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# American Indian and Alaska Native Mental Health Research

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# ACQUIRED CAPABILITY FOR SUICIDE AMONG INDIVIDUALS WITH AMERICAN INDIAN/ALASKA NATIVE BACKGROUNDS WITHIN THE MILITARY

Bruno Chiurliza, BS, Matthew S. Michaels, BA/BS, and Thomas E. Joiner, PhD

*Abstract: The present study observes a military sample across race to better understand suicide risk among American Indian/Alaska Native (AI/AN) individuals utilizing the Interpersonal Theory of Suicide. In a sample of 3,387 Army recruiters, multivariate analysis of variance was used to compare the means across race on acquired capability and pain tolerance. AI/AN individuals demonstrated higher levels of acquired capability for suicide ( $p = .056$ ) and pain tolerance ( $p = .028$ ). These findings indicate that acquired capability and pain tolerance are key elements involved in suicide risk among AI/AN individuals within the military.*

Although the literature on suicide is growing constantly, the problem of suicide is still an alarming one. Rates are increasing yearly on a national and global level (Centers for Disease Control and Prevention [CDC], 2016; World Health Organization [WHO], 2014). According to the WHO (2014), the number of people lost to suicide globally over the course of a year is above 800,000. These numbers illustrate the threat of suicide for the general population; however, there are also groups of individuals at particularly increased risk. Two groups emphasized in the present study are military service members and American Indian/Alaska Native (AI/AN) populations.

## Increased Risk among Military Service Members and AI/AN Populations

The most recent suicide data from the Department of Defense (National Center for Telehealth and Technology & Defense Centers of Excellence for Psychological Health and TBI [T2 & DCoE], 2014) show that, for 2011, 2012, and 2013, the rates of suicide per 100,000 individuals in military active services, Reserves, and National Guard consistently ranged between 18.1 and 28.9. Data collected by the CDC (2016) illustrate that the national average rate

for those same years was lower than these figures from the military, ranging from 12.32 to 12.55 deaths per 100,000 individuals. In fact, this trend could be seen as early as 2008, when suicide epidemiological rates reported for the military (15.8 deaths per 100,000 individuals; T2 & DCoE, 2009) surpassed those reported for civilians (11.6 deaths per 100,000 individuals; CDC, 2016) and continued to rise after that time (Kang & Bullman, 2009; T2 & DCoE, 2010, 2013, 2014).

In addition to this comparison of military to civilian suicide rates, another concerning pattern has emerged when comparing suicide death rates and combat death rates in the military. The literature has shown that, from 2005 to the earlier half of 2012, the rates of suicide among soldiers in the Army remained elevated at 22 deaths per 100,000 soldiers, while the rates of death in combat decreased below that number (Hoge & Castro, 2012). These trends resulted in military suicide garnering national media attention from outlets such as Time and The Washington Post (Friedman, 2013; Londoño, 2013).

Despite the most recent numbers showing a decrease in overall military suicide rates from 2012 to 2013 across all active-duty military personnel—although rates still remain high, at 18.7 deaths per 100,000 service members (T2 & DCoE, 2014)—these same reports show that rates have increased for all National Guard and reserve members for that same time period, at 28.9 and 23.4 deaths per 100,000 service members, respectively. All of these rates illustrate that suicide in the military remains a concern, considering that the most recent national average is 13.41 deaths per 100,000 people (CDC, 2016).

AI/ANs represent another group that suffers from alarming suicide rates. According to the CDC (2016), in 2014 the second leading cause of fatalities among AI/ANs ages 15 to 44 years was suicide. The suicide rate among AI/ANs within this same age group was 17.59 deaths per 100,000, greater than the national average of deaths by suicide within this age range in 2014 (14.44 per 100,000) and greater than the suicide rate for any other racial/ethnic group within the same age range in 2014. Previous studies also have shown that AI/ANs exhibited higher rates than the U.S. general population in suicidal ideation, having a plan for suicide, and attempting suicide (Hyde, 2011). While the most recent data from the CDC (2016) demonstrate a slight decrease among AI/ANs in death rate per 100,000 individuals—from 11.69 in 2013 to 10.82 in 2014—AI/ANs still represent the minority racial/ethnic group with the highest rate of death by suicide per 100,000 individuals. It is critical for research to continue addressing the issue of suicide among AI/ANs in order to maintain this decrease.

## **Theoretical Foundations for the Present Study**

### **The Interpersonal Theory of Suicide and Relevance to Military and AI/AN Populations**

One approach for furthering our understanding of suicide in these two groups is the interpersonal theory of suicide (Joiner, 2005; Van Orden et al., 2010). The theory posits that individuals are at highest risk for suicide when three elements are present: thwarted belongingness (i.e., lack of meaningful interpersonal connections), perceived burdensomeness (i.e., an individual's belief that loved ones or society would be better off if he/she no longer lived), and acquired capability for suicide (i.e., a diminished fear of death and increased pain tolerance). The first two comprise the desire for suicide, and the latter is a separate but related element, the presence of which is not inherently problematic but becomes dangerous when combined with the first two. The theory proposes that acquired capability develops over time, as a consequence of painful and provocative experiences (Van Orden et al., 2010).

The interpersonal theory of suicide has been employed previously as a framework for observing suicide risk in military samples (Bryan, Clemans, & Hernandez, 2012; Bryan, Morrow, Anestis, & Joiner, 2010). Bryan and colleagues (2010) found that military service members demonstrated higher levels of acquired capability for suicide relative to a clinical non-military sample, and that the interaction between acquired capability and perceived burdensomeness predicted history of suicidal behavior. A more recent study (Bryan et al., 2012) found that perceived burdensomeness, acquired capability, and the interaction between the two were all positively associated with suicidality among service members. These studies partially support the theory as an appropriate approach for studying suicide risk within the military, and they illustrate that military personnel exhibit higher levels of acquired capability for suicide than civilians and that such elevations play an important role in conferring risk for suicidal behavior within military populations.

One key distinction about military populations regarding risk for suicide as determined using the interpersonal theory is that individuals in the military have access to and familiarity with using firearms, a highly lethal means. As described by Van Orden and colleagues (2010), this access and familiarity with firearms can be problematic because repeated and ongoing exposure to such highly lethal means can serve as a painful/provocative event, which in turn may facilitate elevated levels of acquired capability for suicide. Therefore, it is critical for researchers to expand our knowledge about acquired capability for suicide among military populations.

The interpersonal theory also was utilized previously for studying suicide risk in AI/AN samples. O'Keefe and colleagues (2014) found that, in a sample of AI/AN individuals representing various tribes, thwarted belongingness did not predict suicidality above and beyond other known covariates, while perceived burdensomeness did, along with the two-way interaction between both perceived burdensomeness and thwarted belongingness. This study was the first to investigate suicide risk among AI/AN individuals utilizing the interpersonal theory variables and generated evidence to support continued use of this framework.

### **Pain Research in Military and AI/AN Populations**

In a study investigating the psychometrics of the Acquired Capability for Suicide Scale (ACSS), Ribeiro and colleagues (2014) found that the construct of acquired capability includes both physical pain tolerance and fearlessness about death. Thus, it is important to reference the abundant pain literature focused on these two groups, because each may be unique in terms of pain tolerance (e.g., Barkwell, 2005; Beecher, 1946; Buchwald, Beals, & Manson, 2000; Dar, Ariely, & Frenk, 1995; Kramer, Harker, & Wong, 2002; Muñoz & Luckmann, 2005; Nademin et al., 2008; Palit et al., 2013).

Various studies in pain and military research have demonstrated that military service members tend to demonstrate unique responses to pain. One study provided evidence suggesting that wounded combatants exhibit a lower need for pain medication than civilians suffering from comparable wounds (Beecher, 1946). Dar, Ariely, and Frenk (1995) also illustrated that veterans who experienced more severe combat wounds display higher levels of pain threshold and tolerance compared to soldiers who experienced light combat wounds. More recent research has also suggested that military suicide decedents are more likely to have exhibited higher levels of physical pain tolerance, as well as tolerance for death- and pain-related experiences such as physical injury or viewing dead bodies (Nademin et al., 2008).

The AI/AN pain literature has demonstrated that AI/AN individuals are less likely to seek pharmacological treatment for severe pain symptoms, but more likely instead to seek their own traditional treatments (Buchwald et al., 2000), which tend to encourage tolerating more pain as a means of making the body stronger and protecting it (Barkwell, 2005). Additionally, pain research observing AI/AN samples suggests that AI/AN individuals may tend to tolerate pain until it becomes physically disabling instead of seeking pain relief (Muñoz & Luckmann, 2005), that AI/AN individuals may have a dampened response to pain relative to non-Hispanic White individuals (Palit et al., 2013), and that even the verbal descriptions of pain by AI/AN

individuals may differ from those of other racial/ethnic groups. For example, AI/ANs' descriptions may be characterized by a lack of importance given to details describing pain and by the infrequency with which pain is even acknowledged in many AI/AN cultures—as evidenced, for example, by consistent verbal self-report of mild pain symptoms in severe cases of inflammatory arthritis among AI/ANs observed by Kramer, Harker, and Wong (2002).

### **The Present Study**

Several studies support the use of the interpersonal theory in the context of military and AI/AN suicide. However, the present study seeks to emphasize further the role of acquired capability, and the pain tolerance element of acquired capability, in conferring risk for these two populations. Furthermore, the present study specifically seeks to investigate the role of acquired capability in differentiating AI/ANs from individuals of other racial/ethnic groups within a sample of Army recruiters. As suggested by the drastically varying rates of suicide across branches of the military previously discussed (T2 & DCoE, 2010, 2013, 2014), it is critical to study subgroups within the military individually, and Army recruiters are a considerably understudied group. Additionally, it is important to understand the functions of a mechanism involved in suicidal behavior, such as acquired capability, among this select group in order to develop effective methods to manage suicide risk when it is present despite the rigorous screening experienced by Army recruiters (U.S. Government Accountability Office, 2010).

In the present study, it is proposed that AI/AN individuals will demonstrate significantly higher levels of acquired capability for suicide than other racial/ethnic groups, and that AI/AN individuals also will score higher on the individual pain tolerance item used in the survey. Finding that AI/AN individuals in the military score differently on items of acquired capability and pain than do members of other racial/ethnic groups would illustrate the importance of pain tolerance in conferring suicide risk for this group, support the use of the interpersonal theory in future AI/AN and military suicide research, and potentially inform future AI/AN suicide research.

## METHODS

### Participants

The present sample consisted of 3,387 Army recruiters who were beginning recruitment school in Fort Jackson, South Carolina. Participants ranged in age from 20 to 57 years ( $M = 29.91$ ,  $SD = 5.11$ ), with 4 individuals (0.1%) declining to indicate their ages. Of the 3,387 participants in the sample, 3,097 (91.4%) were male, 273 (8.1%) were female, and 17 (0.5%) declined to indicate sex. The racial/ethnic composition of the sample was 65.4% ( $n = 2215$ ) non-Hispanic White, 14.8% ( $n = 501$ ) African American, 13.3% ( $n = 451$ ) Hispanic/Latino, 2.7% ( $n = 91$ ) Asian, 1.6% ( $n = 53$ ) Native Hawaiian/Pacific Islander, 1.1% ( $n = 37$ ) AI/AN, and 1.2% ( $n = 39$ ) other or declined to indicate race/ethnicity.

### Measures

Participants responded to demographic items (including an item indicating race/ethnicity) and an abbreviated, four-item version of the empirically supported Acquired Capability for Suicide Scale (ACSS; Van Orden, Witte, Gordon, Bender, & Joiner, 2008). This version was utilized due to the very specific sample of Army recruiters, time constraints, and the need to maintain a battery brief enough for participants to complete feasibly. These items were administered to participants during their orientation program at Fort Jackson, as part of a larger orientation survey. All individuals were administered the same items.

**The race/ethnicity item** was used as a predictor variable in the present analyses. The item prompted participants to indicate their race/ethnicity and was categorically rated from 0 to 6, with the seven possible options being AI/AN, Asian, African American, Hispanic/Latino, Hawaiian/Pacific Islander, non-Hispanic White, and other/decline to respond.

**The ACSS** (Van Orden et al., 2008) is a 20-item self-report measure. It is a Likert-type scale ranging from 0 (*not at all like me*) to 4 (*very much like me*). Ribeiro and colleagues (2014) demonstrated that the items on the scale measure two facets of acquired capability: fearlessness about death and pain tolerance. Due to the battery length constraints detailed above, the only item for pain tolerance was included, with three items that cover fearlessness about death. This abbreviated version of the ACSS has been utilized in previous research (Ribeiro et al., 2015), and the literature has demonstrated that both the full and abbreviated versions of the ACSS (e.g., Bender, Gordon, Bresin, & Joiner, 2011; Van Orden et al., 2008) have strong construct validity and internal consistency. In the present study, the abbreviated ACSS demonstrated adequate

reliability ( $\alpha = .77$ ). Item 1 was, “Things that scare most people do not scare me.” Item 2, the only pain tolerance item from the ACSS, was, “I can tolerate more pain than most people.” Item 3 was, “People describe me as fearless.” Item 4 was, “I am not afraid to die.”

## RESULTS

Multivariate analysis of variance (MANOVA) was conducted to compare means across the seven groups for race/ethnicity on a calculated canonical outcome variable comprised of scores on the 4 individual ACSS items. MANOVA was used in order to analyze differences at the item level and to increase the power of analyses. The multivariate omnibus test indicated significant differences on the canonical variable (Pillai’s Trace = .023;  $F = 3.283$ ;  $p < .001$ ;  $\eta^2 p = .006$ ). Contrasts were run to compare means on the canonical variable and at the individual item level. The two highest means on the total four-item ACSS score were those of the AI/AN group and the non-Hispanic White group (See Table 1). The multivariate results were marginally higher for the AI/AN group (Pillai’s Trace = .003;  $F = 2.31$ ;  $p = .056$ ;  $\eta^2 p = .003$ ) than for the non-Hispanic White group, providing support for our hypothesis that the AI/AN group would have higher levels of acquired capability than any other racial/ethnic group as assessed by these four items. Regarding the pain tolerance item, the highest mean was that of the AI/AN group, and the next highest was that of the non-Hispanic White group (See Table 1). The MANOVA contrast demonstrated that the AI/AN group scored statistically higher than did the non-Hispanic White group ( $F = 4.807$ ;  $p = .028$ ;  $\eta^2 p = .001$ ).

