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# Adverse childhood experiences and suicide attempts among those with mental and substance use disorders



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## ABSTRACT

Using the 2012–2013 National Epidemiologic Survey on Alcohol and Related Conditions data, we examined the associations of ten types of adverse childhood experiences (ACEs) with (1) lifetime suicide attempts and (2) number and age of attempts among U.S. adults aged 18+. In a case-control design, suicide attempters (5.14% of the full sample) were matched with never attempters (matched sample N = 3912) on nine mental and substance use disorders. ACE rates were higher among attempters (3.30 [SE = 0.07]) than their matched controls (2.19 [SE = 0.06]). Results from multivariable logistic regression analyses showed that sexual abuse and parental/other family member's mental illness were associated with increased odds of having attempted suicide among both genders, and emotional neglect was also a factor for men. Population attributable risk fractions for sexual abuse were 25.75% for women and 8.56% for men. Sexual abuse and a higher number of ACEs were also related to repeated suicide attempts. A higher number of ACEs was associated with a younger first attempt age. Gay/bisexual orientation in men and the lack of college education in both genders were significant covariates. In conclusion, this study underscores that ACEs are significantly associated with lifetime suicide attempts even when mental and substance use disorders are controlled.

## 1. Introduction

The U.S. Centers for Disease Control & Prevention (CDC) data show that in 2014, 14.6% of students (19.4% of females and 9.8% of males) in grades 9–12 made a suicide plan, and 8.6% of students (11.6% of females and 5.5% of males) attempted suicide one or more times (CDC, 2016a). About one third of these young suicide attempters required medical attention for an injury, poisoning, or overdose resulting from their suicide attempt (CDC, 2016a). In 2014, an estimated 2.7 million adults aged 18+ years (1.2% of females and 1.0% of males) made a suicide plan, and 1.1 million (0.5% of females and 0.4% of males) attempted suicide, with significantly higher rates of attempts among 18–25 year olds (1.5% of females and 1.0% of males) than among older age cohorts (Lipari, Piscopo, Kroutil, & Miller, 2015).

The rates of suicide attempts among all age groups remained stable in recent years (CDC, 2016a; Lipari et al., 2015). However, National Center for Health Statistics data show that between 1999 and 2014, the U.S. age-adjusted suicide rate increased 24%, from 10.5 per 100,000 population to 13.0, with the greatest increases after 2006 (Curtin, Warner, & Hedegaard, 2016). Increases occurred for those aged 10–74 and for both genders, with increases for females greatest for those aged 10–14 and for males aged 45–64 (Heron, 2016). Given the large numbers of suicide attempts and rising suicide rates, risk and protective factors for suicidal behaviors need

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additional study. In the present study, using recent epidemiologic data, we further examined the relationship between adverse childhood experiences (ACEs, i.e., childhood maltreatment and family dysfunction) and self-reported lifetime suicide attempts among the U.S. population aged 18+ years.

Previous research shows that ACEs are significantly associated with suicide attempts throughout the lifespan and with an earlier age at first suicide attempt (Afifi et al., 2008; Dube et al., 2001; Enns et al., 2006; Felliti et al., 1998; Fuller-Thomson, Baird, Dhrodia, & Brennenstuhl, 2016; Molnar, Berkman, & Buka, 2001; Sachs-Ericsson, Rushing, Stanley, & Sheffler, 2016). Dube et al. (2001) found: (1) any type of ACE increased the risk of attempted suicide (from 2-fold for those with a mentally ill household member or separated/divorced parents to 5-fold for emotional abuse); (2) the number of ACEs (1 through 7+) had a strong, graded relationship to attempted suicide during childhood/adolescence and adulthood, although adjustment for illicit drug use, depressed affect, and self-reported alcoholism reduced the strength of the relationship; (3) population-attributable risk factors (PAF) show that in the absence of one or more ACEs, the risk of lifetime, adult, and childhood/adolescent suicide attempts would have been reduced by 67%, 64%, and 80%, respectively. (PAF is the proportional reduction in an outcome that would occur if exposure to a risk factor [e.g., sexual abuse] was reduced to an alternative ideal exposure scenario [e.g., no sexual abuse]). Based on U.S. National Comorbidity Survey Replication data, Afifi et al. (2008) also found that about 30% of suicide attempts among women and 23% of those among men were attributable to having experienced any of three ACEs (physical abuse, sexual abuse, and witnessing domestic violence). Other population-based studies found that childhood sexual abuse, which is more common among women than among men, is more closely associated with suicide attempts than other types of child maltreatment, indicating its stronger pernicious effects on overall psychopathology (Brodsky & Stanley, 2008; Dube et al., 2005; Hoertel et al., 2015; Joiner et al., 2007; Pérez-Fuentes et al., 2013). Even when other types of childhood adversities were controlled, childhood sexual abuse was significantly associated with subsequent onset of five mood, anxiety, and substance use disorders among men and 14 among women (Molnar et al., 2001).

