severe depression and anxiety, history of trauma, ACEs, social dysfunction, little social support, and familial risk factors (Bronisch and Wittchen, 1994; Darke and Ross, 2002; Krausz et al., 1998; Mościcki, 1997; Murphy, 2000; Krausz et al., 2014, 1998; Linden et al., 2013; Spittal et al., 2007; Vila-Rodriguez et al., 2013).

In particular, familial risk factors have been identified as extremely important for suicide, such as families with history of separation, loss of a family member, divorce, and family stress (Darke and Ross, 2001; Krausz et al., 1998; Murphy et al., 1983; Rossow and Lauritzen, 2001).

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However, one factor that appears to stand out for people who use opiates in the study by Murphy et al. was that those who attempted suicide were more likely to report having lived in foster care or an orphanage (Murphy et al., 1983).

Literature indicates that suicide can be understood as a secondary response to a life crisis or psychiatric instability caused by feelings of neglect, or a lack of social support and love (Ehnvall et al., 2008; Brent et al., 1993; Werbeloff et al., 2015). Neglect, as a form of ACEs, is likely to be experienced among orphaned children living in institutional settings, which increases their vulnerability (Zapata et al., 2013). Johnson et al. found that out-of-home care (OHC) in early life predisposes children to behavioral and social impairments later in their life attributable to lack of consistent care because of shift work and high staff turnover provide very limited opportunities for children to form a high quality one-to-one relationships with their primary caregiver (Johnson et al., 2006).

The present paper explores the relationship between the experience of out-of-home care and lifetime suicide attempts in PWID. Specifically, we aimed to (1) assess whether PWID who attempted suicide are more likely to report an experience of OHC during their childhood compared to PWID who did not attempt suicide; (2) explicate the role of OHC on suicide attempts in the broader context of other suicide risk factors in this population; and (3) determine if specific forms of OHC pose a greater risk for suicidal behavior.

## 2. Methods

### 2.1. Participants

A total of 202 individuals participated in SALOME (Study to Assess Long-term Opioid Medication Effectiveness), a randomized double-blind, single site (Vancouver, Canada) controlled trial for substitution treatment of long-term illicit opioid use. The study was designed to test whether injectable diacetylmorphine (DAM) is as effective as injectable hydromorphone (HDM) in reducing illicit heroin use among chronic opioid-dependent individuals. Participants were current injection opioid users who had at least one previous episode of opioid maintenance treatment. Oviedo-Joekes et al. has previously published details of study design, recruitment, and screening procedures of the SALOME trial (Oviedo-Joekes et al., 2015). The study received ethical approval from the Providence Health Care / University of British Columbia Research Ethics boards. Participants provided written informed consent. Data was collected through standardized questionnaires at the beginning of the trial (baseline) and then regularly at three, six, nine, and twelve months by a trained and experienced research team. The present study is a secondary analysis of the baseline data only.

### 2.2. Measures

**Socio-Demographics and Ethnicity (SD).** The SD is a 14-item self-report questionnaire that collected socio-demographic characteristics of individuals including gender, age, ethnicity, education, housing, family, and childhood history. Childhood history with a focus on parenting, family separation and type of care was assessed through a series of questions beginning with: "Were you ever separated from your biological parents?" For participants who reported being separated from both biological parents during childhood, the age of separation and placement was further specified. A total of 12 options were listed: "1. Relative – without involvement of the Ministry; 2. Relative- with involvement of the Ministry; 3. Foster care (i.e. Ministry involvement and determined care); 4. Group home; 5. Training school; 6. Orphanage; 7. Residential school; 8. Adopted; 9. Boarding school; 10. Detention center; 11. Psychiatric facility; 12. Other, please specify". Given the large number of response categories, broad grouping variables were also created by collapsing responses into the following categories: 1) "Biological parents only" included participants who were never

separated from both biological mother and father at the same time; 2) "Adoptive parents" consisted of participants who reported being adopted and spent part of their childhood with adoptive parents; and 3) "Out-of-home and institutional care" which included all participants who reported the experience of being in at least one of the following: foster care, group home, training school, orphanage, residential school, boarding school, detention center, psychiatric facility, and other facility. Each participant was instructed to report all facilities as applicable and in addition, each participant could spend a portion of time in OHC and another portion with adoptive parents.