**Table 1**  
**Mean Values for ACSS Item 2 and ACSS Total by Ethnicity**

	Race/Ethnicity	Mean	Standard Deviation
<b>ACSS Item 2</b>	<b>American Indian/Alaska Native</b>	<b>3.05*</b>	.85
	Asian	2.46	1.07
	African American	2.41	1.06
	Hispanic/Latino	2.58	.98
	Native Hawaiian/Pacific Islander	2.47	.85
	<b>Non-Hispanic White</b>	<b>2.70*</b>	.96
	Other/Did not Disclose	2.37	1.00

continued on next page

**Table 1, Continued**  
**Mean Values for ACSS Item 2 and ACSS Total by Ethnicity**

	<b>Race/Ethnicity</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>ACSS Total</b>	<b>American Indian/ Alaska Native</b>	<b>10.51**</b>	3.28
	Asian	8.64	3.39
	African American	8.87	3.27
	Hispanic/Latino	9.38	3.32
	Native Hawaiian/Pacific Islander	9.25	2.91
	<b>Non-Hispanic White</b>	<b>9.76**</b>	3.19
	Other/Did not Disclose	8.71	3.15

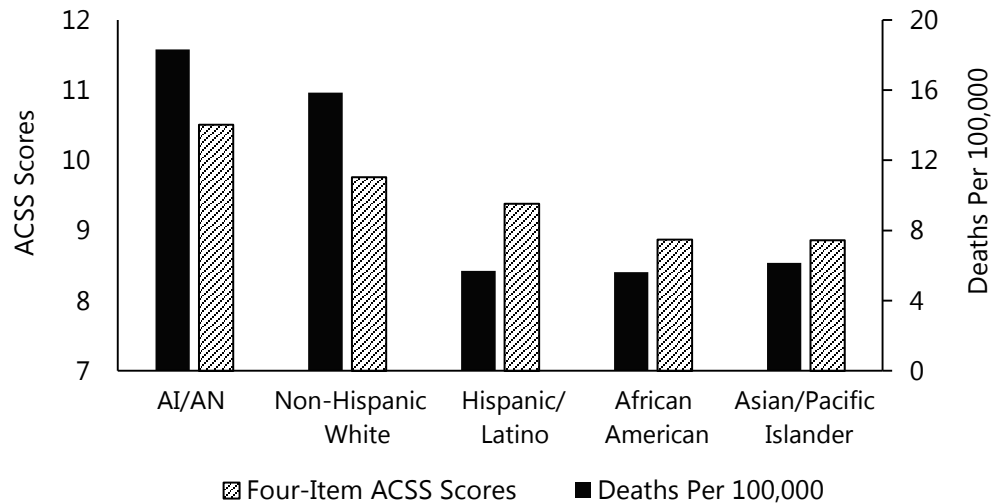
\* Marginally significant discrepancy ( $p = .056$ ); \*\* Significant discrepancy ( $p = .028$ )

## DISCUSSION

Building upon the extant literature on acquired capability and pain tolerance among both military and AI/AN populations, the present study sought to provide evidence demonstrating whether AI/AN individuals in the military exhibit significantly elevated levels of pain tolerance and acquired capability, and potentially to provide further support for the use of the interpersonal theory of suicide in military and AI/AN suicide research, while also informing future AI/AN research regarding the meaningful role of pain tolerance and acquired capability in AI/AN suicide risk. To the authors' knowledge, there are no empirical studies testing for AI/AN differences on acquired capability.

Using MANOVA, the present study compared total ACSS scores and pain tolerance scores across seven racial/ethnic groups (AI/AN, Asian, African American, Hispanic, non-Hispanic White, Hawaiian/Pacific Islander, and other/did not disclose). Findings indicated that AI/ANs demonstrated the highest levels of acquired capability and pain tolerance, and that, for both total abbreviated ACSS score and the pain tolerance item, the AI/AN group scored significantly higher than the next racial/ethnic group. Given these significant elevations, it is noteworthy that the pattern of differences in mean scores on the abbreviated ACSS by racial/ethnic groups resembles that of suicide rates by racial/ethnic group in 2013 (see Figure 1), indicating that acquired capability levels may be of great value in understanding cultural differences in suicide rates.

**Figure 1**  
**National Suicide Rates (2013) Compared to**  
**4-item ACSS Scores in the Present Study by Ethnicity**



Although the present study only allowed for a 4-item short-form measure of acquired capability, while much of the published research to date on the interpersonal theory of suicide utilizes a 7-item fearlessness about death version (Ribeiro et al., 2014) or the original 20-item version, this change did not impact the internal consistency of the items (Cronbach's  $\alpha = 0.76$ ). Additionally, the abbreviated ACSS utilized here contained items from both factors comprising the ACSS: pain tolerance and fearlessness about death (Ribeiro et al., 2014). Another difficulty in the present study was that the sample contained unequal cell sizes for the analyses, resulting in a significant test of equality of covariance matrices ( $p < .001$ ). However, the discrepancy in cell sizes is representative of discrepancies found in the general population (i.e., AI/AN individuals comprise 2.7% of our sample; AI/AN individuals similarly comprise 1.7% of the U.S. population [Humes, Jones, & Ramirez, 2011]). In addition, using Pillai's Trace in the context of MANOVA has been shown to be robust regardless of inequality of covariances (Finch & French, 2013). Further, while the present results may not be used to draw direct conclusions about any relationships between acquired capability and suicide risk in the groups observed, the evidence presented in this study provides a foundation to inform future studies focusing on cultural differences in suicide rates. Also, the sample included only Army recruiters, a particularly healthy subset within the military; consequently, results may not be representative of the entire population of U.S. military service members or of non-military civilians.

The present findings also suggest that future researchers should conduct a wider variety of analyses (e.g., dedicated sampling, predictive analyses with suicide-related outcome variables, mediator/moderator models utilizing the present constructs) to illustrate more clearly the role of acquired capability and/or pain tolerance in AI/AN suicide risk. These results suggest that future emphasis on acquired capability in AI/AN samples could contribute meaningful evidence for understanding the influence of this potential risk factor and its management, within the context of this particular group. One potential future direction would be to attempt to replicate these findings in a more generalizable (i.e., non-military) sample containing higher numbers of AI/AN individuals. Additionally, our findings imply that there may be an intersectionality effect for higher acquired capability among AI/AN service members, beyond the effects of membership in each group individually. As we could not test this question explicitly, future research studies could test this question directly by gathering dedicated samples from the following groups: 1) AI/AN individuals who have never served in the military, 2) AI/AN individuals who currently serve in the military, 3) non-AI/AN individuals who have never served in the military, and 4) non-AI/AN individuals who currently serve in the military. Such an approach would allow for examination of any potential interaction effects of membership in these high-risk groups.

As previously discussed, the rates of suicide within the military vary substantially across subgroups (T2 & DCoE, 2010, 2013, 2014). Therefore, it is crucial for future research to investigate the role of acquired capability for suicide across understudied and/or at-risk subgroups (e.g., recruiters, Reserves, National Guard) individually. Similarly, research on the role of acquired capability in military settings should not only further extend to veterans, a group known to be at risk for suicide (e.g., Guerra & Calhoun, 2011; Ilgen et al., 2012), but should also investigate these subgroups among veterans individually (e.g., veteran recruiters, Reserve or National Guard veterans), as there may be parallels to their active-duty counterparts, which could be greatly informative.

The present study attempted to use a novel approach to understand the high rates of suicidal behavior among a specialized population: service members who identify as AI/AN. The interpersonal theory of suicide (Joiner, 2005; Van Orden et al., 2010) has broad applications for understanding suicidal behavior and was the approach used in the present study. In the case of this specialized population, we know that acquired capability and/or pain tolerance is present at elevated levels in both AI/ANs and in military service members. Our observation of a sample having a combined identity as both AI/AN individuals and service members in the U.S. military indicates a potentially increased risk for suicidal behavior, specifically due to significantly higher

levels of acquired capability for suicide if an individual is in the military and of AI/AN background, as compared to all other racial/ethnic groups in the military. While the interpersonal theory (Joiner, 2005; Van Orden et al., 2010) states that the most dangerous levels of suicide risk are conferred by the combination of elevated desire and elevated levels of acquired capability, the results of the present study help elucidate the importance of emphasizing pain tolerance and acquired capability in future research aimed at understanding suicide risk among AI/AN individuals in the military, as well as potentially outside of the military. These findings also may inform future studies aimed at investigating avenues for managing that risk.

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# **IDENTIFYING SEXUAL HEALTH PROTECTIVE FACTORS AMONG NORTHERN PLAINS AMERICAN INDIAN YOUTH: AN ECOLOGICAL APPROACH UTILIZING MULTIPLE PERSPECTIVES**

Emily R. Griese, PhD, DenYelle Baete Kenyon, PhD, and Tracey R. McMahon, MS

*Abstract: This study examined aspects of the sociocultural context in which American Indian (AI) teen pregnancy occurs, focusing specifically on protective factors for Northern Plains AI youth. Principles of community-based participatory research guided the qualitative data collection from 185 community members (focus groups with AI youth, youth parents, and elders; interviews with health care providers and school personnel) from a reservation and an urban community. Results indicated three protective systems impacted the sexual health and behaviors of AI youth: school, family, and enculturation. These findings provide a better understanding of how specific protective factors within these systems may buffer AI youth from involvement in risky sexual behaviors and work to inform culturally relevant prevention and intervention efforts.*

## **INTRODUCTION**

Adolescence is an important developmental period often associated with exploration and experimentation through which youth test their boundaries within society (Reio, 2010; Steinberg, 2008). While risky behaviors in adolescence are common, spanning across race and socioeconomic status, disparities in the prevalence and impact of risky behaviors are evident. Teen pregnancy rates, directly determined by engagement in risky sexual behaviors among teens (Centers for Disease Control and Prevention, 2015), have been consistently more robust among minority groups in the U.S. (Hamilton, Marin, Osterman, Curtin, & Mathews, 2015). After steadily declining from 1991 to 2005, teen pregnancy rates saw an increase from 2005 to 2007. During this time period, American Indian/Alaska Native (AI/AN) youth sustained the largest increase in teen pregnancy rates (12%; see Hamilton, Martin, & Ventura, 2009, p. 2), more than twice that of the national increase. Although rates have since fallen, findings continue to suggest

disparities among AI/AN youth, such that, in 2012, birth rates for AI/AN youth were 34.9 per 1,000 live births, while national rates reached a historic low of 29.4, with non-Hispanic White teens even lower at 20.5 (Martin, Hamilton, Osterman, Curtin, & Mathew, 2013). Given these trends, researchers have often focused on the risk factors associated with the sexual health and behaviors of AI/AN youth.

Findings point to several potential risk factors likely associated with teen pregnancy and risky sexual behaviors among AI/AN youth, including increased rates of poverty (Misra, Goggins, Matte, & Lewis, 2014), substance use (de Ravello, Jones, Tulloch, Taylor, & Doshi, 2014), physical/sexual abuse (Rutman, Taulii, Ned, & Tetrick, 2012), and barriers to accessing health resources (Richards & Mousseau, 2012). It is evident, however, that the context surrounding AI/AN sexual health and behaviors is increasingly more complex. Prior research suggests that, for many female AI/AN adolescents, getting pregnant and having a child may provide an escape from stressful home environments and feelings of limited opportunities for higher education, extracurricular activities, and stable employment (Hanson, McMahon, Griesse, & Kenyon, 2014). In addition, teen pregnancy is often normative in lower socioeconomic areas, which may relate to feelings and/or the reality that there are fewer opportunities for viewed success among many of these youth besides parenthood (Mollborn, 2010). Taken together, it is evident that, for many AI/AN youth, the various contextual factors within their daily lives may compound the potential for risky sexual behaviors. An important step within the research surrounding AI/AN teen pregnancy, therefore, is to understand better the numerous contextual factors impacting the sexual health and behaviors of this population.

## THEORETICAL OVERVIEW

### Bioecological Model

The bioecological model provides an important framework for studying adolescent development, suggesting that developmental processes occur within a particular context of environmental systems with which an individual has continued interaction over an extended period (Bronfenbrenner, 1995, 1999): 1) the microsystem—the individual and his or her interactions within the immediate setting (e.g., home, school, community), 2) the mesosystem—those situations or events in which two or more microsystems interact in some respect (e.g., home-school interactions), 3) the exosystem—the social system which connects microsystems to

the larger social context, but with which the individual does not directly interact (e.g., parent's work environment), and 4) the macrosystem—the larger social context within which the individual develops (e.g., cultural values, customs, laws).

Given the encompassing nature of the bioecological model, it has been used to frame the various risk factors surrounding adolescent sexual health and behavior. For example, in a nationally representative study which applied the model, findings revealed that, after controlling for other demographic factors, daughters of teen mothers were 66% more likely to become teen mothers themselves (Meade, Kershaw, & Ickovics, 2008). This increased risk for teen pregnancy was attributed to microsystem factors of deviant peer norms and low parental monitoring, as well as macrosystem factors of poverty and being Hispanic. Though the bioecological model has been used as a framework to examine the risk surrounding adolescent sexual health and behavior, to our knowledge, it has not been applied to AI sexual health and behavior, specifically in identifying potential protective factors present for these youth.

### **Protective Factors for AI Youth**

Given the myriad risk factors unique to AI/AN youth (e.g., historical trauma, political disenfranchisement, and microaggressions; Grandbois, 2005), a goal of effective, culturally specific programming should be to identify protective factors that are indigenous to these youth. For example, findings across samples of youth suggest that positive parent-child relationships and parent connectedness are associated with lower participation in risky behaviors, including early sexual debut and teen pregnancy. For AI youth, in particular, this finding may extend to the larger family structure, especially among reservation-based youth who may be more likely than their urban counterparts to have large family networks, including the immediate and extended family, proximally available and potentially able to serve as a protective factor (LaFromboise & Dizon, 2003). Research identifying effective sexual health interventions for AI/AN youth has further suggested the importance of integrating trusted family members into prevention efforts as a way to align with the strong collectivist nature of AI/AN families and communities (Garwick, Rhodes, Peterson-Hickey, & Hellerstedt, 2008).

LaFromboise and colleagues (2006) identified various protective factors present for Northern Plains AI youth, including maternal warmth and perceived support from one's community. Unique to these youth, who were found to be highly integrated into mainstream culture, was the finding that level of enculturation—measured by participation in traditional activities, identification with AI culture, and traditional spiritual involvement—was the strongest

predictor of their resilience. This finding echoes prior research suggesting that engagement in cultural practices and internalization of cultural values can assist to develop strengths in AI youth (e.g., interdependence, courage) and can further serve as a protective factor (Whitbeck et al., 2001). To date, only a handful of studies have worked to identify the protective factors present in the lives of Northern Plains AI youth, and even fewer have examined the potential impact of such factors on the sexual health and behaviors of these youth. As such, the current study works to address the gap in the literature by identifying protective factors present in the sexual health and behaviors of Northern Plains AI youth.

### **PRESENT STUDY**

In the few studies examining protective factors present in AI sexual health and behavior, weaknesses have included utilizing only survey-based (e.g., Chewning et al., 2001) and/or single-informant data collection methods (e.g., Chewning et al., 2001; Garwick et al., 2008). Even more, one of the difficulties in studying AI populations is the heterogeneity of cultures. Findings regarding AI youth sexual health and behavior may differ based on the region, language, and cultural group with which they are affiliated (Whitbeck, Hoyt, Stubben, & LaFromboise, 2001). For the current study, the sample included youth from the Northern Plains region. Youth in this region face unique, myriad risks, including 3 times the rates of adverse life events compared to other youth nationally, and have a life expectancy at birth of only 64.8 years, 11 years less than the national average (U.S. Department of Health and Human Services, Indian Health Service, 2008). Specific to their sexual health and behaviors, Northern Plains AI youth have the highest teen birth rates of any Indian Health Service area, with rates among older AI youth (ages 18-19 years) significantly on the rise (Winego et al., 2012). Given the unique risks present for youth in this region, working to identify potential protective factors present in their sexual health and behaviors appears necessary.

