Prevalence of Adverse Childhood Experiences and an Examination of Strengths-Based Attributes among American Indian and Alaska Native Communities

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Abstract: *Adverse childhood experiences (ACE) are one of the leading causes of health disparities and inequities in American Indian and Alaska Native (AI/AN) populations. The purpose of this survey study was to create and pilot a Tribal ACE (TACE) tool that recognizes the cultural and community factors that AI/AN populations face that contribute to ACEs. Using a two-phase, mixed-methods, culturally-centered approach, we created a two-part tool. The first part consisted of the updated ACE items, while the second part of the tool assessed individual strengths-based attributes that may serve as protective factors following personal adverse experiences. Using three Tribal Health Programs (THP) in California, we piloted this tool among 516 AI/AN adults. We assessed ACEs, healthy coping, social support, resilience, cultural and community connections, and participant demographics. Using the updated, 23-item TACE questionnaire, participants had a total experience score ranging from 0-22. Women, participants who identified as another race in addition to AI/AN, and those with secondary education reported more ACEs. Individual strengths-based attributes also revealed that older AI/AN participants and those who only identified as AI/AN (compared to those identifying with additional races) had higher scores in resilience, coping, and culture and community connectedness. These findings support using the TACE tool in AI/AN populations as a valid and reliable means to document ACEs, resilience, coping, and culture and community connectedness.*

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INTRODUCTION

Adverse childhood experiences (ACEs) are often measured using a validated tool assessing experiences of abuse prior to the age of 18. Research regarding these traumatic experiences (emotional, physical, and sexual abuse, parental substance use, mental illness, incarceration, and/or divorce) documents a clear link between ACEs and poor health behaviors and disease as an adult (Felitti et al., 1998). Exposure to adverse experiences in childhood has been associated with increases in risk factors for ischemic heart disease, cancers, chronic lung disease, and liver disease in adulthood (Felitti et al., 1998); repeated exposure to ACEs is associated with an even greater risk of these already poor health outcomes. Considering risk factors to ACEs, higher ACE scores are often associated with being female, identifying as a racial or ethnic minority, or sexual minority (Giano et al., 2021).

While there is research to support the relationship of ACEs and poor health outcomes, less is known about the link among American Indians and Alaska Natives (AI/AN). Significant findings within AI/AN samples with ACEs are often overlooked or grouped into larger racial categories to allow for comparisons to larger referent groups (Giano et al., 2021); these studies also tend to have smaller samples of AI/ANs and are often limited in geographical location. In the largest sample of AI/ANs to date, Giano and colleagues (2021) examined 3,984 AI/AN participants and found that the current body of literature on ACEs underestimates the prevalence of adverse experiences among AI/AN populations. Among studies specifically examining AI/AN populations, researchers have found that ACE scores are 2.32 times higher than those individuals who identify as White, AI/AN females report higher ACEs than AI/AN males (Giano et al., 2021), ACEs are related to high-risk behaviors in adults with alcohol dependence (Koss et al., 2003), and parental ACEs were related to their own child's social-emotional problems through their parent's reported mental distress (Wurster et al., 2020).

The currently validated tool that is used to examine ACEs among U.S. populations examines trauma in an individualistic manner and does not consider the culture or context of an individual (Giano et al., 2021). Historically, AI/AN people are at an increased risk to experience ACEs as a function of their collective social, economic, historical, and cultural trauma.(Giano et al., 2021). Health risk factors for AI/ANs are often associated with intergenerational experiences

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of trauma including (but not limited to) colonialism, racism, marginalization, mass relocation, and the abuses of the boarding school systems. One study found that among AI/ANs reporting higher rates of historical trauma (ancestral loss of land, language, culture), they also experienced higher rates of depression, substance use, and suicide (Brockie et al., 2015). As it currently stands, the ACEs tool does not account for Native culture or their intergenerational trauma in a way that allows the AI/AN experience to be fully seen and understood. Assessing ACEs in Tribal communities is difficult because limited validated tools have been developed with AI/AN populations in mind (Kelley, Piccione, et al., 2019). Experiencing these compounding structural and systemic factors places AI/ANs at greater risk for smoking, alcohol abuse, drug abuse, depression, suicide, and general health-related quality of life issues (Warne et al., 2017). In order to provide appropriate context to an AI/AN-specific ACEs tool, one must consider including additional community and systemic context—like exposure to community violence, economic hardship, bullying, or experience with foster care (SmithBattle et al., 2021).

Exploring ACEs inherently focuses on negative experiences, while failing to acknowledge the protective factors an individual exhibits in the face of adversity. While AI/AN populations have experienced significant historical and cultural trauma, AI/AN people are strong, resilient, connected to their communities and culture, and have a long history of traditions, language, beliefs, and ceremonies that help them overcome negative events that happen in their lives. In working with AI/AN communities, many public health outreach efforts have begun to utilize a strengths-based approach, incorporating understanding resilience in the face of trauma (Hamby et al., 2023). Within the AI/AN community, *resilience* is considered as "the distinct AI/AN worldviews, beliefs, values, and practices that support individual and community resistance and positive transformation" (Oré et al., 2016, p. 136). This concept can be considered an intergenerational process that hinges on the community connection of sharing values, beliefs, and practices as a means of promoting strength and healing (Oré et al., 2016). Research on resilience has found that sharing similar, difficult experiences can improve family bonds and build community connection (Burnette et al., 2020). Lack of family or community connection and experiences with isolation (assessed within ACEs) is related to negative health outcomes and higher mortality rates (Holt-Lunstad et al., 2015). Research suggests that AI/AN family and community connections provide an important source of strength in the face of adversity, which can be directly related to increases in family cohesion and positive mental and physical health outcomes (John-Henderson et al., 2023; Palimaru et al., 2022). Among AI/AN peoples, cultural and community connectedness can serve as a protective factor in reducing

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depression and anxiety among adults, as well as substance misuse, marijuana use, and alcohol use—especially among youth (John-Henderson et al., 2023; Kelley, Witzel, et al., 2019).