**European Addiction Severity Index (ASI)** (Kokkevi and Hartgers, 1995). The ASI is a multidimensional clinical and research instrument designed to assess participant's substance use, related problems, and evaluate treatment outcomes. The SALOME study used a shortened version of the original instrument. The primary domains covered with this instrument were medical status, employment and support status, substance use (alcohol / drug use), family / social relationships, legal status, and psychiatric status. The data related to psychiatric status were collected through the questions "Have you had a significant period, in which you have": "Attempted suicide?", "Experienced serious thoughts of suicide?", "Experienced serious depression?", and "Experienced serious anxiety or tension?", for both lifetime and the past 30 days. The ASI also yielded information on drug use to evaluate the lifetime history of substance use, current use, and the specific prescription and illicit drugs the participant has ever used and regularly uses. Participants also provided information on the length of regular heroin use in lifetime. The psychometric properties of the instrument were described in the literature (Scheurich et al., 2000).

### 2.3. Statistical analyses

The sample was divided into two groups: suicide attempters and non-attempters. Group differences were assessed using *t*-tests, chi-square, and Fisher's exact tests as appropriate. Logistic regression analysis was used to identify predictors of suicide attempts. Statistical significance level was set at  $p < 0.05$  (two tailed).

## 3. Results

**Table 1** presents the sociodemographic characteristics of the entire sample. Mean age within the sample was 44 years, 140 were men, 59 women, and 3 transgender-women. A total of 55 participants (27%) of the sample reported ever attempting suicide in which 24% of men, 37% of women, and none of three transgender participants reported attempting suicide in their life.

**Table 2** reports between suicide attempters and non-attempters. Attempters reported a significantly greater experience of OHC (58% vs. 33%,  $\chi^2 = 10.3$ ,  $p = 0.002$ ), suicidal ideation (95% vs. 19%,  $\chi^2 = 95.4$ ,  $p = 0.000$ ), depression (93% vs. 55%,  $\chi^2 = 25$ ,  $p = 0.000$ ), and anxiety (82% vs. 57%,  $\chi^2 = 10.6$ ,  $p = 0.001$ ), compared to non-attempters. Suicide attempters and non-attempters did not show any significant differences on length of heroin use, age of separation from biological parents, and length of separation.

To determine the relative contribution of OHC experience, suicidal ideation, depression, and anxiety on suicide attempts, these variables were regressed on suicide attempts using a stepwise binary logistic regression model (**Table 3**). Only suicidal ideation (Odds Ratio

**Table 1**  
Sociodemographic characteristics of the sample.

Men	140
Women	59
Transgender	3
Age (years)	Mean: 44.3; SD: 9.6

$N = 202$ .

**Table 2**

Comparison of suicide attempters and non-attempters on self-reported suicidal ideation, psychiatric conditions, heroin use, experience of out-of-home care, age of separation, and length of separation from biological parents.

variable type <sup>c</sup>	Attempters, n = 55			Non-attempters, n = 147			x <sup>2</sup> / t	df	p-value (2-tailed)
	% of attem.	Mean	SD	% of non-att.	Mean	SD			
Depression ever	01	92.7	–	55.1	–	–	25.022	1	0.000*
Anxiety ever	01	81.5	–	56.5	–	–	10.627	1	0.001*
Length of heroin use (years)	nu	–	14.9	9.4	–	15.6	0.469	200	0.237
Experience of OHC <sup>a</sup>	01	58.2	–	33.3	–	–	10.289	1	0.002*
Age of separation <sup>b</sup> (years)	nu	–	8.5	5.0	–	8.9	0.406	94	0.686
Length of separation (years) <sup>b</sup>	nu	–	9.5	5.0	–	9.1	–0.406	94	0.686
Suicidal ideation ever	01	–	–	–	–	–	95.379	1	0.000*
Had	–	94.5	–	19.0	–	–	–	–	–
Never had	–	5.5	–	81.0	–	–	–	–	–

N = 202.

\* p-value < 0.05.

<sup>a</sup> out-of-home care (OHC); lived in at least one of following living arrangements or facilities: Foster care, Group home, Training school, Orphanage, Residential school, Boarding school, Detention centre, Psychiatric facility, Other.

<sup>b</sup> total participants separated from biological parents, n = 96; attempters (n = 36), non-attempters (n = 60).

<sup>c</sup> variables: nu (numerical) or 01 (categorical, yes/no).