The current study is part of larger efforts to inform a culturally specific positive youth development curriculum for Northern Plains AI youth. The goal of the present study, specifically, is to answer the following research question: What protective factors are present in the sexual health and behaviors of Northern Plains AI youth? We employed community-based participatory research (CBPR; similar to tribal participatory research, or TPR) methods through the use of focus groups and interviews to provide rich, qualitative findings. Research suggests that, to be successful when working with AI participants and communities, it is necessary to

employ research methodologies that recognize AI tribes as unique politically and culturally diverse ethnic groups. This approach has been cited as having higher participation rates and a higher likelihood of producing lasting change within AI communities (Fisher & Ball, 2003; Stubben, 2001). Thus, applying a CBPR approach was vital for the current study given the focus on a population and an area of research that have often been overlooked for AI youth, applying a CBPR approach was vital. The various CBPR methods used in the current study are described in detail below.

We approached the study goal utilizing various sources and methods to better triangulate any protective factors that were relevant and present across contexts impacting these youth. The bioecological framework guided our identification of informants from the various systems present in the lives of Northern Plains AI youth. Specifically, our study employed focus groups with community youth (both those who were and were not parents), and elders, as well as semi-structured interviews with health care providers and school personnel. To our knowledge, this theoretical and methodological model has not been applied when examining a strength-based approach to examining the sexual health and behaviors of Northern Plains AI youth. Therefore, the current study expands the literature by using the bioecological theory when examining the responses drawn from multiple informants regarding protective factors present in the sexual health and behaviors of Northern Plains AI youth.

## METHODOLOGY

### Participants and Procedure

Qualitative data were gathered from multiple informants, including Northern Plains AI youth (parents and non-parents), AI elders, health care providers, and high school personnel, with hopes of capturing participants' unique points of view and experience in their own words. The specific community partners involved in this study were selected as a result of ongoing, long-term relationships and the collective prioritization and shared commitment to examining and bettering the sexual health and behaviors of these youth. Data collected were part of a larger study meant to inform a culturally relevant, positive youth development curriculum for Northern Plains AI youth. Data collection occurred at one rural reservation site where almost all participants indicated one tribal affiliation, and at one small urban site (population less than 150,000 persons) with participants who indicated various tribal affiliations. The two sites are located relatively near each other (160 miles) and share a similar cultural heritage. The county

that comprises most of the reservation site has a racial/ethnic breakdown consisting of primarily White (60.5%) and AI (35.8%), with 20% of its population below the poverty level. Teen pregnancy rates for AI youth in this county are 90.9 per 1,000 (vs. 17.2 for White youth). The county where the urban site is located has a racial/ethnic breakdown of primarily White (88.6%) and AI (4.6%), with 11% of its population below the poverty level. Teen pregnancy rates for AI youth in this county are 109 per 1,000 (vs. 19.8 for White youth). The reservation site participants were relatively assimilated, with prior research indicating they reflected similarly on the sexual health and behaviors of their youth as did the urban site participants (Hanson, McMahon, Griesse, & Kenyon, 2014; McMahon, Hanson, Griesse, & Kenyon, 2015). The two different sites were included to provide an additional source of data triangulation. As such, we were able to identify protective factors present across both sites, further supporting the positive youth development curriculum directed toward youth at each site. Data collection began in fall 2012 and continued through winter and spring 2013.

Youth parents and non-parents were targeted for recruitment given their direct experience in relation to risky sexual behaviors and pressures faced by youth in these communities. They also were integral to the application of results in the development of culturally specific programming specific to the needs and context of this population. Elders also were selected for participation in this study given that, traditionally, elders are accorded a place of significant importance, honor, and respect among Northern Plains AI tribes (Kehoe, 1982). Lastly, personnel at health care service facilities and schools with a high representation of AI patients and students, respectively, within both communities were recruited due to their familiarity with this population. Each of these perspectives supported the exploration of the bioecological systems impacting the sexual health and behaviors of Northern Plains AI youth. Participants were recruited from both tribal and public schools at the reservation site, and from public schools at the urban site. All of the public schools included had some culturally specific programming available for all AI students.

As previously mentioned, the CBPR/TPR approach was used in the development of this project. Based on the extensive CBPR research of Israel and colleagues (2008), this study utilized the following principles: recognizing the community as a unit of identity; identifying and building upon the strengths and resources within the community; facilitating a collaborative, equitable partnership in all phases of the research; working toward the mutual benefit of all partners; disseminating results to all partners and involving them in the dissemination process;

and making a long-term commitment to sustainability. Moreover, our research aligned with the TPR approach (Fisher & Ball, 2003; Sahota, 2010) which prioritizes the needs of tribal partners and actively involves the tribe in ongoing regulation of the research process.

CBPR/TPR was also implemented in this study through the use of community advisory boards formed at both sites. These boards consisted of AI individuals of various ages, genders, and backgrounds and were consulted in developing data collection instruments (i.e., focus group and interview questions), implementing project protocols, establishing appropriate incentives, and identifying target populations for the study. This project was further developed with direction from the communities who indicated the need for identifying information on the sexual health and behaviors of their youth. The second author had worked with both communities for 3 years at the time of data collection and continues to do so. Specifically, during her earlier work on a Photovoice project with the reservation site, the theme of teen pregnancy was consistently raised. Even more, investment in teen health comes up consistently in conversations with tribal partners from both the reservation and urban sites, making this project a natural transition from our prior findings and discussions.

Our research team engaged in various local presentations (e.g., to the human services board) to provide updates and information throughout the data collection process. Since then, results continue to be disseminated to the community and tribe via local presentations, and we are currently implementing a culturally specific positive youth development curriculum with youth at both sites.

Prior to conducting this study, all study procedures were approved by the Sanford Research and Indian Health Service Aberdeen Area IRBs, and by the local tribe through a tribal resolution for the reservation site (Fisher & Ball, 2003; Sahota, 2010). Following CBPR/TPR and Institutional Review Board (IRB) guidelines, the specific tribal community is not identified in this study.

Local residents from each site were hired as research associates to assist in recruitment efforts and data collection, given their familiarity with the local population and culture. Participant recruitment was conducted similarly at both sites by means of flyers, community contacts, and word of mouth. For the interviews, key informants were identified by community contacts at each site. Eligibility criteria for participants in the focus groups included self-identification as AI and age (youth parents and non-parents were 16-24 years old; elders were 50 years old or older). Informants were not required to identify as AI, but were required to work

directly with AI patients or students. Although many of the interviewees (50%) self-identified as White, they were able to provide relevant information regarding the protective factors present in the lives of the AI youth with whom they worked. The low representation of AI school personnel and health care providers in this study is reflective of the general underrepresentation of AI education and health professionals at the national level (U.S. Department of Education, 2013; Xierali, Castillo-Page, Conrad, & Nivet, 2014).

The focus groups and key informant interviews had similar questions. The questions were the result of collaborative efforts among study staff and the communities involved. Table 1 includes the questions that were used for the present study focused on protective factors present in the sexual health and behaviors of AI youth.

**Table 1**  
**Study Questions**

Method	Questions (specific to the present study)
<u>Focus Groups</u>	
Elders (ages 50 years or older; self-identified as AI)	<p>Now we'd like to hear your opinions about how youth in the American Indian community make decisions about sex:</p> <ol style="list-style-type: none"> <li>1. What do you think are some reasons youth decide <u>not</u> to have sex?</li> <li>2. What do you think are some reasons youth decide to use contraception (condoms, pill, etc.) to prevent pregnancy?</li> <li>3. What do you think the community's role is, if any, in preventing teen pregnancy?</li> </ol>
Youth (ages 16-24 years; self-identified as AI; parents and non-parents)	<p>Now we'd like to hear about how youth in the Native community make decisions about sex:</p> <ol style="list-style-type: none"> <li>1. What do you think are some reasons your friends or people your age decide <u>not</u> to have sex?</li> <li>2. What do you think are some reasons youth decide to use contraception (condoms, pill, etc.) to prevent pregnancy?</li> <li>3. What reaction do youth your age have toward teen pregnancy?</li> </ol>
<u>Semi-structured Interviews</u>	
School Personnel	<ol style="list-style-type: none"> <li>1. What ways do you work with Native American teen <u>parents</u>?</li> <li>2. What reasons do you feel influence Native American youth to decide to <u>delay</u> parenting until after their teenage years?</li> <li>3. What do you think are some reasons Native American youth decide to use (condoms, pill, etc.) to prevent pregnancy?</li> </ol>
Health Care Provider	<ol style="list-style-type: none"> <li>1. What ways do you work with Native American teen parents?</li> <li>2. What do you think are some reasons Native American youth decide to <u>delay</u> parenting until after their teenage years?</li> <li>3. What do you think are some reasons Native American youth decide to use contraception (condoms, pill, etc.) to prevent pregnancy?</li> </ol>

Measures for both focus groups and key informant interviews referenced cultural influences, social norms, access to reproductive services, risky sexual behaviors of adolescents, and contraceptive use. However, focus group questions included additional measures of youth needs for transitioning to adulthood, community attitudes toward teen pregnancy, media influences on sexual decision making, and recommendations for content, incentives, and locations for the positive youth development curriculum. Interviewees were also asked about the various ways they work with AI patients and students, as well as how the various factors influencing sexual health and behaviors differ for AI youth versus other youth with whom they work.

For the broader study, data collection included 20 semi-structured interviews (10 per site, 5 with health care providers and 5 with school personnel per site) and 24 focus groups (12 focus groups per site). See Table 2 for a breakdown of age, gender, and race. Focus groups included 5 to 11 participants per group; groups were stratified by age, gender, and parental status. Youth parents were invited into separate focus groups from youth non-parents. Overall, 185 community members participated in this study, 90 from the reservation site and 95 from the urban site. However, two female parents from the reservation site who participated in the focus group did not complete the demographics survey and are not included in Table 2. Written consent or assent was obtained from all participants, and parental consent was obtained for participants younger than 18 years of age. Participants were offered a \$40 gift card to a retail store as an incentive for their participation in the focus group or interview. The interviews and focus groups were facilitated by the local community research associates hired for this project, were conducted in private rooms at local community health service buildings or at libraries at each site, and were tape recorded and then transcribed verbatim.

**Table 2**  
**Demographic Characteristics of Study Sample (N = 183)**

Method	Age <sup>a</sup>		Gender <sup>b</sup>		Race <sup>c</sup>		
	<i>n</i>	mean ( <i>SD</i> , range)	Female <i>n</i> (%)	Male <i>n</i> (%)	AI/AN (alone) <i>n</i> (%)	AI/AN (multiple) <i>n</i> (%)	White (alone) <i>n</i> (%)
<b>Focus Groups (N = 24)</b>	<b>163</b>	<b>33.5 (3.72, 15-79)</b>	<b>91 (55.8)</b>	<b>71 (43.6)</b>	<b>135 (82.8)</b>	<b>24 (14.7)</b>	<b>2 (1.2)</b>
Youth (non-parents)	48	18.7 (2.13, 15-24)	26 (54.2)	22 (45.8)	36 (75.0)	9 (18.8)	2 (4.2)
Youth (parents) <sup>d</sup>	57	21.8 (2.22, 17-25)	34 (59.6)	22 (38.6)	44 (77.2)	13 (22.8)	0
Elders	58	58.5 (6.81, 44-79)	31 (53.4)	27 (46.6)	55 (94.8)	2 (3.5)	0

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**Table 2**  
**Demographic Characteristics of Study Sample (N = 183)**

Method	Age <sup>a</sup>		Gender <sup>b</sup>		Race <sup>c</sup>		
	<i>n</i>	mean ( <i>SD</i> , range)	Female <i>n</i> (%)	Male <i>n</i> (%)	AI/AN (alone) <i>n</i> (%)	AI/AN (multiple) <i>n</i> (%)	White (alone) <i>n</i> (%)
<b>Interviews (N = 20)</b>	<b>20</b>	<b>48.4 (11.35, 28-69)</b>	<b>19 (95.0)</b>	<b>1 (5.0)</b>	<b>9 (45.0)</b>	<b>0</b>	<b>10 (50.0)</b>
School Personnel	10	47.5 (15.04, 28-69)	9 (90.0)	1 (10.0)	5 (50.0)	0	4 (40.0)
Health Care Provider	10	49.3 (7.67, 31-59)	10 (100.0)	0	4 (40.0)	0	6 (60.0)

<sup>a</sup> Three participants from the elder focus group did not report their age. <sup>b</sup> One participant from the youth parent focus group identified as both male and female. <sup>c</sup> One participant from the youth focus group did not report race. One participant from the elder focus group identified as Hispanic only. One school personnel did not report race. <sup>d</sup> Two female parents did not complete the demographics survey.

## Data Analysis

Transcripts were stored and analyzed using the QSR NVivo 10 software program. NVivo was used to operationalize codes, update and revise the evolving codebook, and create an electronic database of the transcripts that had been coded using the consensus codebook. Strategies set forth by Fernald and Duclos (2005) were followed by holding in-depth discussion and negotiation of the coding structure as it evolved throughout the preliminary analyses of the transcripts. The inductive content analysis was used to uncover overall themes by reading all transcripts, making notes on initial impressions, and letting the codes emerge directly from the text.

Interrater reliability was used to ensure consistency in agreement of the codes. Two independent coders, a PhD and a masters-level (third author), examined specific sections of text independently and then met to review codes and discuss discrepancies. Any inconsistencies were reviewed by the coders and the principal investigator (second author), problems with code definitions and/or coder errors were identified and discussed, and the codebook was modified as needed. All previously coded text was reviewed after this process and, if necessary, recoded to remain consistent with revised definitions.

To calculate Cohen's kappa for interrater reliability, two coders separately coded a random selection of 300 lines from the final transcripts using the final draft of the codebook (procedure recommended by Lombard, Snyder-Duch, & Bracken, 2004). The resulting value was 0.62, which is considered "substantial" (0.61 to 0.80) when interpreted using the previously defined benchmarks (Landis & Koch, 1977). Additional validity and reliability were established through various methods. For example, ontological appropriateness and contingent validity were

strengthened through the use of a diverse range of participant perspectives to describe the reality of teen pregnancy among AI youth (Healy & Perry, 2000). Descriptive validity was strengthened through the use of verbatim responses and investigator triangulation, obtained by cross-checking coding schemes to ensure that the investigators agreed upon the categorization of the data. Interpretive validity, which refers to the accuracy with which the researchers portrayed the meaning attached to the data as perceived by the participants, was also strengthened through the use of verbatim responses, in that little was left to interpretation other than the creation of categories in which the verbatim responses were coded. The results and discussion relate closely to the actual written responses of the participants and would, therefore, be deemed as having strong theoretical validity.

### **Data Analysis Specific to the Present Study**

In alignment with the goals of the current study, results reported here focus only on the protective factor themes that emerged in the data, although both risk and protective responses were detailed in participant responses. By using *protective factors* as a section criterion, coding categories examined further were the “decision making” and “environment” codes. Next, using the selection criteria of responses focused only on *sexual health protective factors*, the “don’t have sex” subcategory within the decision-making category was examined, along with the school, peer, culture, religion/spirituality, morality, and family subcategories within the environment category. Once responses that focused only on sexual health protective factors were identified, the first author and principal investigator (second author) agreed upon the overarching themes and subthemes that best reflected the similarities and recurrences of the final responses.

## **RESULTS**

No statistical analyses were performed to determine differences (e.g., chi-square) given the small subset of data focusing specifically on protective factors examined for this study. Throughout the results, however, we do highlight differences by informant and location. The most common protective factors for AI youths’ sexual health and behaviors were reflected in three major themes: family, school, and enculturation. Within two of these themes, subthemes were also present.