Experiences with ACEs and their subsequent negative health outcomes are also impacted by one's own coping skills. Involving the ability to regulate one's emotions to decrease the effects of a stressor, positive coping skills are often related to having a strong sense of community and social support and is often directly related to positive health outcomes (Kerai et al., n.d.; Wilson et al., 2024). Especially among non-White communities, it is suggested that community-based resilience and support enhances coping skills, encouraging individuals to interpret adversity as something that is manageable, indirectly enhancing psychological well-being. This may suggest that the association between race, ethnicity, and the sense of community and belonging can directly impact positive health outcomes.

While understanding ACEs within Tribal communities is imperative to prevention and intervention efforts, utilizing a strengths-based approach (and assessing concepts like resilience, coping, and community connection) provides a more holistic and tailored approach that can help providers understand the individual as more than just their experiences with trauma. To address the need for a culturally-sensitive ACE tool, the California Rural Indian Health Board, Inc. (CRIHB), California Tribal Epidemiology Center (CTEC) developed a "Tribal Adverse Childhood Experiences" (TACE) survey to explore ACEs, as well as strengths-based attributes of AI/ANs in the domains of resilience, coping, and connection. The goal of this study was to develop and pilot a reliable and culturally-tailored tool that can be used to assess ACEs among AI/AN populations. The primary objective was to create culturally-tailored ACE items and pilot their reliability among a California AI/AN sample. Secondary objectives included exploring these newly assessed ACEs and their association with strengths-based attributes of resilience, coping skills, and culture and community connection.

METHODS

Design and Setting

The creation of the TACE survey had a three-phase, mixed-method, culturally-centered approach that included drafting the tool, implementing the tool, and validating the results. With community involvement and review, the TACE tool was created in 2019 and subsequently

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administered to three Tribal health programs (THPs) representing the Northern, Central, and Southern regions of California. Sites were selected based on past responses to the Tribal Behavioral Risk Factor Survey ACE data. The TACE tool was implemented organization-wide between 2020 and 2021. This survey study was approved by the institutional review board of the CRIHB. The authors followed CRIHB's requirements and ensured the research was culturally sensitive and relevant to AI/AN communities participating.

Developing the TACE Tool with Community Members

The first step in creating the TACE tool was examining a combination of previous publications and tools used among AI/AN communities and selecting questions from these tools that were deemed meaningful and culturally responsive. Previous AI/AN tools included the initial tool measured in the CDC-Kaiser Permanente ACE Study (CDC, n.d.) the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), the Rosenberg Self-Esteem Scale (Rosenberg, 1965), the Circle of Courage and Positive Psychology Survey (Brendtro et al., 2005), the Brief Resilience Coping Scale (Sinclair & Wallston, 2004), the Cultural Connectedness Scale (Snowshoe et al., 2015), and the Cultural Resilience Scale (Kelley et al., 2018).

The study team met with AI/AN community members, THP staff, and tribal consultants to review the first draft of the TACE survey. This informal review process included in-person and virtual discussions around the need for a culturally balanced ACE tool. These individuals (N =10) were selected based on their Tribal affiliation and experience with administering ACEs within AI/AN communities. Over six months, the team met multiple times to finalize the TACE survey. Based on consensus from the expert panel, initial edits included removing questions that were not culturally sensitive and creating response options of "Don't Know" and "Prefer Not to Answer" for ACEs.

An example of revisions made include changes to demographic questions. Geographical location is essential to one's identity and wellbeing; as such, several questions on demographics were revised and edited. For example, the item "Are you AI/AN?" was revised. If the response was "No," people were asked if they had a family member who was AI/AN and what their relationship was with that person. AI/AN identity is recognized, but the role and importance of TACEs are not exclusionary; relatives and kinship systems are deeply embedded into histories and communities. Families are composed of varying Tribal affiliations, races, and ethnicities, not just AI/AN. Another revision was to the response options for adverse events. Questions regarding ACEs were revised from basic "yes" or "no" responses to the frequency of a given event.

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Community elders felt that understanding the frequency of adverse events (instead of a binary yes/no) would provide more information that could be used to understand the community experience and tailor interventions. For example, "*How often* did your parents or adults in your home ever slap, hit, kick, punch or beat each other up?" included response options of "more than once," "once," "never," "don't know/not sure," or "prefer not to answer."

Participants completing the TACE survey consisted of AI/AN Tribal community members, patients, and THP Providers; those over the age of 18 gave informed consent to participate. The authors relied on previous research and community involvement in the published research guidelines on how to modify tools and measures for diverse populations, with attention to language, culture, strengths, and resilience over deficits (Kelley, Piccione, et al., 2019; Stewart et al., 2012).

Measures

The final, culturally sensitive TACE survey consisted of 54 multiple-choice questions and one open-response text question. These questions were pulled from established measures based on consensus from the AI/AN community members, THP staff, and Tribal consultants. Questions explored ACEs, resilience, coping, cultural and community connections, and participant demographics. CTEC used previously validated questions and response scales when possible (see Appendix).

Demographic Characteristics

Ten questions were used to determine participants' self-reported race and ethnicity, age, gender identity, education level, employment status, and Tribal community affiliation.

Culturally-Tailored Tribal Adverse Childhood Experiences

The original ten items of the ACE tool (CDC, n.d.) were incorporated into the development of the culturally-tailored AI/AN Tribal ACEs questionnaire. Some original items were split into separate items ("Did you lose a parent through divorce, abandonment, death, or other reason" split into Divorce, Abandonment, and Death). An additional 13 culturally-tailored items were added to provide greater context and understanding of the AI/AN experience. Additional topics covered by these items included witnessing traumatic events, being treated poorly due to one's race or ethnicity, being bullied, and being in foster care. Response items included frequency options (*1 = Never; 2 = Once; 3 = A few times; 4 = Many times*), but for the purposes of this paper, endorsement

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of ACEs was coded dichotomously to indicate the presence or absence of exposure (Yes = 1/No = 0). Higher total scores indicated greater exposure to ACEs; alpha = .884.

