



# Rates of Recent Adverse Childhood Experiences Among Indigenous Children

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## Abstract

The current paper describes rates of recent (past six months) adverse childhood experiences (ACEs) and examines the association of ACEs with cultural connection and depressive symptoms among Indigenous children aged 10 to 14 ( $N=177$ ; mean age = 11.8; 48.3% boys; 44.3% girls; 7.4% another gender identity). Children completed baseline surveys as part of a larger evaluation of a culturally grounded, strengths-focused, family-based program to prevent ACEs. Surveys included an inclusive measure of ACEs developed for the current study, an adapted measure of connection to culture, and the Children's Depression Screener. Results for ACEs indicated that 18.6% of Indigenous children reported none, 37.2% reported one to three, and 44.2% reported four or more in the past six months. Importantly, children who reported no ACEs reported greater cultural connection than children who reported one to three ACEs. Depressive symptoms were higher among children who reported one to three and four or more ACEs compared to children who reported no ACEs.

**Keywords** Adverse childhood experiences · Indigenous · Native American · Depressive symptoms · Cultural connection

## Introduction

Adverse childhood experiences (ACEs; experiences before the age of 18 that undermine individuals' sense of safety and connection with others) are a significant public health problem in the U.S. (Merrick, 2019). Indigenous children experience disproportionately high rates of ACEs due to both compounding historical traumas (e.g., cultural genocide), as well as current inequities (e.g., racism; Giano et al., 2021). Moreover, one in three Indigenous children lives in poverty,

an ACE itself and a risk factor for other ACEs (Children's Defense Fund, 2020; Walsh et al., 2019). ACEs have deleterious effects for physical and mental health (Hughes et al., 2017). Furthermore, child maltreatment alone (a type of ACE) costs \$428 billion per year (Peterson et al., 2018). Thus, the prevention of ACEs is a critical health priority. The purpose of the current paper was to describe rates of ACEs among Indigenous (predominantly Lakota) *wakanyeya* (sacred little ones or children in Lakota). We also explored the association of ACEs with depressive symptoms and cultural connection.

## Adverse Childhood Experiences

The ACEs framework describes experiences occurring before the age of 18 that may be traumatic, making children feel unsafe, emotionally distressed, and/or disconnected from other people (CDC, 2022). A number of experiences are considered to be ACEs: sexual, physical, or emotional abuse; neglect; exposure to caregiver intimate partner violence, substance use, mental illness, or criminal behavior; poverty; neighborhood violence; discrimination or racism; parental health; parental separation; exposure to foster care; and life-threatening illness (Finkelhor et al., 2015; Bethell

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*Disclaimer:* The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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et al., 2017). Rates of ACEs among the U.S. population are concerning; about 61% of adults report at least one ACE, and about 1 in 6 report four or more ACEs (CDC, 2022).

ACEs are associated with numerous negative physical and mental health outcomes. According to a meta-analysis of 37 papers, individuals with four or more ACEs reported poorer health and were more likely to report cancer, heart disease, diabetes, and respiratory disease, compared to others with fewer ACEs. Individuals with four or more ACEs also reported more mental health problems, self-directed violence, and problematic alcohol and drug use than did other individuals (Hughes et al., 2017). A second meta-analysis of 96 papers found similar results, with higher ACE scores associated with gastrointestinal disease, respiratory disease, sleep problems, depressed mood, alcohol and drug use, suicidal ideation, and anxiety (Petruccioli & Berman, 2019). Higher ACE scores are correlated with several biomarkers indicating health problems and aging, such as inflammation, obesity, telomere length, and cortisol levels (Deighton et al., 2018).

### Adverse Childhood Experiences Among Indigenous Children

Indigenous children experience ACEs at alarmingly high rates (Richards et al., 2021; Warne et al., 2017). In a study in South Dakota (the location of the present study), 83% of Indigenous adults reported at least one ACE, whereas 50% of non-Indigenous adults reported at least one ACE (Warne et al., 2017); this statistic illustrates a large disparity in ACEs. Moreover, in a nationally representative sample of adults, Richards and colleagues (2021) documented Indigenous individuals reported a greater number of ACEs than did any racial or cultural group, as well as the greatest number of types of ACEs. To date, no studies, to our knowledge, have examined rates of recent ACEs (e.g., the past six months) as reported by Indigenous children, which is important given that there could be recall bias with having adults report on events that took place decades ago. Further, measuring correlates of recent ACEs may help us identify risk and protective factors most relevant to children themselves, whereas retrospective research only helps elucidate the risk and protective factors that are relevant to adults looking back on their experiences.