## Family

The family was an important overarching protective system indicated by four of the five sources (elders, non-parent youth, youth parents, and school personnel), most consistently by the elders at the reservation site. Most of the responses signifying the family as a protective factor alluded to the type of parenting, in particular, as well as to the level of warmth (including responsiveness and communication) and appropriate discipline (discipline accompanied by reasoning and discussion).

### Warmth

Several respondents indicated that an important protective function of the family system is having someone the youth feels comfortable communicating with and who will provide him/her with support and encouragement to make healthy sexual decisions. For example, a school staff member indicated that communication with the family was an important factor in teens using contraception, stating, "...if there's open communication and there's confidence, they're getting confidence built into them, and they're gonna have a lot more courage to make those decisions, make the right choices." This sentiment was echoed by a male elder: "Parents showing them that they really care and encourage them to do the right thing, or what makes them feel comfortable, I think."

Several responses suggested the importance of parents as positive roles models and sources of support, highlighted by a female non-parent youth:

I feel like that [having parents as positive examples] is huge because, if they didn't really have parents in their life—especially for guys—if they don't have that relationship with their father, they may not feel like that's a huge deal if they have a kid.

There also was reference to individuals in one's larger family structure, as detailed by a female elder who suggested that talking with one's "aunties" was an important protective factor for teens to decide not to have sex. She noted, "I told her [daughter] to go talk with her aunties about becoming an adult or teenager. And I had a lot of open communication with her, talking to her about different things, possibilities and stuff like that." This sentiment was echoed further by another female elder who suggested, "...my grandchildren, they're very open with me, you know, and they can't talk to their mothers, but they can talk to me."

From the current study findings, it is clear that open communication and support from both one's immediate family and the larger family structure can help instill a feeling of pride and confidence to make healthy sexual decisions.

### **Discipline**

Another important protective factor at the family level was the use of discipline. Respondents indicated it was important that youth have a “healthy fear” of or respect for their parents that stemmed from knowing that there were consequences for their behaviors. For example, a female elder responded:

They have to have that healthy sense of fear from their parents. They have to know there's going to be a consequence. Because, if they think nothing's going to happen, then anything goes, I guess. And I've never, well, she said I spanked her one time, but I don't remember spanking her. But you don't have to do it, physically. I mean, I just think they have to know there are consequences.

It is evident that youth need to understand the reasoning behind and consequences of the boundaries that are set for them. In doing so, respondents felt there would be a positive impact on the sexual health and behaviors of AI youth.

Some reflected on the parenting they received, alluding to a sense of responsibility toward their family. This idea was reflected by a female youth parent:

That's kind of how my family was, and, well, my parents lived with me, like, when I was a younger teen. You know, I never had the want to have sex, or I never really wanted to do it, because it was just like going behind their back, because I knew I'd tell them about it anyway.

Youth who have family members who can provide a reason for not engaging in risky sexual behaviors by explaining the consequences of these behaviors and enforcing family rules appear less likely to engage or want to engage in risky sexual behaviors. Given these findings, it is evident that an important protective function of the family is positive discipline, demonstrating that there are boundaries while simultaneously communicating and enforcing the consequences of stepping outside those boundaries.

## School

All types of informants from both sites believed activities and relationships formed within the school context were significant protective factors in the sexual health and behaviors of AI youth. School personnel identified this factor most consistently, followed by elders and youth parents. Subthemes identified were sexual health content, extracurricular activities, social support, and educational goals.

### Sexual Health Content

Addressing sexual health and behaviors in school through appropriate education was seen as an important protective factor. This belief was illustrated by responses suggesting the school system should support, rather than fight, sexual education. For example, a health care provider stated:

Role modeling, education, allowing sex education in the schools is very important... I think they [schools] should be supportive of, you know, the rules or the laws, whatever it is that allows sexual education, and to be more open-minded about allowing it.

Further, it was suggested that sexual education should not be limited to simply talking about sex and STD/STIs. Rather, as indicated by several participants, sexual education should include opportunities to interact with positive role models and to engage in activities that could heighten self-esteem and feelings of empowerment, thus energizing youth to make healthy sexual decisions. Attention also was given to the idea that early sexual education, even before middle school, was an important protective factor for later sexual health decision making. For example, an elder male responded to the question, “What do you think are some reasons youth decide not to have sex?” by stating:

I think the education system is a key part, especially for the girls in the school, young girls. I think they should be told a lot younger than 12 or 13 about it. Instill it in them to, hey, you don’t have to do this to be with somebody, or make yourself look good, or popular, or what. That’s why I think it’s a key part, to me, what they teach in the school.

### Extracurricular Activities

Another important protective factor within the school system was engagement in extracurricular activities (specifically sports), which provide youth with a sense of belonging. For example, a school staff member explained:

...you kinda see just the general sports programs that kids get involved in, and I think that's huge. And I think keeping kids active and giving them something to do with their time is—I guess that's another thing, kind of, you know, with just that prevention piece—is keeping kids active so they're not having nothing to do and searching for things that they maybe shouldn't be involved in, you know... You don't see as many kids, when they're involved in sports, end up pregnant when they, you know, worked, you know, all the way through high school. It just doesn't happen as often 'cause they have something that they're committed to. They're committed to their teammates, their coaches, their schools, and it gives them something to work towards and to feel, you know, excited about and proud. That's huge.

Extracurricular activities may further serve as a protective factor because they encourage youth to take responsibility in their commitment to a larger team. One female non-parent youth suggested this factor in her response when asked why youth decide to delay having sex:

I think that, umm, like the kids in sports, they are going to be, like, more focused on getting better and, like, doing more stuff. And, like, I think they know, like, the responsibility. Like, if you do have sex, it can make you, like, especially for girls—the ones who want to play basketball and stuff—like, when they get pregnant, they can't play while they are pregnant. So, it kinda makes them want to be safe, so they can continue playing.

Several participants believed that being part of school-based activities (primarily sports related) would make students feel as if they belonged to something that demanded their responsibility to themselves as well as the school, team, and/or coach, which could provide a feeling of attachment and connection within the school system and further serve as an important protective factor in the sexual health and behaviors of AI youth.

### **Social Support**

Another important protective factor indicated at the school level was social support, including support from school personnel, teachers, and peers. One way this support likely occurs is through open communication about sex and reproductive health. Some respondents felt having a close peer to consult with regarding sexual health decision making was vital. For example, a female elder reported, “I realized that it's good to have a best friend who would talk to them, tell them what's bothering them, you know?” Other respondents felt that a positive relationship with

a teacher or other adult within the school context was an important protective factor—maybe even more so than peer relationships—as suggested by the following response from a school staff member:

So, I think those positive adult relationships not only are obviously super important before they get pregnant, but also during and after, you know? Letting them know where condoms are at, or where to get birth control, or knowing that they can wait even. And that's, that's what's going to influence them, I think, even more than pop culture or their friends, is a positive adult relationship.

Others felt that teachers have an obligation to provide guidance and support in the sexual health and behaviors of youth. A school staff member reported:

I think teachers have a great influence and a great moral responsibility and ethical responsibility to make sure that the youth in their charge are prepared, not just with academics, but with living skills. What's the use of those academics if you're just going to be stuck at home with a kid the rest of your life?

### **Educational Goals**

The pursuit of educational goals was also a common protective factor reported by AI youth. For example, in response to the question regarding why some AI youth decide to delay parenting, a health care provider suggested "...maybe make [graduating from high school] more of a thing of pride for the youth, something they can feel a lot of honor or respect for..." Having a sense of pride about their education may make youth more likely to set educational goals and less likely to engage in risky sexual behaviors that can deter from these goals. This feeling was echoed by a female youth parent:

I think more people set their sights on higher education, you know? That they're starting to set their goal, and they know that they were already realizing, if you have a kid, you are kind of gonna have that road block for a while. As opposed to, you know, if you want to go to college, get a degree, and start a job, you know, when, when will be the right time to have a kid? You will have at least a focus about it.

## Enculturation

Three of the five sources from both sites indicated that engagement in cultural activities and spiritual traditions, or enculturation, was an important protective factor in the sexual health and behaviors of AI youth. These responses were most consistently indicated by elders and youth parents, followed by non-parent youth.

Cultural traditions, including visiting sacred sites, were viewed as an important part of teaching AI youth about their cultural values and spirituality, a strength that can be drawn upon in difficult situations. This feeling was reflected in a response from a female elder:

And so the next year, that next summer, we put her on Bear Butte [a sacred site for Northern Plains AIs], because we wanted her to have some kind of spirituality, foundation to help her. Because we knew that as she got into teenage years, there was going to be a struggle, you know? It was, and I think that's what helped her, you know, and helped her to become stronger, you know?

Elders and those surrounding AI youth recognize the difficult decisions teens face. Respondents indicated that providing youth with ways to connect to their ancestors and better understand the values and spiritual strengths within their culture would empower them to face the difficulties that lie ahead of them, including those associated with sexual health and behaviors. A female non-parent youth indicated:

...I know a lot of kids and see around my culture that there's kids that, like, you know, they do Sun Dances and they do a lot of traditional things, but they're also involved in, like, a lot of negative things. Which I don't think you can really do both, 'cause it's, like, our culture is really, like, about positive..., and you're not supposed to have no bad things involved with it. It's like, whenever you see them, like, doing that [Sun Dances], you can tell, like, they have a passion for it and love it.

These findings highlight the evident struggle for some AI youth who experience and understand the protective function their cultural traditions can serve, and yet see other youth who are simply going through the motions and continuing to engage in risky behaviors. For these youth, exposure to cultural traditions may not be enough to protect against risky behavior; rather, further education and guidance in their cultural traditions and values may provide the protection needed to deter them from engaging in risky behaviors.

## DISCUSSION

Given the evident disparities in the outcomes associated with risky sexual behaviors among AI youth (e.g., teen pregnancy rates), studies to date have focused primarily on deficit-based sexual health and behavior models. These models often overlook potential sources of resilience and strength that may be present. In working to address this limitation, the current study utilized a strength-based approach to identify sexual health protective factors for AI youth. This study's CBPR/TPR approach included community members in all stages of the research process and guided the collection of rich data regarding the dynamic systems and related processes associated with the sexual health and behaviors of AI youth. Findings from the current study illustrate the presence of three important contextual systems—family, school, and enculturation—that protect against poor sexual health outcomes and further inform prevention efforts specific to Northern Plains AI youth.

### Family

Multiple informants (youth parents and non-parents, elders, and school personnel) indicated the family was an important microsystem protective factor. Specifically, the parenting dimensions of warmth (through communication and modeling) and positive discipline (through respect and responsibility) were mentioned. These findings align with the larger research field examining the protective function of the family for risky behaviors—particularly with parenting style research suggesting the protective function of both warmth and positive discipline (characteristics of authoritative parenting; Maccoby & Martin, 1983). To date, however, the majority of these studies have focused on European American adolescents. The current findings add to the extant literature by suggesting the potentially positive impact of authoritative parenting in the sexual health and behaviors of AI youth.

While responses came from multiple informants, elders from the reservation site were the most consistent in indicating the family as a protective factor. Elders living on the reservation are likely to identify protective factors that align with traditional parenting values in AI culture, including values that encourage positive behaviors through parental warmth and responsiveness (BigFoot & Funderburk, 2010). Previous findings also suggest that reservation-based elders are more likely to be aware of, and see the positive impact of, the role the extended family plays in raising children (Coleman, Unau, & Mayfingers, 2001). Elder responses in the warmth subtheme mentioned “aunties” and “grandparents” as sexual health and behavior protective factors. These

findings extend beyond the Westernized terminology of parents and reinforce the importance of kinship within Native cultures. Further, given that reservation youth often live nearer family and tribal members, they may receive a higher level of support from and feel more connected to family members than do their urban counterparts (LaFromboise & Dizon, 2003).

## School

Respondents from both sites and all sources indicated that various aspects within the school system were important protective factors for the sexual health and behaviors of AI youth. While prior research findings suggest that a sense of belonging to one's school is often predictive of safer sexual behaviors (Chewning et al., 2001) and diminishes the likelihood of giving in to negative peer pressure (Dickens, Dieterich, & Beauvais, 2012). The use of qualitative methods in the current study allowed for the identification of unique mesosystem dimensions interacting within the school system (e.g., family-school, culture-school) that contribute to its overall protective function.

Participants reported that sexual education within the school system was important. Many suggested that youth should begin sexual education early (i.e., before middle school), which may increase the likelihood that they will apply this information to positive and responsible sexual health, including behaviors and decision making later in life. Given disparities in early teen pregnancy among AI youth, providing early, appropriate sexual education appears to be an important step. Engagement in extracurricular activities also was an important protective factor within the school system. The current findings support prior research findings highlighting the importance of a sense of belonging to one's school (Dickens et al., 2012; Moilanen, Markstrom, & Jones, 2014), particularly through engagement in sports-related activities. Informants suggested that being part of a larger group, such as an athletic team, was important for youth to feel as if they were accountable to something bigger than themselves. This finding aligns with research suggesting that feeling a sense of belonging is particularly important for AI youth due to the interdependent nature of AI communities and families (Sarche & Spicer, 2008). The concept of belonging also was woven throughout the responses suggesting the importance of social support from teachers, personnel, and peers at school, findings echoed by prior research (Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004). Finally, respondents reported that having educational goals was an important protective factor for AI youth. This finding is

particularly important, as research suggests that, for AI adolescents, having a child may provide an escape from the feeling that their opportunities (e.g., for higher education) are limited (Sipsma, Lewis, Ethier, & Kershaw, 2011).

The school system and numerous aspects within it appear to serve as vital protective factors in the sexual health and behaviors of AI youth. This is an important finding given the historical context within which AI people have often experienced formalized education (Churchill, 2004). While the impact of boarding schools must be considered when working with AI communities, findings from the current study suggest that respondents, including AI youth and elders, understand the important function the school system can have in encouraging positive sexual health and behaviors.

### **Enculturation**

Another evident theme indicated by respondents was the positive impact of culture and spirituality (referred to here as enculturation). In particular, findings indicated that cultural and spiritual activities were important macrosystem influences that empowered youth to engage in positive sexual behaviors. For example, one youth (non-parent) highlighted the struggle she felt between the sacred tradition of the Sun Dance and the risky behaviors in which many youth around her were engaging. In general, youth indicated that cultural activities align with positive decision making, and they were concerned about youth who engaged in sacred ceremonies while also engaging in risky behaviors. These findings suggest the impact that cultural traditions can have on youth and the value they see in these ceremonies, and further support prior research suggesting that promoting cultural activities and values is an important aspect in the positive development of AI youth (Heavy Runner & Morris, 1997).

However, responses suggesting the importance of enculturation were only indicated by elders and youth (parents and non-parents) from both sites. While it is reassuring that youth recognize the importance of cultural activities and spiritual practices in making positive choices, it is alarming that school personnel and health care providers did not recognize these protective factors present for the youth with whom they work. One potential reason for this finding is that half of the school personnel and health care providers in this study did not identify as AI; rather, they were individuals who worked with AI youth. This is an important finding in working to inform prevention efforts, in that it provides direction for future work. There is an evident need to train individuals who have a direct influence in the daily lives of AI youth about the importance of cultural activities and spiritual practices within Native cultures.