(OR) = 98.319; 95% Confidence Interval (CI) = (18.997, 508.850)) and experience of OHC (OR = 2.547; 95% CI = (1.018, 6.373)) emerged as significant associates of suicide attempts.

Table 4 compares who attempted suicide and those who did not on specific childhood living arrangements. A significantly lower percentage of participants who reported attempting suicide lived only with their biological parents compared to those who did not attempt suicide (35% vs. 59%, x<sup>2</sup> = 9.7, p = 0.002). In contrast, a significantly higher percentage had lived in out-of-home care of any kind (58% vs. 33%, x<sup>2</sup> = 10.3, p = 0.002) among those who attempted suicide compare to those who did not attempt. In the breakdown of specific facilities, those who reported attempting suicide were more likely to report living in foster care (38% vs. 18%, x<sup>2</sup> = 8.7, p = 0.005) and group home (26% vs. 10%, x<sup>2</sup> = 7.6, p = 0.012). Out of the seven people who reported being in psychiatric facility, all also reported having attempted suicide (100% vs. 0%, p = 0.000, Fisher's exact test).

**4. Discussion**

The present study found that 40% of participants had been separated from their biological parents and lived in some form of OHC during their childhood and adolescence. This rate is much higher compared to the general population, in which only about 1% have lived in out-of-home care (Farris-Manning and Zandstra, 2013; Pecora, 2010; White et al., 2008). Notably, participants who reported living in OHC were more likely to report lifetime suicide attempts compared to those who did not live in OHC. In addition, the experience of OHC and suicidal ideation were significant associates of suicide attempts among people who inject opioids, after adjustment for history of depression and anxiety. Moreover, only the experience of OHC itself, not the age and length of separation from biological parents or length of heroin use was associated with attempting suicide. Specifically, the highest rates of

lifetime attempts were reported among participants who have experienced living in a group home, foster care, and/or psychiatric facility.

The critical role that OHC could play on lifetime suicide attempts may be explained by the undeniable importance of early childhood experiences. For young children, it is especially difficult to function well in settings with large numbers of children, small numbers of staff, and lack of consistent care due to shift work and staff rotation (Johnson et al., 2006). Developmental psychology and attachment theory and research suggest that a child's emotional connection and one-to-one relationship with an adult caregiver is crucial for developing the ability to form high-quality relationships later in life and for developing resilience (Betancourt and Khan, 2008). Group homes provide far less opportunities to form stable attachments with caregivers and often provide limited psychosocial support during a child's early development (Ehnvall et al., 2008; Kleiman and Liu, 2013; Poudel-Tandukar et al., 2011; Susukida et al., 2016). Moreover, Susukida et al. (2016) described that individuals who perceived love and support from their caregivers during childhood had a 42–43% lower probability of lifetime suicidal ideation and that quality of family life is more important than the family structure (Susukida et al., 2016). Pecora (2010) suggest that children in foster care have higher rates of emotional and behavioral problems, related to adverse childhood events such as the loss of their biological family and familiar environments, placement challenges, rejection by foster parents and siblings, the stigma of being in care, and others.

There are multiple factors and comorbidities playing a role in the suicidal behavior of PWID, including psychopathology of various etiology, genetic influences and social isolation (Darke and Ross, 2002). The stress-diathesis model of suicidal behavior acknowledges depression as a common pathway to suicidal behavior but at the same time aims to differentiate depressed individuals who complete suicide from other depressed individuals. The model suggests acute stress, epigenetic

**Table 3**

Logistic regression analysis of suicidal ideation, depression, anxiety, and experience of out-of-home care on suicide attempts.

	Standard error	Wald	df	p-value	Odds ratio	95% Confidence Interval for Odds ratio	
						Lower	Upper
Suicidal ideation ever	0.839	29.924	1	0.000*	98.319	18.997	508.850
Depression ever	0.864	0.012	1	0.914	1.098	0.202	5.967
Anxiety ever	0.566	0.080	1	0.778	1.173	0.387	3.561
Experience of OHC <sup>a</sup>	0.468	3.992	1	0.046*	2.547	1.018	6.373

N = 202.

\* p-value < 0.05.

<sup>a</sup> out-of-home care (OHC); lived in at least one of following living arrangements or facilities: Foster care, Group home, Training school, Orphanage, Residential school, Boarding school, Detention centre, Psychiatric facility, Other.