For Indigenous children, ACEs are rooted in colonization (when Europeans came to the U.S. and exerted dominance over Indigenous communities) and multiple historical traumas (e.g., cultural genocide, forced placement in boarding schools) (Running Bear et al., 2018; Deer, 2015; Brave Heart, 1999), as well as ongoing systemic oppression that produces egregious health disparities (Bailey et al., 2021; Braveman et al., 2017). Historical trauma is cumulative

emotional and psychological wounding that spans generations resulting from group trauma; for Indigenous people, historical traumas include mass genocide, colonization of land including spiritually significant sites, forced assimilation and erasure of culture, and forced placement of children into boarding schools where there were high rates of abuse (Brave Heart et al., 2011; Zephier Olson & Dombrowski, 2019). Scholars and traditional healers alike point to historical trauma response, in which unresolved historical grief manifests as various behavioral and mental health symptoms, including anger, anxiety, depression, and substance use, to explain how these historical events affect present day Indigenous individuals (Brave Heart, 2003). Current systemic oppression and inequities also contribute to ACEs, such as higher rates of poverty, lower access to healthcare, racialized violence, loss of caregivers to drugs, suicide, or incarceration, and racism experienced in the community and schools (Carr, 2020; Choi et al., 2019; Cronholm et al., 2015; Edwards et al., 2022; Radford et al., 2021).

### Adverse Childhood Experiences and Cultural Connection

The Indigenist Ecological Systems Model highlights the centrality of historical context and culture for development. This context includes intergenerational learning of Indigenous knowledge, values, and customs that are key to healthy development. This model highlights how connection to culture (as defined by feelings of attachment to culture as well as frequency of participating in culture practices) instills strengths such as interconnectedness and resilience (O'Keefe et al., 2022). In the current study, children's connection to culture is conceptualized as how often the child's family does special traditions together, how often the child's family follows the way of life of their cultural group, and the child's feelings of pride, knowledge, and connection to their culture. The idea of cultural connection is a newer concept compared to ancient concepts of *Lakol wicohanki*, the Lakota way of life (in the current study, most children identified as Lakota). These life ways were learned through elders, daily practices with family and community, and role modeling. Cultural genocide that occurred during colonization (Richards et al., 2021) contributes to current-day variation in cultural connection.

In addition to affecting cultural connection, cultural genocide is a major contributor to ACEs among Indigenous families (Richards et al., 2021). Historically, state-sponsored policies such as boarding schools purposefully separated children from their families and culture (Zephier Olson & Dombrowski, 2019). Today, data shows that Indigenous children are placed in foster care at higher rates (Yi et al., 2020), again causing disproportionately high rates

of children who are separated from families and culture. In contrast to separation from culture, feelings of cultural connection are an important protective factor, as shown by both the wisdom of Elders/Traditional Knowledge Keepers (e.g., Hawk Wing, 2022), as well as quantitative research (Radford et al., 2021). Indeed, there has been a historical and current emphasis among Indigenous relatives on the importance of reconnection to culture and cultural identity development. Further, there is a growing emphasis on this important factor within the scientific prevention/intervention community (Walters et al., 2020). Thus, the current paper focused on children's connection to culture, and is among the first studies to examine the role of culture as reported by children themselves, whereas most studies on this topic have focused on retrospective adult reports (Radford et al., 2021). The current paper is cross-sectional, and thus, we cannot examine causality. History and theory suggest that cultural connection is a strong protective factor for ACEs; it is also possible that ACEs (e.g., family separation) could lead to loss of cultural connection. The current cross-sectional study represents a start to a much-needed area of scholarship that has direct implications for practice and a foundation on which future longitudinal, prospective research can build.

### Adverse Childhood Experiences and Depressive Symptoms

Mental health challenges, including depressive symptoms, is one of the most frequent outcomes of ACEs (Hughes et al., 2017). The stress process model is one theory that explains how adverse environments impact individuals. According to this model, negative external events, negative relational events, and cognitive emotional stressors lead to distress, ultimately impacting well-being including depressive symptoms levels (Sandin et al., 1998). Historical trauma as well as present-day oppression, such as racism and poverty, are negative external and relational events that fit within this model (Aneshensel & Mitchell, 2014). Regarding depression as an outcome of ACEs, one study found that youth aged 10 to 17 with multiple ACEs were more likely than other youth to experience depression (Lee et al., 2020). A study of children and adolescents aged 8 to 17 reported similar findings (Elmore & Crouch, 2020). Although adult depressive symptoms as an outcome of ACEs have been the subject of much research (Hughes et al., 2017), the current paper reports on depressive symptoms among children 10 to 14 (Zare et al., 2018). The current paper differs from previous work in that it focuses on recent ACEs, those occurring during the past six months, which will indicate the proximal links between ACEs and depression. Previous studies do not often focus on proximal linkages. For example, a