These findings are also of particular importance for Northern Plains AI youth, as prior research with this population has been mixed. Some findings indicate that enculturation may not necessarily function as a protective factor (Kaufman et al., 2007), while others suggest it promotes resilience (LaFromboise, Hoyt, Oliver, & Whitbeck, 2006).

We have engaged in various projects with the Northern Plains AI youth represented in the current study, and they show high levels of assimilation with mainstream culture. Prior findings suggest engaging in cultural activities such as Sun Dances, smudging, or powwows, can increase feelings of alienation for highly assimilated youth (Kaufman et al., 2007). The current findings are unique in suggesting that, while these youth may show features of cultural assimilation, they continue to recognize that risky behaviors are at odds with their cultural values. Thus, findings from the current study extend the literature suggesting the importance of enculturation for Northern Plains AI youth.

### **Limitations**

The focus of the present study was to identify protective factors present in the sexual health and behaviors of AI youth. The participants represented, however, were Northern Plains AIs and are not necessarily representative of AI/ANs nationwide. This is likely both a limitation and strength. While there is need for more research focused on the protective factors present in the sexual health and behaviors of AI/AN youth in general, it is also evident that, given the heterogeneity within this population, there is a need to examine specific regions/tribes in order to best inform culturally specific prevention efforts.

Participants included in the current study were from both urban and reservation sites, yet there were limited findings regarding potential similarities or differences between the two sites. Further, given that the goal of the current study was much broader—informing a positive youth development curriculum—data specific to sexual health protective factors were limited, which reduced our ability to conduct chi-square analyses examining potential differences between our multiple reporters and sites.

### **Future Directions**

Utilizing multiple informants from all arenas impacting AI youth sexual health and behaviors was viewed as a strength for the current study. Triangulation is a qualitative method used to check and establish validity in a study by gathering data from multiple perspectives.

Thus, future research could utilize similar methods, but expand by including questions that focus specifically and exclusively on sexual health and behavior protective factors. Including additional informants could also broaden the information collected and the potential impact of future studies. For example, including other school officials who work directly with AI students, such as principals or coaches, may provide another perspective on potential protective factors. Tribal leaders and those directly connected to and impacting policy change regarding AI sexual health and behaviors and the policies surrounding it could also be included. Finally, future studies could include both AI and non-AI youth to understand better what unique strengths and difficulties should be addressed in AI-specific programs.

### **Implications and Conclusion**

Findings across sites and informants suggesting the importance of the family structure and indicate the need to engage families within teen pregnancy prevention programs for AI youth. Given findings that highlight reservation-based elders as the most consistent source reporting the family as a protective factor, there is an evident need to include the family system in prevention efforts for urban youth, who may not have a larger family structure and associated support and discipline proximally available. Prevention program goals, especially among urban AI youth, may include facilitating communication between parents, the extended family (or a trusted adult), and youth to assist in building decision-making skills likely to impact their sexual health and behaviors.

As previously indicated, the history behind the education system for Native peoples suggests that it may not be considered a protective factor by all informants. However, findings from this study suggest the potential importance of the school system in providing culturally relevant prevention efforts focused on positive outcomes (e.g., service learning, community volunteering opportunities) wherein youth can engage with and feel accountable to their schools and communities. Further, prevention programs could engage both adults and peers to provide needed sexual education and support.

Finally, it appears evident that there is a need to develop culturally relevant prevention programs that incorporate both the cultural and spiritual traditions of AI communities. Such programs may be particularly important for urban AI youth who experience a lack of cultural connectedness and associated feeling of hopelessness due to distance from family or resources that reinforce culture as a protective factor (Freedenthal & Stiffman, 2004). These programs should work to preserve and sustain traditional cultural and spiritual teachings for both urban and

reservation youth through revitalization of cultural traditions and active engagement by all those involved. For example, AI community members might serve as mentors or guest speakers, sharing stories of cultural traditions and values around relationships and marriage. Program content also might address cultural pride and ethnic identity using Native concepts, teachings, and learning theories, such as the Medicine Wheel, which other programs have found to resonate with AI youth (de Ravello, Rushing, Doshi, Smith, & Tulloch, 2011). Prevention efforts would also benefit from educating school personnel and health care providers about the important cultural and spiritual traditions that encourage positive sexual health and behaviors.

While there has long been a call for teen pregnancy prevention efforts, little has been known about how to best approach pregnancy prevention and overall positive sexual health and behavior in Northern Plains AI reservation and urban communities. Findings from the current study provide direction on the systems most amenable to prevention efforts that can assist in strengthening critical protective factors and larger systems in the sexual health and behaviors of AI youth.

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# EPIDEMIOLOGY OF SUBSTANCE-EXPOSED PREGNANCIES AT ONE GREAT LAKES HOSPITAL THAT SERVES A LARGE NUMBER OF AMERICAN INDIANS

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*Abstract:* Objective: The purpose of this research was to determine the prevalence of substance-exposed pregnancies at a hospital in the Great Lakes region of the U.S. Method: Data were collected via retrospective chart abstractions of patients who were seen for delivery at one Great Lakes region hospital during a 1-year period who were given at least one of the International Classification of Diseases codes related to substance use. Results: A total of 342 medical records were included in the analysis, and, while much race/ethnicity data were missing, a large percentage of those in our analysis identified as American Indian. The prevalence of substance-exposed pregnancies at this hospital during a 1-year period was 34.5%. The majority (84.8%) were tobacco users, and many were found to have multiple substance exposures. Also, 48.5% were found to have a mental health diagnosis in addition to substance use. Conclusions: Data from this project can be used in prevention efforts, including preconception care for women at risk for substance use and mental health issues.

## INTRODUCTION

Alcohol, tobacco, and illicit drugs (i.e., marijuana, cocaine, methamphetamines, and opiates) have the potential to cause extensive harm to a developing fetus when a woman uses these substances during pregnancy. Sithisarn, Granger, and Bada (2012) conclude that the use of these types of substances by pregnant women represents a “public health problem and social morbidity with consequences on both the users and their children” (p. 105). Demographic covariates, including socioeconomic status, parity, prenatal care, race, and nutrition, often affect the varying degrees of impact that these substances can have on the short- and long-term health

of the infant (Minnes, Lang, & Singer, 2011). In addition, outcomes are impacted by the combination of drugs used during pregnancy. Many women who use substances are likely to be “polydrug users” (i.e., to use a combination of various substances; Sithisarn et al., 2012).

It is well known that alcohol consumption during pregnancy, especially binge drinking, has the potential to cause lifelong physical and cognitive effects (Floyd & Sidhu, 2004). Fetal alcohol spectrum disorder (FASD) is the continuum of outcomes in children prenatally exposed to alcohol and includes a diagnosis of fetal alcohol syndrome (FAS; Floyd, O'Connor, Sokol, Bertrand, & Cordero, 2005). Prenatal alcohol exposure may result in facial abnormalities, growth retardation, and delayed brain growth, including small head circumference (Centers for Disease Control and Prevention, 2004; Hoyme et al., 2005). In addition to physical features, prenatal exposure to alcohol is linked to conduct disorder, mental illness (i.e., depression, anxiety disorders) and psychosocial functioning (Disney, Iacono, McGue, Tully, & Legrand, 2008; Hellemans, Sliwowska, Verma, & Weinberg, 2009; Roebuck, Mattson, & Riley, 1999). Despite this knowledge, 5-9% of women report binge drinking during pregnancy and 10-30% of pregnant women consume moderate amounts of alcohol (Ethen et al., 2009; Floyd & Sidhu, 2004; Tsai & Floyd, 2004).

Smoking during pregnancy can impact pregnancy outcomes as well, increasing a woman's risk of ectopic pregnancy (Horne et al., 2014; Minnes et al., 2011). In addition, tobacco use during pregnancy has been linked to low birth weight, premature delivery, placental abruption, and intrauterine death, with some evidence linking smoking during pregnancy with Sudden Infant Death Syndrome (Horta, Victora, Menezes, Halpern, & Barros, 1997; Minnes et al., 2011; Spiegler et al., 2013; Warland & Mitchell, 2014). With these outcomes in mind and while the risks of tobacco smoking overall are clearly established, in 2007 an estimated 15.9% of pregnant women were current tobacco smokers (Substance Abuse and Mental Health Services Administration [SAMHSA] & Office of Applied Studies, 2013).

Finally, drug use during pregnancy has the potential to cause harm to the developing fetus, depending on the type and amount of substance used. Table 1 represents a few of the potential outcomes of illicit drug use during pregnancy on the infant (Minnes et al., 2011; Sithisarn et al., 2012). The average rate of use of these substances is approximately 5% in pregnant women, with a range from 0.4% (cocaine) to 3.8% (marijuana; Patrick et al., 2012;

Sithisarn et al., 2012), although these statistics might be underestimated, as the data were self-reported. However, as physiological tests improve and become routinely used, estimates of substance use during pregnancy likely will increase.

**Table 1**  
**Potential Outcomes of Drug Use During Pregnancy<sup>a</sup>**

<b>Marijuana</b>	<b>Stimulants (including cocaine and methamphetamines)</b>	<b>Opiates</b>
Vasoconstriction of fetal oxygen supply to fetus	Vasoconstriction of fetal oxygen supply to fetus (cocaine)	Increased risk of premature delivery, gastrointestinal dysfunction, stillbirth, and SIDS
1-week shorter gestational period	Reduced weight, head circumference, and/or length at birth (cocaine)	Seizures (2-11% of neonates)
Neurobehavioral outcomes, including poor autonomic control	Increased or impaired behavioral and physiological reactivity to stress (cocaine)	Decreased birth weight, birth length, and head circumference
Learning deficit and impaired emotional reactivity	Small for gestational age and have lower average birth weight (meth)	Impact on infant CNS and autonomic nervous system
Abnormalities associated with visual system	Alters memory or signal processing (meth)	Poorer mental development or functioning

<sup>a</sup> Sources: Minnes et al., 2011; Sithisarn et al., 2012

As highlighted, there are ample national data on substance use during pregnancy. However, research focused on smaller pockets of high-risk women is harder to come by. For example, anecdotal information from staff at a hospital in the Great Lakes region of the U.S. indicated concern about frequent substance use during pregnancy. Staff felt that this was a substantial issue within the hospital, yet there were no clear epidemiological data that supported these claims, although descriptions of the community and geographic area point to possible substance use disparities when compared to national data. This hospital serves a small urban center of approximately 15,000 citizens, 26% of whom live below the poverty line. As outlined by SAMHSA (2015), neighborhood poverty is a community risk factor that contributes to substance use disorders. In addition, the area surrounding this small urban center is extremely rural in nature; national data show that alcohol use is higher in rural areas (Chan et al., 2015; Shaw et al., 2014), and, while drug use is generally lower in rural areas, methamphetamine use is on the rise in rural communities (Chen et al., 2014).

In addition to socioeconomic factors and geographic location, the community that the hospital (a non-tribal and non-Indian Health Services medical center) serves is surrounded by three AI reservation communities, and 12% of those living within the small urban community identify as AI. While AIs in general are more likely than non-Natives to abstain from alcohol and other substances, AIs who *do* drink and use illicit drugs tend to do so at heavier levels (SAMHSA, 2010; May & Gossage, 2001; Spicer et al., 2003). While substance use rates vary greatly among tribes, AIs are especially at risk for alcohol- and drug-related consequences when compared to the U.S. population in general (Beauvais, 1998). Within AI communities, alcohol and drug use disproportionately contributes to and is, in turn, influenced by mental health problems, early trauma and childhood abuse, cultural displacement, unemployment, and poverty (Rieckmann et al., 2012). Historical trauma significantly increases the odds of developing substance use disorders among AIs (Whitesell, Beals, Big Crow, Mitchell, & Novins, 2012), as does the trauma associated with domestic violence, loss, and racism (Rieckmann et al., 2012).

Because of the anecdotal information from hospital staff, in conjunction with the potential for substance use because of socioeconomic and geographic risk factors, this research was conducted to determine the prevalence of substance-exposed pregnancies at this hospital, including types of substances most commonly used during pregnancy and the prevalence of multiple substances. The goal also was to highlight pregnancy-related behaviors, such as prenatal health care utilization, among those using substances during pregnancy, and to evaluate the impact of substance-exposed pregnancies on birth outcomes.

## METHODS

Institutional review board approval was gained from the hospital before data collection began. Individual participant consent was waived. Data were collected via retrospective chart abstractions of patients who were seen on the obstetrics floor at one hospital in the Great Lakes region during a 1-year period and who were given at least one of the International Classification of Diseases, version 9, (ICD-9) codes in Table 2 during their time on the obstetrics floor to deliver their baby. Besides a record of substance use, mental health disorders were included to more fully capture possible prenatal patients who use substances, as mental and substance use conditions often co-occur (SAMHSA, 2013). Codes related to mental health disorders were

utilized to help identify those using substances only. Patients who *only* had a mental health disorder code were not included in the analysis. To avoid replications, staff used medical chart numbers to identify individual participants.

**Table 2**  
**ICD-9 Codes Used in the Present Study**

648.32	Drug dependence of mother, delivered, with mention of postpartum complication
648.41	Mental disorders of mother, delivered, with or without mention of antepartum condition
648.42	Mental disorders of mother, delivered, with mention of postpartum complication
305.20	Specific types of drug abuse (such as cannabis), unspecified, continuous, episodic, or in remission
649.01	Tobacco use disorder complicating pregnancy, childbirth, or the puerperium, delivered, with or without mention of antepartum condition
649.02	Tobacco use disorder complicating pregnancy, childbirth, or the puerperium, delivered, with mention of postpartum complication
305.00	Alcohol abuse, unspecified
303.90	Other and unspecified alcohol dependence, unspecified
303.91	Other and unspecified alcohol dependence, continuous
303.92	Other and unspecified alcohol dependence, episodic
303.93	Other and unspecified alcohol dependence, in remission

Once eligible medical records were identified, the medical charts were pulled and relevant data were abstracted by two trained chart abstractors and entered into a database. Provider/physician notes within the medical record were reviewed as part of this process. Quality assurance for the data entry was ensured by re-abstracting the first 100 charts to identify and resolve data entry errors. Key variables abstracted included the age and race/ethnicity of the mother, as well as any history of smoking, illicit drug use, alcohol use, and/or alcohol treatment at any time before, during, or after the index pregnancy. Other variables collected included prenatal care history, such as the number of total prenatal visits and when prenatal care started (by trimester of pregnancy); any mental health diagnoses; and infant outcomes—specifically, birth weight and estimated gestational age at birth. It is important to note that any data on the infant were abstracted from the mother’s medical record, as a review of the infant’s medical record was not conducted.

Data from the retrospective chart abstractions were analyzed using descriptive statistics and logistic regression before and after imputation of missing data. Prevalence was calculated as the number of deliveries with the ICD-9 codes in Table 2 (exclusive of those with only a code for a mental health condition) divided by the total number of deliveries at the hospital for the same time period. For continuous variables, means were calculated as appropriate. Categorical variables were described using frequencies and percentages.

There were some data missing from the dataset, which is typical in epidemiological studies, especially those including data on substance use (Burgette & Reiter, 2010). Because analysis with missing data may cause biased parameter estimates, several methods have been proposed to impute missing values. We used multivariate imputations by chained equations “mice” package in R (3.2.2) to impute the missing values (van Buuren & Groothuis-Oudshoorn, 2011). This approach performs the imputation algorithm a number of times, resulting in several data sets each with different imputed values. The imputation model includes the six substance use variables: smoking prior to pregnancy, smoking during the index pregnancy, alcohol use at any time, alcohol use during the index pregnancy, drug use at any time, and drug use during the current pregnancy, as well as six additional variables to provide further information: number of prenatal visits, trimester of first prenatal visit, race, marital status, education level, and employment status. The analysis of the data was repeated for each imputed data set and estimates were combined to account for the uncertainty surrounding the missing data. We used five imputation sets for this study.

