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# The role of adverse childhood experiences as determinants of nonsuicidal self-injury among children and adolescents referred to community and inpatient mental health settings



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## ABSTRACT

The objectives of this study were to examine the prevalence of, and determine the effect of adverse childhood experiences on non-suicidal self-injury among children and adolescents referred to community and inpatient mental health settings. Data for this study were obtained from the interRAI Child and Youth Mental Health dataset. A total of 2038 children and adolescents aged 8–18 years (M = 12.49; SD = 2.88, 61.1% males) were analyzed. Binary logistic regression was fitted to identify predictors of non-suicidal self-injury as a function of adverse childhood experiences, depression, and social support while simultaneously controlling for age, gender, type of patient, legal guardianship, marital status of parents/caregivers, history of foster family placement, and mental health diagnoses. Of the 2038 children and adolescents examined, 592 (29%) of this clinical sample engaged in non-suicidal self-injury. In the multivariate logistic regression model, children and adolescents who were physically abused had 49% higher odds of engaging in non-suicidal self-injury and children and adolescents who were sexually abused had 60% higher odds of engaging in non-suicidal self-injury, when compared to their non-abused counterparts. Other predictors of non-suicidal self-injury include: older age, female gender, inpatient status, depression, attention deficit-hyperactivity disorder, disruptive behavior disorder, and mood disorders. Children and adolescents who had some form of social support had a 26% decrease in the odds of engaging in non-suicidal self-injury. Assessment procedures for indicators of mental health, particularly among children and adolescents with a history of adverse childhood experiences, should also take into account non-suicidal self-injury. In addition to bolstering social support networks, addressing depression and related emotion regulation skills in childhood may help prevent future non-suicidal self-injury behaviors.

#### 1. Introduction

The phenomenon of non-suicidal self-injury (NSSI), which is generally defined as "the direct, deliberate destruction of one's own body tissue in the absence of suicidal intent" (Nock & Favazza, 2009, p. 9), is now recognized globally as a major public health issue, with up to 70% of children and adolescents with mental health problems engaging in NSSI (Kaess et al., 2013; Thomassin, Shaffer, Madden, & Londi, 2016; Weismoore & Esposito-Smythers, 2010; Zetterqvist, Lundh, & Svedin, 2014). Historically, NSSI has been considered primarily as a symptom of borderline personality disorder (BPD) such that in the third edition of the *Diagnostic and* 

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Statistical Manual of Mental Disorders (DSM-III) of the American Psychiatric Association (American Psychiatric Association, 1980), it was classified as one of the defining symptoms of BPD and included behaviors such as "physically self-damaging acts, e.g., suicidal gestures, self-mutilation, recurrent accidents or physical fights" (American Psychiatric Association, 1980, p. 323). However, over time, NSSI has begun to be understood more broadly as a behavior requiring its own diagnostic category (Claes & Vandereycken, 2007; Muehlenkamp, 2005, 2014; Posner, Brodsky, Yershova, Buchanan, & Mann, 2014). In the DSM-5, NSSI was considered as an autonomous diagnostic category where it was listed in the appendix as one of the mental health conditions requiring further study. The authors of the DSM-5 have proposed the following definition of NSSI "in the last year, the individual has, on 5 or more days, engaged in intentional self-inflicted damage to the surface of his or her body of a sort likely to induce bleeding, bruising, or pain (e.g., cutting, burning, stabbing, hitting, excessive rubbing), with the expectation that the injury will lead to only minor or moderate physical harm" (American Psychiatric Association, 2013, p. 803).

Behaviors such as cutting, pinching, poking, scratching, sticking pins and needles into the skin, and hair pulling, that result in selfinjury but with no suicidal intent and causes less lethal damage to bodily tissue are classified as NSSI (Nock & Favazza, 2009), whereas behaviors, such as self-injury involving fire arms and medication overdose with suicidal intent are classified as suicidal selfinjury (SSI) (Messer & Fremouw, 2008; Muehlenkamp, 2014; Posner et al., 2014). Intent, lethality, and repetition/frequency are three important constructs that distinguish NSSI from SSI. For a detailed discussion of these constructs, the reader is referred to the following papers: Hamza, Stewart, and Willoughby (2012), Silverman, Berman, Sanddal, O'Carroll, and Joiner (2007a) and Silverman, Berman, Sanddal, O'Carroll, and Joiner (2007b).