recent study of ACEs and adolescent mental health found that ACEs experienced in very early childhood (first 5 years of life) were associated with depressive tendencies in both boys and girls aged 14 to 18 (Gajos et al., 2022). Further, most research on ACEs and depression among Indigenous individuals focuses on adults (e.g., Roh et al., 2014) or older adolescents (e.g., the age range in Brockie et al., 2015 was 15 to 24), with very few on Indigenous children or younger adolescence (for an exception, see Kenney & Singh, 2016, age range 0 to 17). Although it is intuitive that one would expect an association between depression and ACEs among Indigenous children, in the absence of empirical data we should not make such conclusions. The age range in the current paper was 10 to 14.

### The Current Paper

According to the ecological perspective, individuals' health is impacted by multiple social influences (e.g., McLeroy et al., 1988). These might include proximal events such as ACEs; proximal events may be impacted by broader influences such as culture. Using a cross-sectional design, the purpose of the current study was to identify rates of recent ACEs, and to explore the association of ACEs with cultural connection and depressive symptoms among children aged 10 to 14 who identifies as Indigenous (predominantly Lakota). The current study extends prior work. First, this study includes self-report data from children themselves; most previous research uses adult retrospective reports or caregiver reports (e.g., Radford et al., 2021). Second, the children in this study identified as Indigenous; given high rates of ACEs among the Indigenous population and the dearth of research, it is particularly important to study cultural connection. The current study's findings can be used to inform the immediate development of culturally-grounded, strengths-focused prevention and response initiatives for ACEs among Indigenous children and their families. Specific aims were as follows:

**Aim 1** Present descriptive statistics of recent ACEs.

**Aim 2** Examine mean differences in cultural connection among children with various experiences of ACEs; and examine mean differences in cultural connection between children who experienced 0 ACEs, 1–3 ACEs, and 4 or more ACEs.

**Aim 3** Examine mean differences in depressive symptoms among children who have various experiences of ACEs; and examine mean differences in depressive symptoms between

children who experienced 0 ACEs, 1–3 ACEs, and 4 or more ACEs.

## Method

### Research Design and Setting

Data are from a larger randomized controlled trial (RCT) designed to evaluate a culturally grounded, strength-focused, family-based program to prevent ACEs. The project took place in a small-sized city in the Northern Great Plains region of the U.S. This city is proximal to several rural, large, and impoverished Indigenous Reservations. To be eligible, children had to be aged 10 to 14 and identify as either Indigenous/Native American, and/or from a family living below the poverty line as determined by a series of screener questions.

The current study is cross-sectional, using only baseline data from the larger study. The current study also only included children who identified as Indigenous/Native American (91.7% of the entire sample). Caregivers also took surveys, but were not included given the aims of the current study.

### Participants

Participants in the current study were Indigenous children aged 10–14 ( $N=177$ ) from 117 families. In the current paper, although individuals aged 10–14 might be considered adolescents, the term children is the preferred term of Indigenous community members. The mean age of children was 11.8 years ( $SD=1.4$ ). Children identified as boys ( $n=85$ ; 48.3%), girls ( $n=78$ ; 44.3%), and another identity ( $n=13$ ; 7.4%; e.g., non-binary, Two Spirit). According to data from caregivers (see Edwards et al., 2023), nearly half of families (43.5%) reported incomes under \$10,000, 19.6% reported incomes of \$10,001 to \$20,000, 13.0% reported incomes of \$20,001 to \$30,000, and 23.9% reported incomes of more than \$30,001. Children reported their grade level ranging from 2nd to 9th grade. Most children were in 4th grade (10.73%), 5th grade (18.64), 6th grade (23.16), 7th grade (24.86%), and 8th grade (12.99%). The average number of children per family was 1.51.