The imputed complete datasets were used for logistic regression to identify effect of risk factors (smoking prior to pregnancy, smoking during the index pregnancy, alcohol use at any time, alcohol use during the index pregnancy, drug use at any time, drug use during the current pregnancy) on gestational age at birth. Gestational age was categorized into two groups: < 37 weeks (preterm) and  $\geq 37$  weeks (term and post term). Age at delivery also was included in all the models as a possible confounder. Analysis was performed using PROC LOGISTIC in SAS software, version 9.4.

## RESULTS

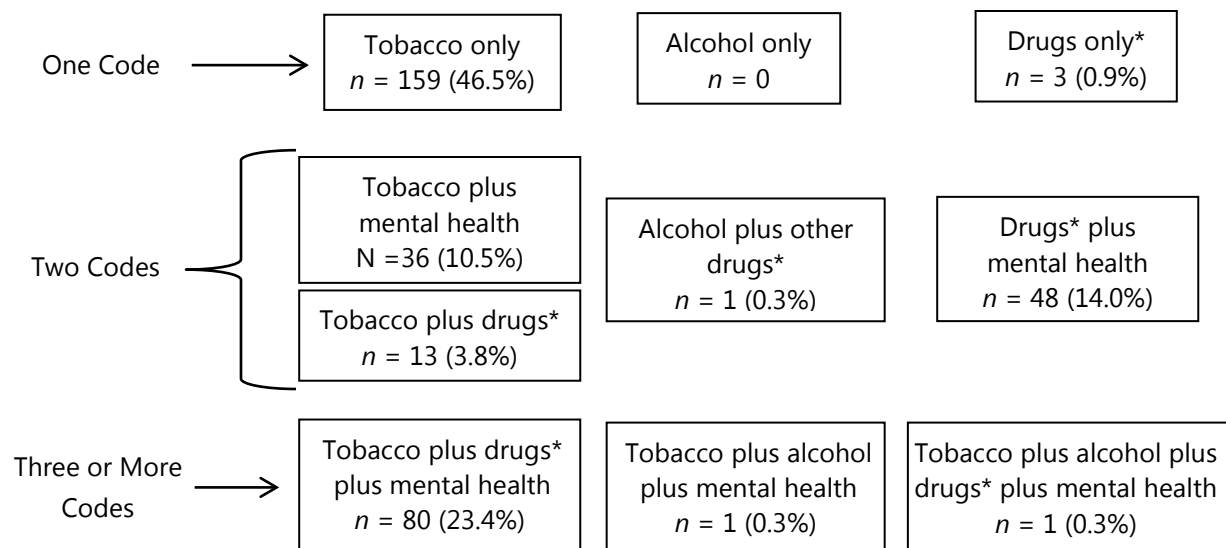
Out of 991 total deliveries at the hospital in 2012, 402 were identified as having one of the ICD-9 codes in Table 2 and were thus abstracted for additional information. Of these, 7 were subsequently found to not have a code listed in Table 2 and 53 that were abstracted had a mental disorder code only (thus no substance exposure), leaving a final sample size of 342 for analysis. Therefore, the estimated rate of substance-exposed pregnancies (alcohol, tobacco, or other drugs) at this particular hospital during a 1-year time period was 34.5% based on the ICD-9 codes. See Table 3 for demographic features of this sample. While much data on race/ethnicity were missing (44.4% of the total sample), 148 (43.3%) of those included in the analysis were AI or Alaska Native. The average age of the sample was 25.4 years ( $SD = 5.5$ ), with a range of 14 to 44 years. The majority ( $n = 220$ ; 64.3%) had previous deliveries, indicating that this was not their first pregnancy.

**Table 3**  
**Demographics of Abstracted Charts ( $N = 342$ )**

	<i>n</i>	%
<b>Race</b>		
American Indian or Alaska Native	148	43.3
Caucasian	40	11.7
Hispanic	1	0.3
Native Hawaiian or Pacific Islander	1	0.3
Not given or missing data	152	44.4
<b>Marital Status</b>		
Single	231	67.5
Married	42	12.3
Partner/significant other	30	8.8
Other	23	6.7
Separated/divorced	15	4.4
Not given or missing data	1	0.3
<b>Education Level</b>		
Did/has not finish high school	54	15.7
High school diploma	41	12.0
Some college	32	9.4
Not given or missing data	215	62.9
<b>Employment</b>		
Unemployed	127	37.1
Homemaker	59	17.3
Student	56	16.4
Work full-time	49	14.3
Other	49	14.3
Not given or missing data	2	0.6
<b>Age at delivery (mean, <i>SD</i>)</b>	25.4	5.5

Of the 342, the majority were tobacco users ( $n = 290$ ; 84.8% of the sample), with 159 (54.8% out of the total tobacco users and 46.5% of the total sample) using tobacco *only*. Most women were found to have multiple substance exposures. Specifically, a total of 180 (52.6%) had two or more codes (i.e., were both using drugs/alcohol and smoking or were using multiple drugs). See Figure 1 for the numbers who were using specific substances, including a list of types of drugs used. As well, many chart abstractions revealed comorbidity of substance use and identified mental health issues such as depressive disorders, anxiety, bipolar disorder, or post-traumatic stress disorder. Specifically, 166 (48.5%) women in this sample were found to have a mental health diagnosis in addition to a code for substance use. Regarding prenatal health care, nearly all women (95.9%) had at least one prenatal care visit prior to delivery. However, only 61.4% had their first prenatal care visit in the first trimester (as recommended); 23.4% had their first visit in the second trimester, and 9.4% in the third trimester. A total of 9 (2.6%) had no prenatal care. Also, when analyzing health care provider notes, many indicated “insufficient prenatal care.”

**Figure 1**  
**Type of substance used by sample (total sample  $n = 342$ )**



\* Drug Type: Opioid ( $n = 30$ ); marijuana ( $n = 12$ ); cocaine ( $n = 2$ ); methamphetamine ( $n = 5$ ); other/not specified ( $n = 119$ ). Note this number is greater than the total number of individuals using drugs because some individuals were polydrug users.

As well, substance use impacted birth outcomes. Of the 331 charts for which birth outcome data were available, 27 (8.2%) were low birth weight (i.e., < 5 pounds, 8 ounces) and 42 (12.5%) were preterm (i.e., gestational age < 37 weeks). In addition, the preterm birth of the index pregnancy was associated with drug use during the current pregnancy after adjusting for maternal age, as highlighted in Table 4. Odds ratios for drug use at any time were similar, but only just reached statistical significance in the imputed data. Model estimates were consistent with or without multiple imputations for missing variables. Drug use during the current pregnancy also was significantly associated with preterm birth ( $p < 0.05$ ) when controlling for maternal age, smoking, and alcohol consumption during pregnancy. Maternal age was significantly associated with preterm birth; as age increased preterm birth also increased (Table 4).

**Table 4**  
**Regression Results of Prenatal Substance Use on Preterm Gestational Age**

Regression Results of Prenatal Substance Use on Fetal Gestational Age									
		Observed Data				With Multiple Imputation			
Risk Factor	<i>n</i> Missing	OR <sup>a</sup>	Lower CI	Upper CI	<i>p</i> Value	OR <sup>a</sup>	Lower CI	Upper CI	<i>p</i> Value
<b>Smoking</b>									
Prior to pregnancy	153	0.78	0.16	3.81	0.76	1.04	0.24	4.63	0.95
During current pregnancy	18	1.93	0.44	8.51	0.38	2.06	0.46	9.11	0.34
<b>Alcohol Use</b>									
At any time	151	0.90	0.37	2.18	0.81	0.91	0.40	2.05	0.82
During current pregnancy	101	1.17	0.24	5.58	0.85	1.14	0.20	6.47	0.87
<b>Drug Use</b>									
At any time	64	2.30	0.95	5.57	0.07	2.45	1.00	5.98	0.05
During current pregnancy	51	2.46	1.15	5.26	0.02	2.35	1.09	5.05	0.03
<b>Multivariate model</b>									
	138								
Smoking current pregnancy		1.91	0.41	8.86	0.41	2.02	0.45	9.13	0.36
Alcohol use current pregnancy		0.61	0.07	5.28	0.66	0.92	0.16	5.20	0.92
Drug use current pregnancy		3.42	1.44	8.14	0.01	2.34	1.10	4.98	0.03
Maternal age at delivery		1.08	1.00	1.17	0.04	1.08	1.01	1.14	0.01

<sup>a</sup> All models included maternal age at delivery

## DISCUSSION

As noted, a large percentage (more than 30%) of women delivering a baby at a hospital in the Great Lakes region of the U.S. were given ICD-9 codes related to some type of substance use during pregnancy. While these data are limited to a very small geographic location in the Great Lakes region of the U.S., the implications may be far reaching. A community this small (approximately 15,000 people) with high poverty rates, surrounded by rural, remote areas, and with a relatively large number of racial minorities could represent many similar locations that may have prenatal substance use problems but little data to highlight the need for prevention funding. National published data on substance use during pregnancy may not adequately reveal the full public health epidemic that is occurring in very high-risk communities, such as those in rural or impoverished areas.

Of additional note, many of the participants were identified as AI or Alaska Native. This finding was not necessarily surprising, as large numbers of AI communities surround this particular hospital, and many residents deliver their babies there. More on differences by race/ethnicity cannot be highlighted, however, because much relevant data were missing from the charts. The race/ethnicity item on the hospital's form is optional, and participants often are not asked by staff. Therefore, we do not know if the high rates of substance use during pregnancy truly come from the subpopulation of AIs that are seen within this hospital. Additional studies are needed within this community, especially in partnership with local tribal and Indian Health Service health facilities, to better understand the issue of substance use during pregnancy in AI women and to develop community-based prevention efforts.

In terms of specific behaviors, when compared to national data, the rates of smoking during pregnancy at this Great Lakes hospital were much higher. National prenatal smoking rates range from 12.3% to 15.9% (SAMHSA, 2013; Tong et al., 2013), while 290 (approximately 29.3% of annual deliveries) of women at this hospital were given a prenatal tobacco ICD-9 code. Alcohol rates in this sample were found to be lower than in other studies, with approximately 2% in this sample who drank at least some amount of alcohol during pregnancy (the amount of alcohol was not specified in medical records), compared to national rates of 5-9% of pregnant women with reported binge drinking and 10-30% with moderate consumption of alcohol (Ethen et al., 2009; Floyd & Sidhu, 2004; Tsai & Floyd, 2004). The reasons for only a small number of

ICD-9 codes for prenatal alcohol consumption are unclear, although they may relate to a reluctance among providers to screen for prenatal alcohol exposure due to social stigma behind it (Davis, Thake, & Vilhena, 2010; Lange, Shield, Koren, Rehm, & Popova, 2014; Northcote & Livingston, 2011), or because other substance use might be easier to extrapolate (i.e., smoking) or might be of greater concern (i.e., drugs). Our results did not provide important data regarding prenatal alcohol exposure, such as drink size and low/moderate drinking versus binge drinking (Dawson, 2011; Witbrodt et al., 2007).

Of additional concern was that illicit drug use in this sample was high when compared to national rates, although many times the specific type of drug used was not indicated in the medical records. In this sample, 146 patients (14.7%) were found to be using some type of drug, compared to approximately 5% of women nationally who have reported substance use during pregnancy (Patrick et al., 2012; Sithisarn et al., 2012). In addition, some women were “polydrug users” (i.e., they used a combination of various substances during pregnancy). The use of multiple substances indicates that prevention and intervention efforts need to be multifaceted, addressing the full picture of substance use that is occurring. For example, some communities in the area feel there is a serious opioid problem among pregnant women, but the results from this study highlight that women’s prenatal substance use is more complex and in need of multilevel intervention efforts (Drake, Mueser, Brunette, & McHugo, 2004).

Of additional importance are the variations in effect on preterm birth by *type* of substance used. For example, there was an elevated risk of preterm birth for women with an indication of drug use during the current pregnancy, and drug use continued to be a significant factor after controlling for smoking and alcohol consumption. There were no significant associations for either smoking during pregnancy or alcohol use during pregnancy when controlling for the other behaviors. This result indicates that, even within this very select population in which negative birth outcomes are expected, there were variations on the impact of substances based on the type (drugs vs. alcohol vs. tobacco).

Another significant finding was that maternal age was significantly associated with preterm birth (as age increased, so did preterm birth). Keeping that finding in mind, the women in this study with substance-exposed pregnancies were particularly young mothers, as the average age of the sample was 25.4 years. In addition, 23.1% were under the age of 21 years, indicating a cohort of young women with substance-exposed pregnancies who were teenage mothers. A previous national study found that, although age was significantly associated with

higher risk for a substance-exposed pregnancy, there was no clear pattern (Cannon et al., 2014). This same study also found that risk for a substance-exposed pregnancy was significantly associated with younger age at first intercourse, indicating that women who have sex (and are thus at risk for pregnancy) at earlier ages are also at risk of drinking, using drugs, or smoking during these pregnancies (Cannon et al., 2014). As well, a review of tobacco and alcohol use within the context of adolescent pregnancy concluded that “adolescent girls are more likely than women of other ages to smoke tobacco or drink alcohol during pregnancy,” highlighting both the “interconnections between [substance] use with adolescent pregnancy” and also the need to focus prevention efforts on young women (Bottorff et al., 2014, p. 561).

Finally, the results of this study point to the large issue of comorbidity among women with a mental health disorder who also use substances. As previous research has found, substance use disorders and mental disorders—such as depression, bipolar disorder, post-traumatic stress disorder, conduct disorders, anxiety, and other personality disorders—commonly co-occur and are mutually detrimental (Farren, Murphy, & McElroy, 2014; Grant, Hasin, Chou, Stinson, & Dawson, 2004; Jacobsen, Southwick, & Kosten, 2001). Of great concern, pregnant women often face this comorbidity, with previous research finding that pregnant women with mood or anxiety disorders are more likely to have a substance use disorder as well (Gyllstrom, Hellerstedt, & McGovern, 2011; Le Strat, Dubertret, & Le Foll, 2011). For example, a previous study found that, among pregnant women who smoke, 45.1% met criteria for at least one mental disorder (Goodwin, Keyes, & Simuro, 2007). Unfortunately, preconception and prenatal health appointments, which are key in preventing and/or addressing possible substance use during pregnancy, are lower for women reporting frequent mental distress (Farr & Bish, 2013; Pagnini & Reichman, 2000).

## Limitations

This study was confined to one hospital in a specific geographic region; thus, the results are not generalizable. However, they point to the large issue of substance-exposed pregnancies at this particular hospital and possibly to the general region, indicating that larger systems-based studies are necessary for comparison data. Also, this is a retrospective as opposed to a prospective study, and much of the data were labeled in medical records as self-reported, rather than obtained via physiological testing or biomarkers. Therefore, there is potential for reporting bias, and it is possible that substance use was overestimated in some populations and

underestimated in others. Likewise, there were much missing data within the medical records, including data on race/ethnicity, education, and employment. Demographic questions such as race/ethnicity do not require a response on the hospital's intake form, thus limiting analyses based on these features. Substance use also was missing frequently in the medical records, especially for alcohol, limiting our ability to make firm conclusions based on this data. However, a preliminary study such as this can be utilized to develop larger studies that involve multiple data sources.