Strengths-based Attributes

Resilience. Resilience was assessed using eight questions, rated on a 5-point Likert scale (*1 = Disagree, 5 = Agree*). Items were adapted from previous research, with measures focusing on social support, self-esteem, and meaning (Brendtro et al., 2005; Rosenberg, 1965; Zimet et al., 1988). Items included "I feel that I have many good qualities"; "I am motivated to work hard"; "My life has a purpose." Higher scores among participants were indicative of greater resilience in the face of adversity; alpha = .809.

Coping. Healthy coping was assessed using four questions adapted from previous research; measures focused on support, actions, and beliefs (Sinclair & Wallston, 2004). Items were rated on a 5-point Likert scale (*1 = Disagree, 5 = Agree*). Items included "I get emotional support from others"; "I take action to try to make the situation better"; "I turn to work or other activities to take my mind off things." Higher Coping scores were indicative of greater coping skills; alpha = .689.

Culture and Community Connectedness. This was assessed using 10 items adapted from the previous research (Kelley et al., 2018). All responses included a 5-point Likert scale with ratings of agreement or strength (*1 = Disagree to 5 = Agree; 1= Very Weak to 5 = Very Strong*). Measures focused on interest in finding out about AI/AN status, cultural knowledge and connections, language use, community attachment, and sense of community. Items included rating current and community connections related to cultural knowledge, Native language involvement, and sense of community and connections with others. Cronbach's alpha was .859.

Survey Administration

Three California THPs distributed the TACE tool to patients during routine healthcare visits or to community members as part of outreach prevention efforts. THPs used paper surveys, tablets embedded with the survey, and individual survey links via email using Qualtrics (an electronic survey platform). To be eligible for the survey, individuals were required to be over 18 at the time of the survey, provide written consent, and be active patients at a participating THP. Anyone under the age of 18 was excluded from the study. The survey was self-administered and took approximately 15 minutes to complete. To encourage participation and compensate individuals for their time, each respondent received a $25 gift card.

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Statistical Analyses

Descriptive statistics (means, standard deviations, frequencies) were used to summarize sample characteristics and study variables. Descriptive and multivariable analyses were conducted to examine the ACE scores of survey respondents. Group differences in scores (TACES, Strengths-based attributes: Resilience, Coping, Culture & Community Connectedness) were examined using parametric between-subjects analyses, including independent-samples *t* tests, and one-way ANOVA. Assumptions of normality, homogeneity of variance, and linearity were assessed prior to conducting analyses. Statistical significance was evaluated at an alpha level of .05.

Based on total TACE scores, a median split determined two groups: "low" (≤ 6) and "high" (≥7) experiences of TACEs. A logistic regression was conducted to examine predictors of membership to the high or low group using total scores of Strengths-Based Attribute subscales and relevant demographic variables. A random forest model was also conducted to examine individual item importance from the total subscales when predicting TACE grouping (high or low).

RESULTS

A total of 516 patients completed the TACE survey. The characteristics of respondents are listed in Table 1. Participants ranged in age from 18 to 88, most of whom were female (66%), high school graduates (52%), and employed at least part-time (61%). Nearly 95% of participants identified as American Indian/Alaska Native; 87% were AI/AN from California, and 25% identified with another race in addition to AI/AN.

Culturally-Tailored Tribal Adverse Childhood Experiences

Twenty-three items assessed culturally-tailored exposure to ACEs for AI/ANs. Because each item contributed either 0 (no exposure) or 1 (exposure), the total ACE score could range from 0 to 23. The median ACE score was seven, ranging from 0 to 21. This median was used to determine groupings into a "low" or "high" TACE experience group (henceforth referred to as 'group'). The top five ACEs reported in surveys included being treated badly or unfairly because of one's own race/ethnicity (64%); living with someone who has a problem drinking (58%); experienced parent/adult swearing, insults, or put downs (58%); seeing or hearing someone being beaten up, stabbed, or shot (56%); and being bullied by a peer or classmate (55%; Table 2).

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Table 1.
Characteristics of AI/AN TACE survey respondents, 2020-2021 (N = 516)

Participant Characteristics		N (%)
Age (N = 490)		
	18 to 24	62 (12.6)
	25 to 34	131 (26.8)
	35 to 44	114 (23.2)
	45 to 54	76 (15.2)
	55 and older	107 (21.4)
Gender		
	Female	342 (66.3)
	Male	163 (31.6)
	Two-Spirit	10 (1.9)
Education		
	Elementary	8 (1.6)
	Some high school	75 (14.5)
	High school graduate	266 (51.6)
	College graduate	93 (18.0)
	Other	74 (14.3)
Employment		
	Employed Full-Time	276 (53.5)
	Employed Part-Time	40 (7.8)
	Unemployed and currently looking for work	95 (18.4)
	Unable to work	50 (9.7)
	Retired	33 (6.4)
	Self-Employed	22 (4.3)
	Student	15 (2.9)
	Taking care of home and/or family	44 (8.5)
Hispanic		
	No	421 (81.6)
	Yes	91 (17.6)
Are you AI/AN?		
	No	25 (4.8)
	Yes	488 (94.6)
Are you California AI/AN?		
	No	67 (13.0)
	Yes	449 (87.0)
Do you identify with Another Race?		
	Not Applicable	44 (8.5)
	No, I identify only as AI/AN	299 (57.9)
	Yes, I also identify with other racial groups	130 (25.2)
Which is also your race?		
	Asian	6 (1.2)
	Black or African American	5 (1.0)
	Native Hawaiian or Pacific Islander	15 (2.9)
	Other	30 (5.8)
	White	81 (15.7)
How many people under 18 years old are living in your home?		
		Range = 0-8
		Median = 1.00

Note. California AI/AN included 17 California counties and over 30 California Tribes