### Procedures

A variety of recruitment methods were used for the larger RCT. First, we posted recruitment ads on Facebook and boosted them so that individuals in the city and surrounding areas (up to a 15-mile radius) would see the ad. The

social media ads reached over 30,000 people and received over 4,000 likes, comments, shares, and clicks. Second, we knocked on approximately 200 doors in key neighborhoods. Our target population included Indigenous children aged 10–14 and their caregivers and/or families living below the poverty line. Neighborhoods with our target population were identified using publicly available census data coupled with income guidelines as well as knowledge of Indigenous staff immersed in the community. Third, we recruited at store fronts, as well as approximately ten events frequented by families, such as holiday and cultural events. Fourth, we held recruitment events such as a chili dog feed, where families could stop by for a meal and information about the project. Fifth, we posted fliers in community centers and businesses. Sixth, we asked community partners such as the local domestic violence programs, after-school programs, and other children-serving organizations to distribute fliers and tell eligible families about the project. Seventh, staff used their knowledge of the community to recruit families less likely to be reached by other methods described above (e.g., families without houses or transient families). Families enrolled in the project also told other families about the project.

All interested families contacted the project team for a screening call; some families were screened in person, on Facebook chat, and/or via text or email (depending on their preference). Families eligible to participate and interested then met a project staff to complete consent/assent. Written consent was gathered from all caregivers for their own participation. Legal guardians (usually the same caregiver who completed their own survey) consented for their child to participate, and children provided written assent. Legal guardians also provided consent for other caregivers to participate in programming sessions with their child when applicable. After consenting, participants completed a baseline survey. All surveys were collected on paper and administered by trained research assistants or project managers. Surveys were completed at the program's location (a local church), at the project office, or on rare occasions when transportation was prohibitive, at participants' homes. Surveys were double entered by research assistants to ensure accuracy.

Participants received \$30 in cash for completing the surveys. Participant confidentiality was ensured via a Certificate of Confidentiality from the CDC, and the study was approved by the [masked for review] IRB and the Indian Health Service IRB. The publication of this paper was approved by the Indigenous Advisory Board and the Indian Health Services IRB.

## Measures

### Adverse Childhood Experiences

This measure was developed using other commonly used instruments of ACEs (Bethell et al., 2017) for this study to be inclusive of all possible ACEs (for information on the development of this measure and psychometrics see Waterman et al., 2023). Items for this measure were adapted after reviewing previous ACEs measures (Bethell et al., 2017). Response options included *yes* (1) or *no* (0). For example, “In the past 6 months, did you or another adult in your house or family swear at, insult, or put down one or more of your children ages 10 to 14 (participating in this project)?” Children responded to 29 questions about their own experiences in the past 6 months. Consistent with previous research (Crouch et al., 2019; Merrick et al., 2019), and given the highly skewed nature of the ACEs construct, we examined ACEs in three groups: 0 ACEs, 1–3 ACEs, and 4+ ACEs.

### Connection to Culture

This measure was adapted from the Orthogonal Cultural Identification Measure (Oetting & Beauvais, 1990) and from items created for previous research on a nearby Indian Reservation (Edwards et al., 2020). Children were asked to answer seven questions based on their own experiences about their connection to their culture on a scale from *not at all* (0) to *a lot* (3). For example, “How much does your family do special things together or have special traditions that are based on Native American/ Indigenous/ Lakota/ Nakota, Dakota culture?” A composite score was created from the mean of items, such that higher scores indicated higher levels of connection to culture. Internal reliability for this measure was good ( $\alpha=0.82$ ).

### Depressive Symptoms

Children were asked to answer eight questions about how much they agreed or disagreed with each statement from the Children’s Depression Screener (ChilD-S; Frühe et al., 2011). Response options ranged from *strongly disagree* (0) to *strongly agree* (3). For example, “I am happy” and “I worry a lot.” Items were summed so that scores indicated higher levels of depressive symptoms. Internal reliability for this measure was good ( $\alpha=0.83$ ).

### Analysis Plan

Analyses were conducted using Stata Version 17. Regarding Aim 1, we conducted a frequency analysis on each type

of ACE, as well as for 0 ACEs, 1–3 ACEs, and 4+ ACEs groups. Regarding Aim 2, we conducted a series of *t*-tests comparing mean differences in cultural connection between individuals who did and did not experience each particular ACE item (e.g., comparing mean cultural connection among children who experienced neighborhood violence to mean cultural connection of children who had not experienced neighborhood violence). Before we conducted *t*-tests, we tested for equality of variance between two groups; when appropriate, unequal variances were accounted for in analysis using Satterthwaite’s degrees of freedom. We also used a one-way ANOVA to compare mean differences in cultural connection among children in three groups (0 ACEs, 1–3 ACEs, and 4+ ACEs). We then used Bonferroni comparisons to test pairwise differences. Analyses for Aim 3 were identical to Aim 2, except that all tests included depressive symptoms instead of cultural connection. Across all measures, missing data ranged from 1.69 to 6.78% (we used listwise deletion).