### Implications for Practice

Data from this project can be used to develop intervention and prevention efforts, including promoting preconception care for women at risk for substance use and for those with mental health issues. There is a national push to focus on preconception care as a way to prevent prenatal alcohol exposure (Floyd et al., 2014; Temel, van Voorst, Jack, Denktas, & Steegers, 2014). In addition, this type of surveillance data can be used to raise awareness among health care professionals and the patient population about the issue of substance use during pregnancy, especially use of multiple substances during pregnancy and the need for education about comorbid treatment. The data also can be used as a legitimate means of identifying appropriate referral resources for women in rural and tribal communities, recognizing gaps in treatment and referrals for services, and providing support for affected individuals and families. Finally, the data from this project can be utilized to shape public policy locally and federally, as well as to determine future funding allocations.

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# **SHAPING A *STORIES OF RESILIENCE MODEL* FROM URBAN AMERICAN INDIAN ELDERS' NARRATIVES OF HISTORICAL TRAUMA AND RESILIENCE**

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*Abstract: American Indians (AIs) have experienced traumatizing events but practice remarkable resilience to large-scale and long-term adversities. Qualitative, community-based participatory research served to collect urban AI elders' life narratives on historical trauma and resilience strategies. A consensus group of 15 elders helped finalize open-ended questions that guided 13 elders in telling their stories. Elders shared multifaceted personal stories that revealed the interconnectedness between historical trauma and resilience, and between traditional perceptions connecting past and present, and individuals, families, and communities. Based on the elders' narratives, and supported by the literature, an explanatory Stories of Resilience Model was developed.*

## **INTRODUCTION**

In 2010, American Indians and Alaska Natives (AI/ANs) living in urban areas made up 78% of the total number of AI/ANs in the U.S. (Norris, Vines, & Hoeffel, 2012, p. 12); many were descendants of those who first came to urban areas during the federal government relocation policy that started in the 1950s (National Urban Indian Family Coalition [NUIFC], 2011). NUIFC (2011) defines the urban Indian population as “individuals of American Indian and Alaska Native ancestry who may or may not have direct and/or active ties with a particular tribe, but who identify with and are at least somewhat active in the Native community in their urban area.” In 2010, the urban AI/AN population in Tucson, Arizona was 14,055—2.7% of a total population of 520,570 (U.S. Census Bureau, 2015). An estimated 20.3% of this Tucson urban AI population was age 45 years and older (Urban Indian Health Institute [UIHI], 2011).

AI/ANs in urban areas experience higher rates of poverty, unemployment, low education, homelessness and health disparities compared to the general population (NUIFC, 2011). In Tucson, 35.2% AI/ANs live below the federal poverty rate in comparison to 15.7% of the general population. AI/ANs over the age of 16 years experience higher rates of unemployment (20.9%) than the general population (7.4%). Heart disease, cancer, unintentional injury, diabetes, and chronic liver disease are the top five causes of mortality for the Tucson AI/AN population (UIHI, 2011). While urban AI/ANs share many of these socioeconomic and health disparities with AI/ANs living on tribal lands, urban residents face unique challenges, including separation from tribal support networks (NUIFC, 2011).

Despite differences, the families and ancestors of both urban and reservation-based AI/ANs have experienced similar sociohistorical stressors that contribute to historical trauma. Few studies to date have focused on the resilience of urban AIs (Myhra, 2011) or AI elders (Grandbois & Sanders, 2009). This study gathered urban AI elders' life narratives to document resilience strategies for coping with life stressors in the context of historical trauma. The stories collected offered a window into perceptions of and experiences with stress and resilience.

## Historical Trauma

The contemporary social, economic, and health disparities of AIs are linked to historically traumatic events of colonization, national policies, and government practices aimed at assimilating AI tribes into mainstream America (Brave Heart, 2003; Brave Heart, Chase, Elkins, & Altschul, 2011; Brave Heart & DeBruyn, 1998; Goodkind, Hess, Gorman, & Parker, 2012; Washburn, 1988). These historical processes resulted in reduced population numbers, more sedentary lifestyles, disrupted social structures, and culture loss (Brave Heart et al., 2011; Washburn, 1988). Brave Heart (2003, p. 7) defined *historical trauma* as “cumulative emotional and psychological wounding, over the lifespan and across generations, emanating from massive group trauma.” Historical trauma resulted in *historical trauma response*, including a cluster of symptoms or maladaptive behaviors associated with *unresolved historical grief*. Transmitted across generations (Brave Heart et al., 2011), this unresolved intergenerational distress has been conceptualized as one underlying factor for current higher rates of ill health, and the loss of traditional values and practices as a contributing factor in unhealthy lifestyle changes (Berg et al., 2012; Brave Heart & DeBruyn, 1998; Stumblingbear-Riddle & Romans, 2012).

## Resilience

During the first 50 years of resilience research in psychology and psychiatry, researchers (e.g., Anthony, 1987; Rutter, 1985) focused on individual resilience mostly by examining the positive development of children and youth in adversity from non-Indigenous perspectives and with little attention to the social context (i.e., family, community, culture). These early concepts of individual resilience as a personal trait were replaced by an understanding of individual resilience as a process largely driven by social, cultural, and physical contexts (Fleming & Ledogar, 2008; Kirmayer, Dandeneau, Marshall, Phillips, & Williamson, 2011; Kirmayer, Sehdev, Whitley, Dandeneau, & Isaac, 2009; Luthar, Cicchetti, & Becker, 2000; Ungar, 2008, 2011; Wexler, 2013). More recently, Ungar (2008, 2011) has argued that the construct of resilience has experienced a shift in focus to contextual factors and become viewed as multidimensional and flexible:

In the context of exposure to significant adversity, whether psychological, environmentally, or both, resilience is both the capacity of individuals to navigate their way to health-sustaining resources, including opportunities to experience feelings of well-being, and a condition of the individual's family, community and culture to provide these health resources and experiences in culturally meaningful ways (Ungar, 2008, p. 225).

A social ecological definition (Ungar, 2012a, 2012b, 2011) draws attention to resilience at levels larger than the individual. Within the socioecological model, family interacts with the larger community and its social systems, drawing on culture and identity to promote resilience. Community systems themselves can demonstrate resilience by achieving balance within changing contexts. Community resilience entails relational and collective processes where individuals, family units, communities, and the larger environment are interconnected, yielding protective factors to counter adversities (Kirmayer et al., 2009).

Kirmayer and colleagues (2011, 2012) suggest that community resilience is compatible with Indigenous values of relationships among people and with the environment. Distinct notions of personhood, where individuals are connected to the land and the environment, shape Indigenous ideas of individual resilience. Indigenous views of community resilience include revisioned collective histories that value Indigenous identity; the revitalization of language, culture, and spirituality; traditional activities; collective agency; and activism. Oral history and storytelling are traditional means of conveying cultural notions of personhood, value systems, and strategies of resilience (Denham, 2008; Fleming & Ledogar, 2008; Goodkind et al., &

Parker, 2012; Kirmayer et al., 2009, 2011, 2012). In urban settings, it may be more difficult to find shared cultural practices, as Indigenous residents may adopt multicultural values, attitudes, and activities (Kirmayer et al., 2009). For urban AI/ANs, pan-Indian activities such as powwows or sweats may function as shared cultural AI practices.

## METHODOLOGY

A qualitative methods study that engaged the University of Arizona (UA) and Tucson Indian Center (TIC) used a community-based participatory research (CBPR) approach (Israel et al., 2003) to explore urban AI elders' resilience strategies to cope with life stressors in the context of historical trauma.

The TIC has served a culturally diverse AI urban community for over 50 years (<http://ticenter.org/>). Services provided include social services, health and wellness services, and events such as health fairs and cultural celebrations. The mission of the TIC is “to lead, serve, empower and advocate for the Tucson urban American Indian Community and others, by providing culturally appropriate wellness and social services” (<http://ticenter.org/>). Open to the public, the TIC serves approximately 6,000 to 8,000 clients per year regardless of tribal affiliation (J. Bernal, personal communication, March 17, 2011).

University researchers worked with TIC leadership to develop a 13-person community advisory board (CAB) consisting of TIC staff, AI elders, and university researchers. We co-designed the project based on the TIC leadership's interest in addressing elders' concerns that loss of culture would result in poor health for Native youth (TIC, 2008), and to support the positive attitudes of elders that they held despite numerous past and current hardships (J. Bernal, personal communication, February 3, 2011). Elders were involved in the research process both in an advisory function as CAB members and/or as research participants. All research activities and protocols were approved by the UA Institutional Review Board and the TIC Board of Directors.

## Procedures

Two university-based AI researchers who had prior experience working with TIC elders recruited the potential participants by verbally explaining the project activities, time commitment, and goal at the TIC. Individuals were eligible if they self-identified as AI, were 55 years of age and older, lived in Tucson, received services from the TIC, and were willing to share their stories.

Two data collection methods were used. The two university-based AI researchers who had recruited participants conducted a consensus group with 15 AI elders to discuss and finalize interview questions; the group considered draft questions developed using existing literature (Duran, 2006; Goodkind et al., 2012; Kahn-John, 2010). The discussion was audio recorded and led to the revision of the questions. AI elder feedback led to the expansion of the interview guide from the initially proposed 11 questions to 25 final questions.

This interview guide was used in a series of two face-to-face interviews with each participant to document and review each elder's life narrative, with a focus on historical trauma and resilience strategies. Six of the 13 elders interviewed had participated in the consensus group. The first interview took 1-2 hours for each participant. Eleven elders gave approval to be video- and audiotaped, and two elders agreed to be only audiotaped. Each elder received an edited copy of their full interview. During the second interview, each elder approved or requested revisions, after which four UA research team members transcribed the interviews verbatim in preparation for qualitative analysis. One of the two audio recordings was deleted after its transcription was completed because the elder wanted to remain completely anonymous.

The interview began with the interviewer providing a culturally appropriate introduction (e.g., by sharing her tribal and clan membership, where she grew up, and current residence and occupation). The interview consisted of three sections: 1) demographic information, including personal background and connection to the Tucson urban community; 2) an open-ended, semi-structured interview focused on perceptions of the term *historical trauma* and culturally appropriate or alternative terms, knowledge of ancestors' experiences of historical trauma, and impact of these experiences; and 3) open-ended questions focused on perceptions of the term *resilience* and culturally appropriate or alternative terms, examples of urban AI community resilience, positive experiences and factors contributing to personal and family strength and well-being, and advice for AI urban youth to address adversities.

## Analysis

Qualitative analysis combined consensus (Teufel-Shone et al., 2014; Teufel-Shone, Siyuja, Watahomigie, & Irwin, 2006) and thematic analysis (Patton, 2002) approaches. The consensus approach served to develop deductive and inductive codes. Six team members read two to four of the interviews and created content codes. The first author, a trained qualitative researcher, drafted a coding book based on all team members' codes, and organized codes into

the two broad categories of *historical trauma* and *resilience*. Each category had several codes for themes and associated patterns. University researchers and one elder discussed and revised the coding book (See Appendix A, Table 1) based on consensus building.

The first author and the third author, a doctoral student, worked with the qualitative data analysis program NVivo to apply the codes in their independently conducted thematic analyses. Inter-coder-reliability scores were determined and the two researchers met to discuss and build consensus about conflicted coded sections. Themes and patterns were summarized further and organized into a table by category. The analysts solicited feedback from the CAIR research team and the TIC CAB, and incorporated this feedback into their interpretation of the data analysis.

## RESULTS

Several themes and associated patterns were revealed in the two categories of *historical trauma* and *resilience*. Historical trauma themes included *Indigenous concepts*, *sense of loss*, and *contemporary adversities*. Resilience themes were *Indigenous concepts* and *individual, family and community resilience*.

### Historical Trauma

#### Indigenous Concepts

Most elders did not recognize the concept of historical trauma until it was described in terms of how other AI communities had defined it. The elders then redefined historical trauma in their own words; indeed, all elders told stories of historical trauma. Referring to the past, these stories talked about “disturbing times,” and “events that ancestors went through.” Elders talked about ancestors surviving specific traumatic events, such as the Wounded Knee Massacre in South Dakota in 1890, and shared stories about specific relatives (e.g., a grandmother who escaped the Navajo’s Long Walk to Bosque Redondo in 1864). Other stories focused on grandparents and parents who lived through hard times of scarce resources, sickness and death, discrimination, and boarding schools. One elder talked about the fear related to land being taken away during colonialism, early settlers, treaties through which ancestors were tricked into signing legal documents, and the establishment of reservations. Elders referred to historical trauma as “the sadness that comes from the non-Indians oppressing us,” “historical culture shock,” loss with a focus on language (“I don’t understand my talk, my language”), “soul loneliness,” which referred to the lack of a family support system, and “continued

discrimination.” These stories of historical trauma were accompanied by stories of resilience. Elders admired their grandparents and parents who had encountered adversities but knew how to survive, had skills, did not complain, and were strong.

Referring to the present, elders challenged the youths’ lack of understanding of historical trauma (as defined by the elders) and thought that if the younger generation were taught about it, the intergenerational transmission of historical trauma could be stopped. One elder suggested changing the term to “broken families” so that youth who had experienced fear associated with alcohol abuse in families would understand historical trauma. The same elder envisioned “broken families” to become “healing families.”

### **Sense of Loss**

Elders expressed a sense of loss related to culture, language, traditions, and family life. The effects of boarding schools on their parents and grandparents seemed to be at the center of historical events leading to this loss. Elders reflected on how boarding schools must have traumatized the children who were taken away from their homes, had their hair cut, and were punished if they spoke their language. Being at boarding school meant being removed from the tribal lands that were closely tied in with culture and traditions, including subsistence practices (farming and hunting), beliefs (traditional spirituality), and values (having respect for oneself and others). Boarding schools separated children from their families, which led to a loss of contact with relatives, especially elders, who passed on culture and traditions. Family members could no longer teach Native languages or engage children in family activities. Boarding schools had long-term consequences, including “broken families” and current disruptions of family life. Some elders had alternative accounts of being removed from their families (i.e., they were adopted and raised by White families off reservation).

In their stories, elders expressed a yearning for the past that ranged from wishing they had lived during their ancestors’ times, to wanting more knowledge of culture and language to pass on to their children, to wanting to live off the land. Some quotations from elders illustrate this yearning:

I wish I was my mom sometimes. ... When I see what they [elderly people] have been through. . . you know, it’s amazing. They are so strong and they know so much. I wish I could turn the clock and sit there at their lap or at their knees and want to hear everything that they said and did way back then. What was taught to them, because I . . . ask my mom “tell me some more, so I can tell my kids.”

We don't speak it fluently so, yeah, it is kinda sad. And I wonder why and then I hear other tribes speak their language really good and fluent. . .you know, their language. It needs to come back to our tribe, we need to bring it back.

I also feel that the way they lived, they were strong people and they did a lot of things. I wish we could still do things the way they'd cook food, get food, harvest food or plant food. . .I wish that we could just go out and get our food and prepare the food. . .