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Table 2.
Most Frequently Endorsed Tribal ACEs (N = 516)

Now, looking back to before you were 18 years of age…	Yes	No	Missing
2w. Did you feel safe in the neighborhoods/communities you grew up in?	101 (21.2)	**375 (78.8)**	40
2p. How often did you feel that you were treated badly or unfairly because of your race or ethnicity?	**324 (64)**	182 (36)	10
2t. Did you feel people in your neighborhoods/communities looked out for each other, stood up for each other, and could be trusted?	151 (36.5)	**263 (63.5)**	102
2b. Did you live with anyone who has a problem with drinking?	**292 (58.2)**	210 (41.8)	14
2k. How often did a parent or adult in your home ever swear at you, insult you, or put you down?	**270 (57.9)**	196 (42.1)	50
2o. How often, if ever, did you see or hear someone being beaten up, stabbed, or shot in real life?	**278 (55.9)**	219 (44.1)	19
2q. How often were you bullied by a peer or classmate?	**279 (54.8)**	230 (45.2)	7
2c. Did you live with anyone who had a problem using drugs, including prescription drugs?	222 (46.1)	260 (53.9)	34
2i. How often did your parents or adults in your home ever hit, punch, beat, or threaten to harm each other?	202 (45.2)	245 (54.8)	69
2e. Did you lose a parent through separation or divorce?	219 (43.3)	287 (56.7)	10
2d. Did you live with anyone who served time or was sentenced to serve time in a prison, jail or other correctional facility?	212 (42.7)	284 (57.3)	20
2j. How often did a parent or adult in your home ever hit, beat, kick, or physically hurt YOU in any way?	195 (42)	269 (58)	52
2a. Did you live with anyone who was depressed, mentally ill, or attempted suicide?	171 (37.6)	284 (62.4)	61
2r. Did your family sometimes cut the size of meals or skip meals because there was not enough money in the budget for food?	168 (36.4)	294 (63.6)	54
2g. Did you lose a parent through death?	177 (34.7)	333 (65.3)	6
2h. Did you experience unwanted sexual contact (such as fondling or oral/anal/vaginal intercourse/penetration)?	146 (30)	341 (70)	29
2l. How often did anyone at least 5 years older than you (or an adult) ever touch you sexually?	138 (29.4)	332 (70.6)	46
2f. Did you lose a parent through abandonment?	138 (27.8)	358 (72.2)	20
2m. How often did anyone at least 5 years older than you (or an adult) try to make you touch them sexually?	125 (25.6)	364 (74.4)	27
2s. Did you feel that you didn't have enough to eat, had to wear dirty clothes, or had no one to protect or take care of you?	125 (25.5)	366 (74.5)	25
2v. Did you feel that no one in your life loved you or thought you were special?	101 (22)	359 (78)	56
2n. How often did anyone at least 5 years older than you (or an adults) force you to have sex?	91 (18.6)	398 (81.4)	27
2u. Were you ever in foster care?	72 (14.5)	423 (85.5)	21

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We examined differences in TACE scores across different demographic groups. Women (M = 9.20, SD = 5.11) had significantly higher TACE scores than men (M = 8.05, SD = 4.39), t (366.21) = -2.51, p = .009. There were no significant differences among age groupings and total TACE scores. There was a significant difference in TACE scores across different educational groups. TACE scores were the lowest for participants who completed elementary and some high school (M = 7.59, SD = 5.43), followed by participants who were high school graduates (M = 8.51, SD = 4.68), and then college graduates and above (M = 10.12, SD = 4.75), F (2, 513) = 9.25, p < .001. Post hoc Tukey tests revealed significant differences between college compared to high school graduates (p = .002), as well as college compared to elementary/some high school (p <.001). Participants were asked to report if they identified with another race in addition to being AI/AN (Not Applicable; "No, I identify only as AI/AN;" "Yes, I also identify with other racial groups"). Examining the participants who reported yes (n = 130) or no (n = 293-299), those who identified as being another race (M = 9.97, SD = 4.90) in addition to AI/AN had significantly higher TACE scores than those who did not identify with an additional race (M = 8.72, SD = 4.77), t (427) = -2.47, p = .014.

Strengths-based Attributes

Means and standard deviations are presented for each individual item of the strengths-based attributes subscales of Resilience, Coping, and Culture and Community Connectedness; Cronbach's alpha are also presented (Table 3).

There were no significant gender differences when examining the strengths-based attributes. There were no significant differences in these subscales among the three aforementioned educational groupings. Participants who also identified with another race in addition to being AI/AN (M = 34.88, SD = 5.31) reported significantly lower Resilience scores compared to participants not identifying with an additional race (M = 36.03, SD = 4.91), t (422) = 2.17, p = .03. Participants identifying with an additional race to AI/AN had significantly lower Culture scores (M = 33.70, SD = 6.82) than those identifying only as AI/AN (M = 36.77, SD = 7.27), t (425) = 4.09, p < .001. Additionally, among Coping total scores, there was a trend toward significance, with those identifying with an additional race to AI/AN having slightly lower scores (M = 17.01, SD = 2.96) than those only identifying as AI/AN (M = 17.54, SD = 2.77), t (420) = 1.76, p = .07.

There were significant differences in participants' ratings of strengths-based attributes for those over and under the age of 35. Among participants over 35 (M = 36.11, SD = 4.88), they had

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significantly higher Resilience scores than their younger counterparts (M = 34.76, SD = 5.50), t (372.92) = -2.75, p = .006. Older participants (M = 17.59, SD = 2.69) had significantly higher Coping scores than younger participants (M = 16.83, SD = 3.08), t (369.83) = -2.78, p = .003. Those over 35 (M = 36.45, SD = 7.84) also had significantly higher Culture and Community Connectedness scores than those under 35 (M = 34.66, SD = 7.33), t (485) = -2.53, p = .006.