## Results

### Aim 1: Rates of ACEs

Descriptive statistics for ACEs, cultural connection, and depressive symptoms are presented in Table 1. Of note, most Indigenous children reported experiencing at least one ACE in the past six months (81.4%). Few children reported no experience of ACEs (18.6%), 37.21% experienced 1–3 ACEs, and 44.19% experienced four or more ACEs. The most frequently reported ACEs were neighborhood violence (42.94%), caregiver depressive symptoms (38.46%), caregiver anger (37.13%), caregiver anxiety (36.47%), having something stolen from the family (32.57%), and caregiver death (31.74%).

### Aim 2: Cultural Connection

*T*-test analyses revealed that cultural connection did not differ between ACEs groups in the individual item analysis (see Table 2). We could not include the following items due to low cell size (less than 5 children reported): sexual abuse (someone touched you), sexual abuse (someone made you touch them), domestic violence (saw someone use a weapon), and someone broke into the home. ANOVA analyses suggested that ACE groups were different in cultural connection (Table 4). According to follow-up analyses, the no ACEs group reported higher cultural connection than did the 1–3 ACEs group.



**Table 1** Descriptive statistics

ACE (past 6 months)	<i>N</i> (valid %)
Verbal abuse	31 (18.24)
Afraid of being hurt	15 (8.77)
Physical abuse (pushing)	16 (9.30)
Physical abuse (hitting)	15 (8.88)
Sexual abuse (touching you)	1 (0.59)
Sexual abuse (touching adult)	1 (0.59)
Not enough to eat	14 (8.38)
Adult couldn't care for you	17 (10.30)
Domestic violence (pushing)	8 (4.76)
Domestic violence (kicking)	9 (5.17)
Domestic violence (weapon)	2 (1.16)
Caregiver alcohol use	19 (10.98)
Caregiver drug use	8 (4.60)
Caregiver depressive symptoms	65 (38.46)
Caregiver anger	62 (37.13)
Caregiver anxiety	62 (36.47)
Caregiver suicidality	10 (5.88)
Caregiver incarceration	41 (23.98)
Poverty	29 (17.47)
Neighborhood violence	73 (42.94)
Someone stole from family	56 (32.75)
Someone broke into home	4 (2.33)
Racism	13 (7.69)
Caregiver death	53 (31.74)
Caregiver divorce	25 (15.15)
Foster care	7 (4.14)
Visit from police or social worker	27 (15.98)
Illness (hospital)	9 (5.29)
Illness (worried I might not get better)	45 (26.79)
0 ACEs	32 (18.60)
1–3 ACEs	64 (37.21)
4+ ACEs	76 (44.19)
Construct	Mean (SD)
Cultural connection	2.12 (0.53)
Depressive symptoms	9.48 (4.90)

*Note:* ACE=adverse childhood experience. Percentages are valid among participants who responded to the question

### Aim 3: Depressive Symptoms

*T*-test analyses revealed that depressive symptoms were higher among children who reported ACEs compared to those who did not among the following: verbal abuse, physical abuse (afraid of being hurt), physical abuse (hitting), caregiver alcohol use, caregiver depression, caregiver anger, caregiver anxiety, caregiver suicidality, caregiver incarceration, neighborhood violence, racism, caregiver separation, having a police officer or social worker visit the home, and significant illness (Table 3). ANOVA analyses revealed that ACE groups were significantly different on depressive symptoms (Table 4). According to follow-up analyses, the no ACE group was lower on depressive symptoms than the 1–3 ACEs group and the 4+ ACEs group.

## Discussion

The purpose of the current paper was to identify rates of recent ACEs using a cross-sectional study, and to explore the association of recent ACEs with cultural connection and depressive symptoms. The current paper added to the literature by examining a sample of Indigenous children, and by exploring ACEs in the past six months (as opposed to lifetime ACEs). Further, the current paper presented self-report data from children themselves (as opposed to caregiver reports or retrospective reports by adults). This method may increase accuracy by not relying on retrospective reports. Further, this method gives insights into children's current experience, not their retrospective view of their childhood.