#### 1.1. Prevalence estimates of NSSI among children and adolescents

Prevalence estimates of NSSI among children and adolescents vary widely as a result of a number of factors including the time since last episode of NSSI, number of NSSI episodes to be endorsed, population examined, as well as reasons for engaging in NSSI. Within the Canadian context, prevalence estimates typically range from as low as 7% in student samples (Duggan, Heath, & Hu, 2015), to as high as 77% in clinical samples (Preyde et al., 2014). Using the Deliberate Self-Harm Inventory (DSHI), Heath, Toste, Nedecheva, and Charlebois (2008) assessed NSSI among students from a large urban university in Montreal, Quebec, and found 11.7% of the students reported engaging in NSSI at some point in their life. In a longitudinal study, Preyde et al. (2012) examined data on 169 children and adolescents from five mental health agencies in southwestern Ontario and found that 57 (34%) of the participants engaged in NSSI at baseline. Of these 57 participants, 27 (47%) engaged in mild NSSI behaviors (e.g., repeated pinching), 23 (40%) engaged in severe NSSI behaviors (e.g., deep razor cuts), and 7 (12%) engaged in life-threatening NSSI behaviors (Preyde et al., 2012).

Studies from other jurisdictions have also reported wide variation in prevalence estimates of NSSI among adolescents in clinical samples ranging from 40% (Kaess et al., 2013) to 80% (Auerbach et al., 2014). A systematic review performed by Swannell, Martin, Page, Hasking, and St John (2014) to investigate the effect of methodological factors on NSSI in non-clinical samples found a pooled NSSI prevalence estimate among adolescents to be 17.2%. Swannell et al. (2014) also found that methodological factors contributed to more than half of the heterogeneity in prevalence estimates. In addition, Muehlenkamp, Claes, Havertape, and Plener (2012) undertook a systematic review of studies published between 2005 and 2011 on the prevalence rate of NSSI among adolescents and found the mean lifetime prevalence of NSSI across studies to be 18% (SD = 7.3%). They also found that assessing NSSI using a single item often results in a lower prevalence rate than assessment with a specific behavior checklist.

#### 1.2. Factors associated with NSSI

One consistent factor that has been identified as a significant predictor of NSSI among adolescents is adverse childhood experiences (ACEs) (Franzke, Wabnitz, & Catani, 2015; Glassman, Weierich, Hooley, Deliberto, & Nock, 2007; Gratz, 2006; Kaess et al., 2013; Zetterqvist et al., 2014). Yates (2009) observed that as much as 80% of those who engaged in NSSI reported having a history of ACEs. ACEs refer to distressing and/or traumatic events that occur during childhood, such as emotional, physical, and sexual abuse; emotional and physical neglect; caregiver risk factors such as of addiction or substance use, mental illness, incarceration, separation or divorce; and violent treatment of the mother (Saul et al., 2014).

Estimates based on data from the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS) suggest that the number of children and adolescents with investigated incidents of child abuse and neglect in Canada is on the rise (Trocmé et al., 2010). For instance, an estimated 135,261 investigated incidents of child abuse and neglect were conducted in Canada in 1998 representing a rate of 21.57 per 1000 children investigations. By 2008, this rate has increased to 39.16 investigations per 1000 children (235,842 child abuse and neglect related investigations) (Trocmé et al., 2010). According to the CIS-2008, more than two-thirds of the substantiated child maltreatment investigations were related to either witnessing domestic violence (34%) or neglect (34%), followed by physical abuse (20%), emotional abuse (9%), and sexual abuse (3%).

The extant literature has found a history of ACEs to be associated with increased likelihood of a number of negative outcomes later in life, including anxiety and depression (Coohey, Dirks-Bihun, Renner, & Baller, 2014; Greger, Myhre, Lydersen, & Jozefiak, 2015; Larkin, Felitti, & Anda, 2014), suicide attempt (Dube et al., 2001), alcohol, tobacco, and illicit drug use (Braciszewski & Colby, 2015; Traube, James, Zhang, & Landsverk, 2012), poor self-esteem (Arslan, 2016), and risky sexual behavior (Anda et al., 2006; Noll, Haralson, Butler, & Shenk, 2011). Other longitudinal studies (e.g., Lewis et al., 2011), systematic reviews and meta-analyses (Agnew-Blais & Danese, 2016; Maniglio, 2010, 2012) have also found a strong relationship between ACEs and mental health problems. Using data from the longitudinal study of child abuse and neglect, Lewis et al. (2011) found that history of ACEs predicted internalizing

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