Table 3.
Descriptives of Strengths-Based Attribute Subscales (N = 516)

Item	Mean (SD)
Resilience	Alpha = .809
1. I feel that I have many good qualities	4.65 (.69)
2. On the whole, I am satisfied with myself	4.33 (1.02)
3. I can talk about my problems with my family	4.30 (1.27)
4. There is a special person who is around when I am in need	4.37 (1.08)
5. I feel comfortable making friends and forming relationships with others	4.25 (1.16)
6. I am motivated to work hard	4.66 (.72)
7. I show respect and concern for others	4.84 (.48)
8. My life has a purpose	4.73 (.72)
Coping	Alpha = .689
9. I turn to work or other activities to take my mind off things.	4.39 (.97)
10. I get emotional support from others.	4.24 (1.01)
11. I take action to try to make the situation better.	4.56 (.75)
12. I try to find comfort in my religious, traditional, and/or spiritual beliefs.	4.31 (1.07)
Culture & Community	Alpha = .859
13. I am interested in learning more about my AI/AN culture.	4.71 (.69)
14. I am proud to be an AI/AN.	4.91 (.41)
15. I have participated in at least one of the following family/traditional activities…	4.71 (.85)
Please select the rating that best describes your **current connections** with the following	
16. My cultural knowledge and connections	3.61 (1.17)
17. My traditional native language involvement and usage	2.37 (1.30)
18. My sense of community and attachment to my community	3.35 (1.19)
19. My connections with people outside of my age group	3.70 (1.12)
Please select the rating that best describes your **community's connections** with the following	
20. Cultural knowledge and connections	3.33 (1.16)
21. Traditional native language involvement and usage	2.43 (1.25)
22. Sense of community	3.35 (1.11)

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Logistic Regression

A logistic regression was conducted to examine variables that best predicted belonging to the low or high TACE categorization (i.e., being in high TACE group = 1, where low TACE group = 0). Dependent variables included total scores of Resilience, Coping, Culture and Community Connectedness, as well as demographic variables of gender, age, education, and if participants identified with another race other than AI/AN. The overall model was significant, χ^2 (7) = 35.16, $p < .001$, explaining 11% of the data. As shown in Table 4, Resilience was a significant predictor of TACE group membership (B = -0.156, SE = 0.035, $p < .001$, OR = 0.856), indicating that higher resilience was associated with lower odds of being in the high TACE group. Specifically, each one-unit increase in resilience was associated with a 14.4% decrease in the odds of high TACE group membership. Coping was also a significant predictor (B = 0.124, SE = 0.054, $p = .023$, OR = 1.132), such that higher coping scores were associated with higher odds of being in the high TACE group. Each one-unit increase in coping was associated with a 13.2% increase in the odds of higher TACE group membership. Level of education significantly predicted TACE group membership (B = 0.375, SE = 0.159, $p = .018$, OR = 1.455), indicating that higher levels of education were associated with greater odds of being in the high TACE group. Specifically, each increase in education level corresponded to a 45.5% increase in the odds of higher TACE group membership.

Table 4.
Logistic Regression Predicting TACE Group Membership

	B	S.E.	Wald	df	Sig	OR	95% CI
Resilience Total	-0.16	0.04	19.31	1	<.001***	0.856	0.80, .92
Coping Total	0.12	0.05	5.20	1	0.023*	1.132	1.02, 1.26
C & CC Total	0.02	0.02	1.33	1	0.249	1.019	0.99, 1.05
Age	0.000	0.01	0.003	1	0.958	1.00	0.99, 1.01
Gender	0.25	0.22	1.29	1	0.255	1.29	0.93, 2.00
Level of Education	0.38	0.16	5.59	1	0.018*	1.455	1.07, 1.99
Another Race	0.34	0.19	3.36	1	0.067	1.41	0.98, 2.04

Note. C&CC = Culture & Community Connectedness; Another Race = participants identifying as another race in addition to AI/AN; OR = Odds Ratio; CI = Confidence Interval; *p < .05; **p< .01; ***p< .001

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As this study involved piloting both the TACE items and strengths-based attributes subscales, we further investigated the individual items of Resilience and Coping to examine if any individual items were especially predictive of TACE group membership. A random forest model was conducted and revealed that items assessing satisfaction with self (*B* = -.68), comfort forming relationships *(B* = -.53), life having a purpose (*B* = -.57), and talking with family about problems (*B* = -.22) were predictive of low TACE group membership. Items of having good qualities (*B* = .67), trying to find comfort in religion/spiritual beliefs (*B* = .17), and making connections outside of one's age group (*B* = .14) were predictive of high TACE group membership.