Regarding rates of ACEs, the vast majority (over 80%) of Indigenous children reported at least one ACE in the past six months and among children reporting ACEs, the majority reported multiple ACEs. Caregiver mental health and substance use were the most endorsed ACEs and nearly one in five children reported past six-month verbal abuse by a family member. These findings are not surprising given previous research showing high rates of ACEs among Indigenous adults in South Dakota (Warne et al., 2017) and nationally (Richards et al., 2021). The rates in the current paper are lower than in previous research because the current study asked about a relatively short six-month period, whereas rates in other studies ask about lifetime ACEs (Warne et al., 2017). Data underscore the urgency of initiatives needed to effectively prevent and respond to ACEs among children, including those most prevalent and highly related to inter-generational transmission of ACEs (Narayan et al., 2021). It is important to remember that ACEs among Indigenous relatives are rooted in experiences of colonization and ongoing systemic racism and classism, and therefore, macro-level/structural initiatives are sorely needed in addition to programs focusing on strengthening the *tiwahe* (family).

Regarding group differences based on ACEs, we found robust differences in depressive symptoms according to the number of ACEs, with children with higher ACEs in the past six months having higher depressive symptoms scores than those reporting no ACEs. This finding is consistent with previous research with non-Indigenous samples of children finding that ACEs are related to deleterious mental health outcomes, commonly depression (Elmore et al., 2020). This finding is also consistent with the stress process model, showing that external and relational events impact mental health (Aneshensel & Mitchell, 2014). Although future research is needed to unpack the temporal sequencing of these associations, efforts are needed to prevent ACEs and treat depression in ways that are culturally grounded. The prevention and treatment behavioral and mental health challenges (e.g., anger, depression, substance use) must address

**Table 2** T-tests comparing cultural connection among ACEs groups

ACE (Past 6 months)	No	Yes	<i>t</i>	<i>df</i>	<i>p</i>
	<i>M (SD)</i>	<i>M (SD)</i>			
Verbal abuse	2.13 (0.51)	2.09 (0.11)	0.35	167	0.725
Afraid of being hurt	2.11 (0.04)	2.23 (0.62)	-0.80	168	0.424
Physical abuse (pushing)	2.13 (0.51)	1.98 (0.71)	0.84	16.64 <sup>a</sup>	0.413
Physical abuse (hitting)	2.13 (0.51)	1.93 (0.73)	1.02	15.35 <sup>a</sup>	0.323
Sexual abuse (touching you)	–	–	–	–	–
Sexual abuse (touching adult)	–	–	–	–	–
Not enough to eat	2.11 (0.51)	2.17 (0.60)	-0.37	164	0.714
Adult couldn't care for you	2.12 (0.53)	2.07 (0.51)	0.36	20.11 <sup>a</sup>	0.724
Domestic violence (pushing)	2.12 (0.52)	2.34 (0.42)	-1.19	165	0.235
Domestic violence (kicking)	2.11 (0.54)	2.26 (0.51)	-0.81	170	0.420
Domestic violence (weapon)	–	–	–	–	–
Caregiver alcohol use	2.14 (0.52)	2.07 (0.52)	0.55	169	0.584
Caregiver drug use	2.12 (0.53)	2.13 (0.53)	-0.03	170	0.976
Caregiver depressive symptoms	2.12 (0.59)	2.15 (0.44)	-0.47	160.85 <sup>a</sup>	0.640
Caregiver anger	2.14 (0.58)	2.11 (0.41)	0.38	158.76 <sup>a</sup>	0.708
Caregiver anxiety	2.14 (0.55)	2.08 (0.53)	0.65	166	0.515
Caregiver suicidality	2.11 (0.54)	2.21 (0.38)	-0.61	166	0.540
Caregiver incarceration	2.14 (0.52)	2.04 (0.55)	1.03	167	0.307
Poverty	2.08 (0.56)	2.22 (0.37)	-1.59	58.93 <sup>a</sup>	0.116
Neighborhood violence	2.12 (0.55)	2.13 (0.47)	-0.08	166	0.936
Someone stole from family	2.13 (0.51)	2.10 (0.56)	0.29	167	0.776
Someone broke into home	–	–	–	–	–
Racism	2.10 (0.54)	2.35 (0.34)	-1.66	166	0.100
Caregiver death	2.09 (0.52)	2.15 (0.55)	-0.68	164	0.498
Caregiver divorce	2.13 (0.54)	2.11 (0.38)	0.16	162	0.876
Foster care	2.14 (0.49)	1.97 (1.01)	0.44	6.12 <sup>a</sup>	0.674
Visit from police or social worker	2.12 (0.55)	2.14 (0.48)	-0.33	166	0.744
Illness (hospital)	2.13 (0.52)	2.21 (0.38)	-0.50	167	0.620
Illness (worried I might not get better)	2.12 (0.50)	2.12 (0.58)	1.12	165	0.262

Note: ACE = adverse childhood experience

<sup>a</sup>Denotes where unequal variances were accounted for in analysis using Satterthwaite's degrees of freedom

the historical trauma response (Brave Heart, 2003) to aid in healing from historical grief.