Mood disorders, post-traumatic stress disorder (PTSD), substance misuse/disorders, and/or maladaptive psychosocial development are found to mediate the relationship between childhood abuse/neglect and suicidal behaviors (Dube et al., 2001; Enns et al., 2006; Fuller-Thomson et al., 2016; Perez, Jennings, Piquero, & Baglivio, 2016; Sachs-Ericsson et al., 2016). Severe stress and/or traumatization from ACEs can interact with genetic dispositions and epigenetic mechanisms, resulting in long-lasting neurobiological changes, psychological and personality traits, mental disorders, and vulnerability to stress and stress-related health conditions that contribute to suicidal behaviors (Brady & Back, 2012; Brodsky, 2016; Ehlert, 2013; Guillaume et al., 2013; McCrory & Mayes, 2015). Early life adversities can also contribute to specific life events or stressors related to the original trauma that might trigger the propensity for suicidal behaviors (Brodsky, 2016).

The interpersonal theory of suicide (Van Orden et al., 2010), which posits that the most dangerous form of suicidal desire is caused by thwarted belongingness and perceived burdensomeness (and hopelessness about these states), may also explain high rates of suicide attempts among those who have experienced ACEs. The theory further posits that engaging in suicidal behavior requires the capability/acquired capability for self-harm, which includes increased pain tolerance and reduced fear of death. Children/adolescents who were abused and/or experienced other family dysfunction may develop suicidal desire from the sense of isolation, self-blame, self-hatred, shame, and believing that their family does not need them or their family would be better off if they were dead (Van Orden et al., 2010). ACEs' long-term effects and resulting psychopathology may also increase vulnerability for self-harm and suicide during times of distress in adulthood due to hopelessness from feelings of disconnectedness and perceived sense of being a liability. Adversity experienced during early, key developmental stages is also likely to contribute to impaired affect regulation and impulsivity (McCrory & Mayes, 2015; Whitesell, Beals, Mitchell, Manson, & Turner, 2009), which may in turn increase the capability for self-harm and suicide throughout the lifespan.

While previous research shows that ACEs are related to increased risks for suicide attempts throughout the lifespan, most studies have focused on only a few types of child maltreatment. As different types of ACEs tend to co-occur, they should be evaluated together to assess the influence of each type while controlling for other types. In addition, although most previous studies have controlled for mood and/or anxiety disorders, a more extensive list of mental and substance use disorders that are risk factors for suicide attempts also need to be controlled. Based on previous studies and the interpersonal theory of suicide, we tested the following hypotheses: (H1a) greater numbers of ACEs will be associated with a higher likelihood of lifetime suicide attempts; and (H1b) childhood sexual abuse, physical abuse, emotional neglect, and parental/other family members' mental illness will be significantly associated with lifetime suicide attempts. Then, we examined relationships between numbers and types of ACEs with number of suicide attempts and the first and the most recent ages of attempts among lifetime suicide attempters. Our hypotheses were: (H2a) greater numbers of ACEs and (H2b) sexual abuse will be significantly associated with increased odds of more suicide attempts; and (H3a) greater numbers of ACEs and (H3b) sexual abuse will be significantly associated with younger age at first suicide attempt.

## 2. Method

### 2.1. Data and sample

A limited access data set, based on the 2012–2013 U.S. National Epidemiologic Survey on Alcohol and Related Conditions (NESARC-III), sponsored by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), was the study's data source. NESARC-III is based on a national probability sample survey of the civilian noninstitutionalized population aged 18+ years residing in the United States (N = 36,309). The data include information on alcohol and other substance use and related substance use, physical, and mental disabilities/disorders that were collected using the NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS-5), a semi-structured diagnostic interview using computer-assisted personal interviewing (CAPI). Based on the

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