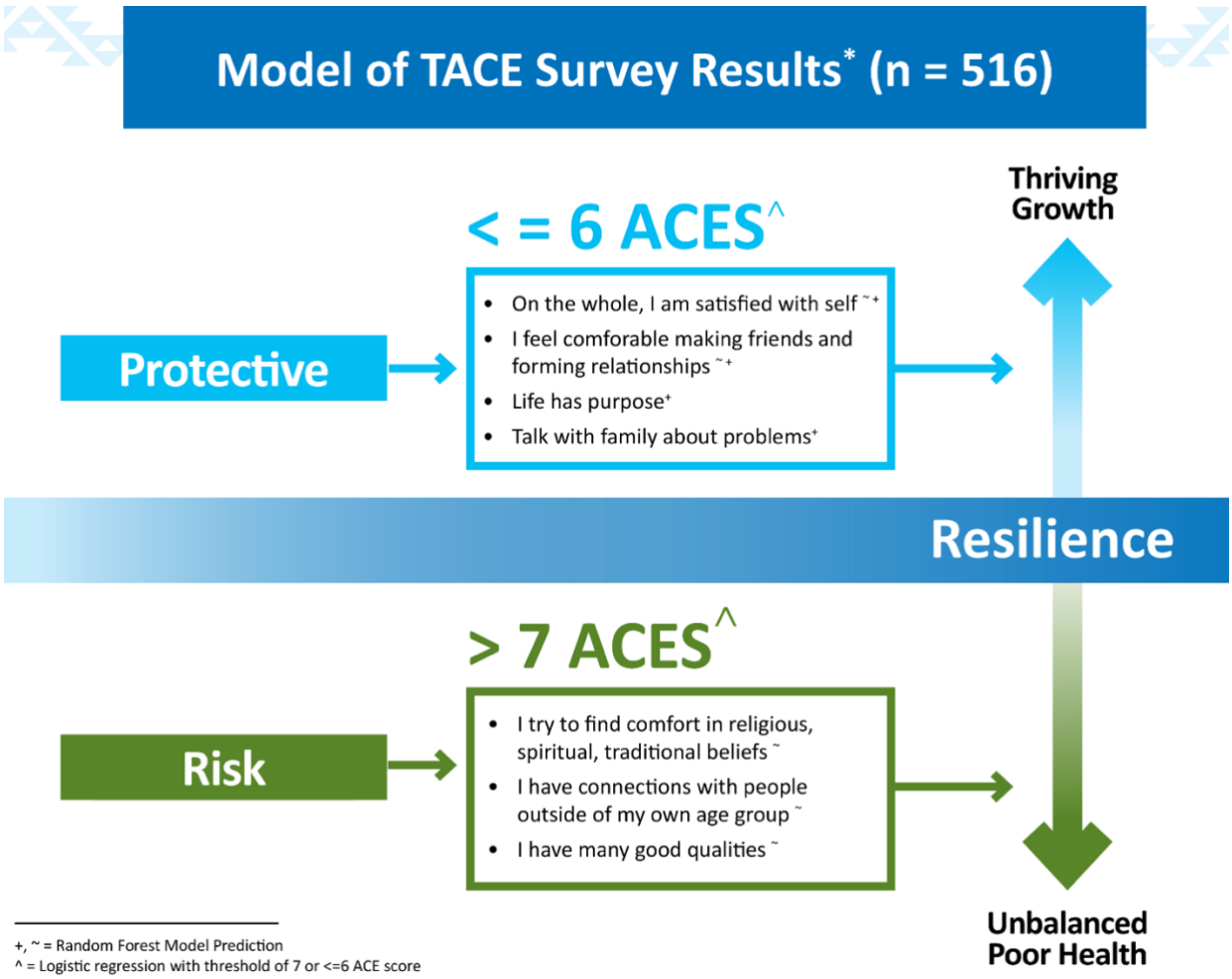


Figure 1. CRIHB TACE Scale Risk and Protective Factors

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DISCUSSION

This study provides the initial piloting of the updated Tribal Adverse Childhood Experiences (TACES) tool. The use of TACES with a large, California AI/AN sample provides support for the initial reliability and initial validity of using this tool with other AI/AN samples. The community-based participatory research process used to adapt the existing ACEs tool added to the content validity of survey questions and should be replicated in the future with other tribal communities (for the survey used, see Appendix) (Kelley et al., 2022). A significant limitation pointed out by previous research is that the ACEs tool has been used with AI/AN populations but is not culturally centered or framed in a cultural context relevant to AI/AN individuals and diverse cultural values and practices (Giano et al., 2021). We have shown that expanding the original ACEs tool has resulted in a number of additional adverse experiences had by AI/AN people. It was made clear that the AI/AN community within our sample have been significantly impacted by many of the childhood experiences listed in the updated version of the ACEs. Only 2% of the sample reported having had zero of the experiences listed in the updated TACEs list. This shows the need for an expansion of the original list, especially as it relates to the unique experiences of AI/AN individuals.

Examining the results of TACEs revealed significant gender differences, as well as differences among racial identification, and education level. Women, participants who identified as another race in addition to AI/AN, and those with secondary education reported having more ACEs. This is consistent with previous literature that suggests that women and members of other disenfranchised groups were likely to experience more adverse childhood events (Wurster et al., 2020). Future prevention efforts can be tailored through an intersectional lens and understanding that membership to multiple minority groups (gender minority, sexual orientation minority, additional racial groups) result in greater likelihood to have had extensive trauma histories, that will likely need to be addressed in medical or psychological care. Or, that trauma-informed providers need to be mindful of the complex trauma history that individuals who are members of multiple groups likely have.

As an initial exploration into the TACE data, we utilized a median split to examine groups of “high” and “low” TACE scores. This was done being mindful of how the tool might be used in Tribal communities (i.e., using categorizations in which scores could fall above or below a given threshold). We explored initial results and associations of these higher and lower TACE scores.

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Higher resilience scores were indicative of belonging to the lower TACE group. Resilience scores may be serving as a protective role, whereas those with higher resilience scores were less likely to experience adverse events, or classify them as adverse; this could also be a function of greater adaptive functioning and reduced vulnerability to adverse outcomes. In contrast, we found that higher levels of Coping were associated with membership to the higher TACE group. AI/AN individuals who have experienced high levels of ACEs may have developed and report stronger coping skills as a function of their personal experiences. This continues to make the case for exploring strengths-based attributes alongside ACEs, as many AI/AN individuals are experiencing factors that might serve as protective (or risk) to experiencing these events. Future prevention efforts may also consider educational efforts aimed at promoting resilience and coping skills as a means to protect against the effects of adverse experiences from childhood.

We also found that those belonging to the higher TACE group found comfort in their religious, spiritual, and traditional beliefs. This aligns with AI/AN concepts that healing from trauma requires growth that often comes with a connection to the Creator or a higher purpose (Kelley & BigFoot, 2024). Higher ACE scores were also associated with intergenerational connections. Individuals who have experienced higher levels of trauma likely seek the support of elders, aunties, and extended kinship systems beyond their age groups. One Tribal elder and clinical psychologist said, “This [support] is how people can get on the other side of healing.” Two statements were associated with lower ACE scores, self-satisfaction, and healthy relationships; both are anchors of a balanced and healthy life.