**Table 4**  
Comparison of suicide attempters and non-attempters on various childhood living arrangements.

Care type	Attempters, n = 55 n (% of attempt.)	Non-attempters, n = 147 n (% of non-attempt.)	Total	$\chi^2$	df	p-value
Biological parents only	19 (34.5%)	87 (59.2%)	106	9.743	1	0.002*
Adoptive parents <sup>a</sup>	7 (12.7%)	13 (8.8%)	20	0.677	1	0.432
Out-of-home and institutional care; all <sup>a,b</sup>	32 (58.2%)	49 (33.3%)	81	10.289	1	0.002*
Foster Care	21 (38.2%)	27 (18.4%)	48	8.674	1	0.005*
Group Home	14 (25.5%)	15 (10.2%)	29	7.571	1	0.012*
Detention Centre	5 (9.1%)	16 (10.9%)	21	0.138	1	0.801
Psychiatric Facility	7 (12.7%)	0 (0.0%)	7	–	–	0.000 <sup>b,c</sup>
Orphanage	3 (5.5%)	2 (1.4%)	5	–	–	0.126 <sup>c</sup>
Training School	2 (3.6%)	1 (0.7%)	3	–	–	0.181 <sup>c</sup>
Boarding School	2 (3.6%)	1 (0.7%)	3	–	–	0.181 <sup>c</sup>
Residential school	0 (0.0%)	1 (0.7%)	1	–	–	1.000 <sup>c</sup>
Other	8 (14.5%)	17 (11.6%)	25	0.328	1	0.632

N = 202.

<sup>a</sup> Each participant was instructed to indicate all out-of-home care (OHC) facilities as appropriate and also each participant could spend some time in OHC and some time with adoptive parents.

<sup>b</sup> Lived in at least one of following living arrangements or facilities: Foster care, Group home, Training school, Orphanage, Residential school, Boarding school, Detention centre, Psychiatric facility, Other.

<sup>c</sup> p-value reported from Fisher's exact test when assumptions for chi-square test was not met.

\* p-value < 0.05.

effects, childhood adversity and characteristics such as impulsivity, aggression, pessimism, hopelessness and deficient problem solving might increase the likelihood of suicidal behavior (van Heering, 2012).

While the aim of this manuscript is to focus on the links related to familial history, it is important to keep in mind the complexity of the topic. The fact that children are removed from their biological families may already be an indicator of dysfunctional environment in their family of origin and placement in out-of-home care could be a secondary factor, adding to the complexity of the situation and possible trauma. Another situation is when intrinsic characteristics of the child, contributing to psychopathological and behavioral issues, result in child's placement in a psychiatric facility or other types of OHC (Cohen et al., 1990). In addition to gaining a better understanding of the dynamics of the family environment, which contributes to the decision of separation, it is also important to examine different system approaches. It is crucial to consider the best possible means of creating opportunities and cultivating a nurturing environment, whether this entails supporting the intact family in order to cope with a crisis situation or remove a child from a potentially traumatizing environment.

Understanding the different aspects of family history presented in this paper can inform both policy makers and healthcare professionals in clinical settings. First, the system may pay more attention to outreach and providing ongoing support for vulnerable families. However, under circumstances where separation from parents is imminent, increased effort should be made to provide environments where one-to-one relationship with caregiver can be cultivated rather than placement in group-based living arrangements. Second, these results can inform the design of treatment programs for people who use drugs. It is critical to acknowledge the individual history of a dysfunctional family life and the experience of OHC and address the high psychosocial needs of these individuals in order to prevent self-harm and support their overall mental health recovery.

#### 4.1. Limitations

Potential limitations of the present study include the use of self-report questionnaires. The ASI instrument is focused on variables related to addiction, thus questions related to suicide do not assess the suicidal behavior in-depth and may not cover situations such as parasuicidal behavior that participants may believe were life-threatening actions but did not label them as suicide attempts. The results are limited to participants' understanding of what actions and behaviors

can fall under the terms "Attempted suicide" and "Experienced serious thoughts of suicide". Secondly, the present study is a secondary analysis of previously existing data in which the assessment of family history was broad-based and thus prevented any additional in-depth analysis of how these factors contribute to suicidal behavior. Thirdly, the study has a relatively modest sample size that could result in an undersampling of OHC experiences and types of facilities.

#### Conflict of interest

All authors declare no competing interests.

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