While depressive symptoms were higher among children with recent ACEs, cultural connection was inversely related to ACEs. More specifically, the group that did not report any ACEs reported greater cultural connection compared to the 1–3 ACEs group. Given the current analysis was cross-sectional, directionality cannot be determined. It is possible that more traditional Lakota homes are less likely to be characterized by substance use, caregiver mental health problems, and so forth, leading to fewer ACEs experienced among children, because connection to culture is related to lower rates of substance use and mental health problems among Indigenous adults (Brave Heart, 1999). It is also possible that children who are experiencing a greater number of ACEs may feel disconnected from their Lakota culture. According to the Indigenist Ecological Systems Model (O'Keefe et al., 2021), intergenerational learning of traditional knowledge, values, and customs is key to the positive development of Indigenous children; such learning instills strengths unique to Indigenous families. Strengths-based

programming must be grounded in this history and traditional culture.

## Limitations

Despite the important information gleaned from this study, there are several limitations. First, data are cross-sectional and thus the temporal sequencing of associations is unknown. Second, measurement of cultural connection was limited. Cultural connection is a core tenant of one's being that includes but is not limited to spiritual, behavioral, attitudinal, and relational aspects. Measurement of cultural connection could be greatly expanded beyond the current work. For example, a review of measures of cultural factors among Indigenous populations found measures of seven major concepts: acculturation/enculturation, connectedness, communal mastery, ethnic identity, historical loss, participation in cultural activities, and religiosity/spirituality (Prevention Solutions, 2018). While we suggest future studies expand upon the measurement of cultural connection, we also acknowledge that it is impossible for a quantitative study to truly capture the richness and importance of

**Table 3** T-tests comparing depressive symptoms among ACEs groups

ACE (Past 6 months)	No	Yes	<i>t</i>	<i>df</i>	<i>p</i>
	<i>M (SD)</i>	<i>M (SD)</i>			
Verbal abuse	8.55 (4.48)	13.76 (4.79)	-5.61	161	<0.000
Afraid of being hurt	9.15(4.79)	13.31(5.25)	-2.98	162	0.003
Physical abuse (pushing)	9.37(4.83)	10.71(5.94)	-0.98	163	0.331
Physical abuse (hitting)	9.20(4.81)	12(6)	-2.04	160	0.043
Sexual abuse (touching you)	–	–	–	–	–
Sexual abuse (touching adult)	–	–	–	–	–
Not enough to eat	9.37(4.83)	11.5(5.92)	-1.52	160	0.130
Adult couldn't care for you	9.41(4.65)	10.31(6.55)	-0.54	16.72 <sup>a</sup>	0.599
Domestic violence (pushing)	9.28(4.93)	12.25(4.92)	-1.66	161	0.099
Domestic violence (kicking)	9.37(4.88)	11.38(5.37)	-1.13	165	0.261
Domestic violence (weapon)	–	–	–	–	–
Caregiver alcohol use	9.04(4.74)	12.84(5.12)	-3.26	164	0.001
Caregiver drug use	9.32(4.90)	12.5(4.75)	-1.79	164	0.075
Caregiver depressive symptoms	8.25(4.5)	11.33(5.08)	-4.05	161	<0.000
Caregiver anger	8.22(4.29)	11.2(5.23)	-3.93	159	<0.000
Caregiver anxiety	8.43(4.52)	11.5(5.00)	-4.02	161	<0.000
Caregiver suicidality	9.26(4.86)	11.8(4.54)	-1.60	161	0.110
Caregiver incarceration	8.92(5.03)	11.38(3.91)	-2.82	162	0.005
Poverty	9.40(4.89)	10.86(4.87)	-1.43	158	0.154
Neighborhood violence	8.84(4.98)	10.43(4.79)	-2.04	161	0.044
Someone stole from family	9.03(4.97)	10.61(4.64)	-1.96	162	0.052
Someone broke into home	–	–	–	–	–
Racism	9.13(4.83)	13.67(3.87)	-3.17	161	0.002
Caregiver death	9.22(4.93)	10.31(4.79)	-1.32	159	0.188
Caregiver divorce	8.86(4.51)	12.48(5.65)	-3.53	158	0.001
Foster care	9.34(4.98)	12(2.83)	-1.40	162	0.163
Visit from police or social worker	8.89(4.90)	11.77(4.19)	-2.80	161	0.006
Illness (hospital)	9.30(4.93)	11.89(4.26)	-1.54	163	0.125
Illness (worried I might not get better)	8.53(4.61)	12.21(4.81)	-4.44	160	<0.000