Participants’ scores on measures of Resilience and Coping remained relatively high (means closer to 5). However, among the items developed to assess Culture and Community Connectedness, there was a greater range of scores from participants. For example, mean scores for individual traditional Native language involvement and usage, and for community traditional Native language involvement and usage, were significantly lower than for all other items. Colonization, cultural erasure, boarding schools, land loss, premature deaths of elders, and mass genocide have been well documented as factors that contribute to the loss of Native language and usage (Smallwood et al., 2021). To encourage and improve cultural and community connection, future outreach efforts may want to continue emphasizing bringing back culture, instill values and traditions in our young people, and maintain the language and stories of our ancestors. Within these languages, there are sacred teachings and gifts that will heal our people. Other lower mean

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scores were also noted, particularly in cultural knowledge and connections, sense of community, and attachment to community. The loss of ancestral homelands and reservation/rancheria eras has taken much of the traditional family and community unit away. Many AI/ANs are forced to leave their Tribal communities in search of a better life, quality education and health care, and greater opportunities for their future (Walls & Whitbeck, 2012). While participants in this study are proud to be AI/AN and regularly participate in family and traditional activities, more opportunities are needed for them to learn their Native language, practice ceremonies, and engage with other AI/ANs as a community. These opportunities for cultural engagement and connection may also be fostered by Urban Indian Health areas where many AI/AN people reside (Allen et al., 2022; Herron & Venner, 2023; Kelley et al., 2018).

Strengths & Limitations

The study team acknowledges the strengths this study. First, the TACE survey had acceptable internal consistency and high Cronbach's alphas, suggesting that this tool is reliable and likely valid among similar samples. Second, the sample size was relatively large, which allowed for a rigorous analytical approach that is often difficult to achieve in many Tribal communities due to small populations and samples.

However, there are a few limitations that should be noted. Given the cross-sectional nature of the data, causal conclusions cannot be drawn, and future research should explore the mechanisms underlying this relationship. Social desirability may have occurred when examining the high scores among the Resilience and Coping subscales. In some cases, as many as 94% of participants agreed with individual items, suggesting a ceiling effect for some items. This could impact our ability to understand Resilience and Coping more deeply, since most participants agreed with each statement (and the subscale as a whole). While the purpose was to provide categorical cutoffs for prevention efforts, future studies can examine predictive ability of variables with TACES on a total score (and not a binary high/low group). Future studies will assess the factor structure of TACES and the strengths-based attributes subscales to determine if these items are adequate to continue using among samples of AI/ANs, if items need to be dropped or amended, and what domains are assessed within these new items. Last, although the sample size was relatively large, these individuals do not represent all AI/ANs, communities, or cultural perspectives of the 110 federally recognized Tribes in California or the 577+ Tribes in the United

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States. Future work should explore the use of the TACE tool in other communities to ensure that the experiences of AI/AN peoples are being fully captured with this newly validated tool.

CONCLUSION

This study aimed to establish the TACE survey's validity and reliability for use in Tribal communities. This is the first-ever, Tribal-specific tool used to measure ACEs while stressing the importance of culture and context in its assessment. We also presented the importance of balancing the assessment of ACEs with strengths-based attributes of resilience, community, and connections. The results presented here provide further evidence to explore the effects of Tribal ACEs on health and well-being. Through the updated TACE survey, providers, programs, and communities will be better equipped to develop and implement prevention and intervention strategies that address ACEs and build on community strengths. Use of the TACE tool can serve as a culturally-responsive, unifying framework to promote new trauma-informed care practices that heal and restore well-being in AI/AN populations.

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CONFLICT OF INTEREST

The authors declare no potential conflicts of interest.

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APPENDIX

TACE Survey

Tribal Adverse Childhood Experiences (ACEs) Survey

Survey Instructions: Please read each question carefully. Sections are separated by titles with a blue header. You may skip any questions you do not want to answer. The results from this survey will be kept confidential and are soley for the purpose of developing strategies, resources and trainings to address adverse childhood experiences in your community.

Section 1: Demographics

1a. Which best describes your gender identity?

- ○ Male
- ○ Female
- ○ Two-spirit
- ○ Other: (e.g., gender fluid, non-binary)

1b. What is your highest level of education?

- ○ Elementary
- ○ Some high school
- ○ High school graduate
- ○ College graduate
- ○ Other(specify): _____

1c. What is your current employment status?

- ○ Employed full time
- ○ Employed part time
- ○ Unemployed and currently looking for work
- ○ Student
- ○ Retired
- ○ Taking care of home and/or family
- ○ Self-employed
- ○ Unable to work

1d. What is your age? Specify: _____

If you are not 18 or older please stop and give the survey to the staff member onsite

1e. How many people under the age of 18 years currently live in your household?
Specify: _____

1f. Do you identify as Hispanic, Latino/a, or Spanish?

- ○ Yes
- ○ No

1g. Are you a California Indian?

- ○ Yes
- ○ No, *please see question 1i.*

1h. If you are California Indian, please list the tribe that you are most closely affiliated with. Specify:
_____

1i. Are you American Indian/Alaska Native?

- ○ Yes
- ○ No →

If no, do you have a family member who is American Indian/Alaska Native? If so, please list your relationship with this person: _____

1j. If yes, in addition to American Indian/Alaska Native, do you identify with other racial groups?

- ○ No, I identify only as American Indian/Alaska Native
- ○ Not Applicable
- ○ Yes, I also identify with other racial groups →

If yes, which one or more of the following would you say is also your race? (Select all that apply)

- ☐ White
- ☐ Black or African American
- ☐ Asian
- ☐ Pacific Islander

Other: (specify)_____

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Section 2: Adverse Childhood Experiences

This section asks about events that may have happened during your **childhood**. This section contains sensitive questions and some people may feel uncomfortable answering the questions.

As with the rest of the survey, you can skip any questions you do not want to answer. Afterward, if you would like to talk about any of these events with anyone, please see the resource list. It contains contact information on several organizations that can provide help.

Now, looking back to before you were 18 years of age…	Yes	No	Don't Know/Not sure	Prefer not to answer
2a. Did you live with anyone who was depressed, mentally ill, or attempted suicide?	○	○	○	○
2b. Did you live with anyone who had a problem with drinking?	○	○	○	○
2c. Did you live with anyone who had a problem using drugs, including prescription drugs?	○	○	○	○
2d. Did you live with anyone who served time or was sentenced to serve time in a prison, jail or other correctional facility?	○	○	○	○
2e. Did you lose a parent through separation or divorce?	○	○	○	○
2f. Did you lose a parent through abandonment?	○	○	○	○
2g. Did you lose a parent through death?	○	○	○	○
2h. Did you experience unwanted sexual contact (such as fondling or oral/anal/vaginal intercourse/penetration)?	○	○	○	○

How often did these events occur before the age of 18…	More than Once	Once	Never	Don't know/Not Sure	Prefer not to answer
2i. How often did your parents or adults in your home ever hit, punch, beat, or threaten to harm each other?	○	○	○	○	○
2j. How often did a parent or adult in your home ever hit, beat, kick, or physically hurt **you** in any way?	○	○	○	○	○
2k. How often did a parent or adult in your home ever swear at you, insult you, or put you down?	○	○	○	○	○
2l. How often did anyone at least 5 years older than you or an adult, ever touch you sexually?	○	○	○	○	○

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How often did these events occur before the age of 18…	Many times	A few times	Once	Never	Prefer not to answer
2m. How often did anyone at least 5 years older than you or an adult, try to make you touch them sexually?	○	○	○	○	○
2n. How often did anyone at least 5 years older than you or an adult, force you to have sex?	○	○	○	○	○
2o. How often if ever, did you see or hear someone being beaten up, stabbed or shot in real life?	○	○	○	○	○
2p. How often did you feel that you were treated badly or unfairly because of your race or ethnicity?	○	○	○	○	○
2q. How often were you bullied by a peer or classmate?	○	○	○	○	○

Now, looking back to before you were 18 years of age…	Yes	No	Don't know	Prefer not to answer
2r. Did your family sometimes cut the size of meals or skip meals because there was not enough money in the budget for food?	○	○	○	○
2s. Did you feel that you didn't have enough to eat, had to wear dirty clothes, or had no one to protect or take care of you?	○	○	○	○
2t. Did you feel people in your neighborhoods/communities looked out for each other, stood up for each other, and could be trusted?	○	○	○	○
2u. Were you ever in foster care?	○	○	○	○
2v. Did you feel that no one in your life loved you or thought you were special?	○	○	○	○
2w. Did you feel safe in the neighborhoods/ communities you grew up in?	○	○	○	○

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Section 3: Resilience

This section asks about your **current situation**. Please take some time to reflect and complete each item on the survey below. There are no wrong or right answers.

Please select how much you agree or disagree with the following statements:

	Agree	Somewhat Agree	Do not agree or disagree	Somewhat disagree	Disagree	Prefer not to answer
3a. I feel that I have many good qualities.	o	o	o	o	o	o
3b. On the whole, I am satisfied with myself.	o	o	o	o	o	o
3c. I can talk about my problems with my family.	o	o	o	o	o	o
3d. There is a special person who is around when I am in need.	o	o	o	o	o	o
3e. I feel comfortable making friends and forming relationships with others.	o	o	o	o	o	o
3f. I am motivated to work hard.	o	o	o	o	o	o
3g. I show respect and concern for others.	o	o	o	o	o	o
3h. My life has purpose.	o	o	o	o	o	o

Please select how much you agree or disagree with the following statements about **coping with stress**:

	Agree	Somewhat Agree	Do not agree or disagree	Somewhat Disagree	Disagree	Prefer not to answer
3i. I turn to work or other activities (such as walking, exercise, or gardening) to take my mind off things.	o	o	o	o	o	o
3j. I get emotional support from others.	o	o	o	o	o	o
3k. I take action to try to make the situation better.	o	o	o	o	o	o
3l. I try to find comfort in my religious, traditional and/or spiritual beliefs.	o	o	o	o	o	o

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Section 4: Culture & Community

The following set of questions ask about your **American Indian/Alaska Native culture** and **your community**. For question 4, the word "community" means a place where you live and share common characteristics or customs with other people nearby.

Please select how much you agree or disagree with the following statements:

	Agree	Somewhat Agree	Do not agree or disagree	Somewhat Disagree	Disagree	Prefer not to answer
4a. I am interested in learning more about my American Indian/Alaska Native culture.	o	o	o	o	o	o
4b. I am proud to be American Indian/Alaska Native.	o	o	o	o	o	o
4c. I have participated in at least one of the following family/traditional activities, including but not limited to: *Beading, Big Times, Pow Wows, hunting, hand or stick games, basket weaving, dancing, drumming, fishing, gathering traditional foods, and berry picking.*	o	o	o	o	o	o

Using the scale, please select the rating that best describes **your current connections** with the following:

About Me…	Very Strong	Strong	Average	Weak	Very Weak	Prefer not to answer
4d. My cultural knowledge and connections	o	o	o	o	o	o
4e. My traditional native language involvement and usage	o	o	o	o	o	o
4f. My sense of community and attachment to my community	O	O	O	O	O	O
4g. My connections with people outside of my own age group	o	o	o	o	o	o
About My Community…	**Very Strong**	**Strong**	**Average**	**Weak**	**Very Weak**	**Prefer not to answer**
4h. Cultural knowledge and connections	o	o	o	o	o	o
4i. Traditional native language involvement and usage	o	o	o	o	o	o
4j. Sense of community	O	O	O	O	O	O

Using the scale, please select the rating that best describes **your community's connections** with the following:

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5. Please provide any additional comments you would like to share:

End of Survey



********THANK YOU********

Behavioral Health Contact Information:
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