Note: ACE = adverse childhood experience

<sup>a</sup>Denotes where unequal variances were accounted for in analysis using Satterthwaite's degrees of freedom

**Table 4** ANOVA results comparing three ACEs groups on cultural connection and depressive symptoms

	No ACEs	1–3 ACEs	4 + ACEs	<i>F</i>	<i>df</i>	<i>p</i> value
	<i>n</i> = 32	<i>n</i> = 63	<i>n</i> = 76			
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>			
Cultural connection	2.32 (0.47) <sup>a</sup>	2.04 (0.56) <sup>a</sup>	2.11 (0.51)	3.23	2	0.042
Depressive symptoms	6.55 (5.16) <sup>ab</sup>	9.08 (4.12) <sup>a</sup>	11.03 (4.87) <sup>b</sup>	10.42	2	<0.000

Note: ACEs = adverse childhood experiences. Statistically significant pairwise differences ( $p < .05$ ) are marked with superscripts

one's connection to their culture or life ways. Third, a few improvements to the ACEs measurement may be warranted. For example, one item asks about a police officer or social worker visiting the home. We assumed children would interpret the social worker to be a Child Protective Services (CPS) representative, given historic mistrust between CPS and the Indigenous community (Sinha et al., 2022). However, other home visiting programs may be protective and address a number of concerns in the home with positive outcomes (Peacock et al., 2013). Another example is that any measure asking about the past six months only addresses certain times of year—in our case, primarily the summer. Fifth, the sample size was small and while all Indigenous, limited specifically to Indigenous children in one region,

most of whom identified as Lakota, which limits generalizability given the vast heterogeneity in Indigenous communities and cultures. Sixth, we had a rather narrow scope of correlates of ACEs, only examining cultural connection and depressive symptoms. Considering these limitations, future research is needed that is longitudinal and prospective and focuses on Indigenous children across various regions and tribal communities. Research is also needed to examine other correlates including additional protective factors (e.g., having important adults in one's life), as well as outcomes (e.g., PTSD; substance use) of ACEs. Future longitudinal research could also examine the reciprocal relationship between individuals and their environment, accounting for the cultural, social, and environmental context that is well



sued to explain the interaction between adverse childhood experiences, cultural connectedness, and depressive symptomatology.

## Conclusion

We found that over 80% of Indigenous children reported at least one ACE in the past six months, with the majority reporting multiple ACEs. Children with ACEs reported more depressive symptoms than did children without ACEs. Further, children who did not report any ACEs reported greater cultural connection than did children who reported 1–3 ACEs. These findings have important implications for programming and policy. First, policies and other initiatives that reduce poverty and systemic racism are urgently needed as these are inextricably linked to risk for and outcomes of ACEs among Indigenous children; without these root causes, disproportionately high rates of ACEs among Indigenous children would not exist (Waren., 2017). Second, these findings also underscore the urgent need for funding for culturally grounded prevention and intervention initiatives that not only focus on the Indigenous child but most importantly focus on the *tiwahe* (family). Programmatic efforts are needed to help rebuild aspects of the traditional Indigenous family (e.g., love, respect, honoring the sacredness of children) that are the antithesis to harsh parenting, child maltreatment/abuse, and that may serve to buffer against other types of non-familial ACEs (e.g., witnessing violence; experiencing racism). There is a growing emphasis in the field of prevention and intervention science that initiatives for Indigenous children and families must be culturally grounded to have far-reaching impacts. In addition to being family-based, initiatives can also occur in schools. Most of this work to date has focused on substance use/initiation (Snijder et al., 2020) and mental health/suicidality (Clifford et al., 2013), as opposed to ACEs prevention, although ACEs are a strong predictor of these health outcomes.

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## Declarations

**Conflict of Interest** On behalf of all authors, the corresponding author states that there is no conflict of interest.

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