### **Contemporary Adversities**

Elders described contemporary adversities as continuations of past events. They understood alcohol and drugs as rooted in history with health and social consequences. They described the introduction of alcohol as part of historical trauma and described alcohol use as a coping strategy (e.g., to deal with a spouse's death, discrimination, or not finding a job). Consequences of substance abuse mentioned by elders included family violence, children exposed to drugs and family fights, and violence among youth, including bullying and gangs. Ill health and loss of family members due to substance abuse, chronic disease, and fatal injuries were presented as contemporary adversities. The loss of relatives led to continued family separations, and loss of cultural and traditional knowledge.

Some elders talked about the poor and harsh conditions when living off the land. While they assigned high value to a subsistence lifestyle, they pointed to environmental changes that made living off the land harder. For example, one person talked about dried-up wells due to competition for water with an adjacent city.

Elders described a generational gap that contributed to youth understanding contemporary social and economic conditions out of context. They disapproved of the younger generation having lost traditions and languages, having little understanding of history and historical trauma, and having lost the value of respect. Elders seemed disappointed about the younger generation's lack of desire to experience traditional lifestyles without electricity and running water, and their loss of survival skills. Some elders did acknowledge that these changes in interests and skills were due to history not being taught, elders not wanting to talk about or relive painful experiences, and language not being taught due to boarding school experiences. The following quotations serve as illustrations:

. . .they don't understand today, their parents aren't teaching them. . . .they are not gonna have knowledge of historical trauma. . .because historical trauma wasn't taught in school. You know we learned that by experience.

. . .because when you're hurt, you don't want to go back and relive it and talk about it, take pictures of it, explain it.

A lot of the elders raised their children not to speak the Native language because of the barriers that they've faced at boarding schools.

## **Resilience**

### **Indigenous Concepts**

Elders primarily described the concept of resilience as individuals who experience hardship, but are “strong” and “able to handle it,” can “overcome,” “bounce back,” “better themselves” and “continue on.” “Strong” was the most recurrent word in the elders’ stories. A resilient person was described as a “survivor” (i.e., as “someone who made it through”). Some of the elders gave negative definitions, talking about “not getting stuck,” “not feeling sorry for yourself,” or “not giving up.” This focus on individual responsibility was presented in the context of history, spirituality, the family, and community. Some elders advised the younger generation to “know that in the past people went through a lot,” and “learn from the past and strong ancestors, and just be a strong person.” Resilience required “a good outlook on life,” being “grateful for what one had,” and “praying.” In the family context, some elders described resilience as “healing families.” Being “connected to the community,” “involved in local community cultural activities,” and “knowing one’s Native language” were resilience strategies in the context of the community. Another elder’s story demonstrated the connection between personal, family, and community resilience:

I think the values that I picked up when I was growing up was making my baskets. That was one of the things that REALLY was good for me, that I want to pass on to my children. . . .this is one of the things that I REALLY want to share. . . .I was taught by my mother and at first I didn't want to sit down and make baskets (laughter). But as I grew up, I learned that it really did help me. She . . .showed me how to prepare to make basket: first to go out and get the plants.

She also told me that. . .I have to talk to the plants. You go up to the plants while you get them, so that it will help you, strengthen you, give you the courage to go on with your life and it's really not just making baskets. It's something that, it's sort of like a sacred secret. So that's what I did. I found out that that's REALLY helped me a lot. Not just making baskets, but keeping up with our tradition, something that our people used to make and use for many things. And also, I sell my baskets a lot so that helped me in many ways. . . .that was my income when I couldn't work. . .

### **Individual Resilience**

Individual resilience was described as personal strength grounded in identity and spirituality. The elders talked about times they had exhibited strength (e.g., when herding sheep or riding horses as children, raising children while getting a degree, or knowing how to plant a garden or make baskets for income generation). The elders valued their ancestors' physical, mental, and spiritual strength. Knowing "how strong the ancestors were" and having practical skills passed down from one generation to the next were part of knowing one's identity, or "who we are." Identity meant that individual strength was tied in with family and community strength, as well as with spirituality. An individual would gain strength by being part of a supportive family and participating in the community either one on one, in a group, or working with community organizations. One elder made the connection between personal, family, and community strength by telling her story about being adopted into a non-Indigenous family but later, as an adult, taking care of AI foster children. She strengthened her own family helping foster children turn their lives around, teaching them respect through chores and teamwork, and seeing them graduate from high school. Elders also experienced connection with and support from non-Indigenous people in urban communities (e.g., the Mexican American community), and financial and motivational support for education from non-Indigenous individuals.

Personal strength was linked to practicing spirituality regardless of religious preference, by attending church or ceremonies, praying, and asking for help. Spiritual values linking generations included "thinking about and honoring those that came before," and "teaching young ones to pray." One elder stressed that, while praying was an important coping strategy, individuals still had to take responsibility for themselves. She stated:

. . .we can ask God all we want for help... You ask: “Oh God, give me the strength, give me the power, give me the wisdom.” And he says: “You’ve already got it. I gave it to you. All you’ve got to do is use it.” And we don’t listen to that. We think it’s just going to be given to us. We have to go and look for it or use what he gave us.

The Indigenous notion of personhood connected individuals to larger contexts, including family, community, spirituality and history. As described by the elders in our study, and in the literature (Kirmayer et al., 2009, 2012), the Indigenous notion of the self/person/individual is one of connectedness. Individual resilience thus must be understood as systemic in nature, because it refers to Indigenous notions of the individual that are characterized by connectedness.

### **Family Resilience**

Elders stressed the importance of family, talking about their own growing up, family support, identity, and role models. They shared childhood memories of traditions related to gardening, making a living off the land, connecting to the land, work ethic, crafts, and gender roles. Some elders talked about growing up both in cities and on farms or rural reservations. Recalling school or college, elders shared incidents of being teased or discriminated against, but also of being resilient. For example, one elder explained how his childhood memories of herding sheep helped him through school away from his family, and how his father’s professional accomplishments inspired him to complete college.

According to the elders, “strong families” were characterized by positive family relations that allowed for cooperation and togetherness, support, and child raising. Many comments focused on social support within the family and included practical support, such as teaching a professional skill or lending money, and emotional support, such as telling children to ignore name calling at school, or praying for a relative. Elders stressed the importance of families spending time together when they talked about “working as a family,” “knowing and/or being close to family members,” “eating with family,” “going on a family trip,” and “having good communication.” Some elders directly talked about family as being a strength or strategy to survive hard times. According to elders, families needed to be safe environments for children, and parents needed to protect their children in the home and in school by preventing bullying.

Elders described families in the past beyond the nuclear family and as the units where parents or relatives taught cultural knowledge, practical skills, and values, all of which contributed to the identity formation of the younger generation. All elders talked about the importance of teaching children and about how parents or other family members, such as

grandparents, used to teach an array of life skills and values. These lessons included traditional identities (e.g., language, songs and stories, gender roles, work ethic, traditional crafts, gardening, knowledge of how to use the land, respect, responsibility through chores, family relations, how to pray), workforce skills, and support for education.

In telling their stories, elders talked about people who served as role models for them, about being role models themselves, and about the importance of role models. Most elders fondly remembered their grandparents, parents, or aunts. These relatives imparted knowledge and skills, including gardening, butchering, counseling others, being medicine men, and knowing traditions around birth and death. They also were remembered for having survived adversities and for being strong, hardworking, spiritual, healthy and long lived, knowledgeable of their people's history, and an inspiration for getting a college degree. Several elders talked about serving or wanting to serve as role models for their foster children or grandchildren, and the need for youth to have elders as role models to teach them their Native language and cultural values, traditional knowledge and practices, and about historical trauma.

### **Community Resilience**

Elders reflected upon community resilience as language, culture, and tradition, but some also pointed to social, political, and economic strategies of resilience. They saw how families and individuals practicing traditional land use, spirituality, and storytelling contributed to community resilience anchored in culture and traditions. Elders noted the potential of spirituality to bring communities together in ceremonies or churches. They considered storytelling a traditional resilience strategy that connected them to their grandparents and that could connect today's youth to their history, culture, and community. One elder summarized this sentiment: ". . .to teach the next generation, go back to storytelling, sharing our stories that we know, that we remember. Teaching our language." Elders described a level of community resilience that began with families and friends getting together and creating a community characterized by social support relationships. Community allowed for mutual support and the building of long-lasting connections. In urban contexts, where the support from family members or tribal programs was missing, elders talked about the importance of finding people who could be trusted to build new connections and support relationships.

On a more structured level, elders talked about urban community resources available to both residents in general and AIs in particular. They suggested seeking help from various resources, presented here in order of frequency mentioned: Social services, including food stamps, Alcoholics Anonymous, workshops, and shelters; educational resources in form of

schools, community colleges, and The University of Arizona; and resources for AI/ANs, including local resources based on national institutions such as the Indian Health Service, the Indian Child Welfare Act, or Indian Centers. Elders stressed the TIC as an example of urban AI resilience. The Center provides an array of services for those going through hard times or new to town, and opportunities to connect, in particular for urban AI youth.

A few elders talked about the sovereignty status and resources held by tribes to provide educational funds, social services, and health programs. Elders wanted their tribal leaders, councils, and committees to advocate for their tribal members residing in urban settings.

## DISCUSSION

The life narratives of urban AI elders offer insights into resilience strategies to cope with life stressors in the context of historical trauma. Elders shared multifaceted personal stories that presented the interconnectedness between historical trauma and resilience, and revealed that traditional cultural perceptions connected the present to the past, and individuals to families and communities.

Elders defined historical trauma in the context of events that their ancestors had endured, which resulted in multiple losses. The detrimental impact of boarding schools on families and communities (i.e., separating children from their families, and interrupting traditional parenting practices and the transmission of cultural knowledge and traditions) has been described in the literature on non-urban AIs (Brave Heart, 2003; Brave Heart & DeBruyn, 1998; Goodkind et al., 2012). These researchers understood that contemporary adversities were linked to past traumatic experiences, an insight that also was observed among AI/ANs (Brave Heart & DeBruyn, 1998; Myhra, 2011) and AN elders (Wexler, 2013). Knowledge of their own and their ancestors' experiences with historical trauma and losses had left the elders with yearning for the past and admiration for their ancestors. The latter sentiment was shared by urban AI/ANs in Myhra's (2011) study that described how participants felt pride and understanding for their elders who had survived hardships. Elders described the historical trauma experienced by today's youth as "broken families," lamenting that youth did not understand historical trauma and needed to be taught about it. The generational gap observed in our study has been noted in the literature as "generational rift between elders and youth" (Goodkind et al., 2012, p. 1028), and other researchers have noted that differential understandings of culture between generations reflect a "need for more communication between generations" (Wexler, 2013, p. 17).

The elders' narratives reflected the concept of historical trauma (Brave Heart et al., 2011) by giving glimpses of their and their ancestors' lived experiences of colonization, and lived experiences of national policies and government practices aimed at assimilation. They also talked about the historical trauma response associated with unresolved historical grief as expressed in maladaptive behavior and health disparities. In elders' stories, historical trauma seemed to be linked to the experiences of each person's life in historical context; thus, the concept of historical trauma was simultaneously generic, yet fluid. As a contextualized, fluid concept, historical trauma can be understood as the lived experiences of past and present communities, families, and individuals. The importance of situating historical trauma experiences in their historical times—in line with Elder's (2001) life course approach—has been expressed by Sotero (2006).

While our study approach separated historical trauma and resilience questions, the elders' stories about historical trauma were accompanied by narratives of resilience and resilience strategies. This interweaving of historical trauma with resilience and resilience strategies is reported in the literature (Denham, 2008; Goodkind et al., 2012). Denham (2008) elaborated how narratives of trauma, in addition to their contents, were framed and told in ways that promoted resilience. Taking a "strength-based perspective" (Denham, 2008), narratives emphasized how family members had successfully overcome challenges and remained strong, thus allowing listeners to internalize strategies of current or past family members. Narratives thus portray the individual strategies of the narrators, but also transmit family and cultural strategies (Denham, 2008; Kirmayer et al., 2012).

The elders in our study shared resilience strategies at the individual, family, and community levels. Their prevailing focus on individual resilience, expressed as personal responsibility and strength, was anchored in the context of history, family, and community. Previous studies confirmed the importance of personal strength for the concept of resilience (Goodkind et al., 2012, p. 1032). The contextualized, relational selves presented by the elders were cultural constructions of personhood (Kirmayer et al., 2009, 2012) that reflected traditional AI/AN perceptions of their places in the world. These cultural perceptions of the self "situate people as part of something larger" as expressed in "feeling grounded by their connection to values, orientation, knowledge, and sustaining practices of their traditions and cultures" (Wexler, 2013, p. 14).

Elders in our study talked about Indigenous identity as community resilience when they shared their childhood and youth stories, reflecting upon cultural knowledge, language, traditional practices, spirituality, and storytelling. The central importance of Indigenous identity for community resilience has been described in the literature (Cloud Ramirez & Hammack, 2014; Fleming & Ledogar, 2008; Goodkind et al., 2012; Grandbois & Sanders, 2012). Culture and identity, as well as family support and spirituality, as sources of resilience have been stressed in studies with AI elders (Grandbois & Sanders, 2009, 2012).

Located between the individual and community levels, the families described by the elders served connecting, supporting, and identity formation functions. As described in the literature, families play important roles in transmitting “cultural identity and collective memories to their children” (Denham, 2008, p. 298). Relationships to individual family members such as grandmothers are vital in Indigenous identity formation (Cloud Ramirez & Hammack, 2014).

The elders’ narratives reflected current concepts of resilience (Goodkind et al., 2012; Grandbois & Sanders, 2012; Kirmayer et al., 2011, 2012; Kirmayer et al., 2009; Ungar, 2012a, b; Wexler, 2013). The stories described resilience as a process in which individuals acted upon adversities by accessing various resources accessible in their social, cultural, and physical contexts. These resources differed depending on time in history and locality (i.e., rural or urban). Resources were available at individual, family, and community levels, thus reflecting Ungar’s (2008, 2011, 2012a, 2012b) social ecological definition of resilience. Individual resilience strategies drew from the family system in the form of teachings and guiding relationships, and also pursued meaning, strategies, and resources from cultural resources and Indigenous identities. Elders shared Indigenous concepts of community resilience in their stories by revealing notions of personhood where individuals were connected to past family members, the land, and the environment, with a high value placed on Indigenous languages, cultures, traditions, storytelling, spirituality, and identities. Connectedness with family members—difficult to maintain in urban settings—was replaced by newly created, mostly Indigenous family relationships and friendships. By interweaving stories of historical trauma and resilience, elders demonstrated their understanding of how historical traumatic events continued to impact contemporary AI/AN communities, families, and individuals. Their urging to teach youth about history and historical trauma to help overcome historical trauma responses falls in line with the call issued by Brave Heart and colleagues (2011) to confront and understand historical trauma in preparation for the undoing and final transcending of unresolved grief.

Based on our understanding of the elders' stories, and supported by the literature on historical trauma and resilience, we introduce a strength-based explanatory model to illustrate that narratives link resilience with historical trauma (See Appendix B, Figure 1). Both historical trauma and resilience are made up of multiple levels, whereby the historical trauma and resilience of individuals are connected to the historical trauma and resilience of families and communities. Our conceptualization of resilience as taking a social ecological approach is supported in the literature (Grandbois & Sanders, 2012; Kirmayer et al., 2011, 2012; Kirmayer et al., 2009; Sotero, 2006; Ungar, 2008, 2012a, 2012b). Our model shows how both historical trauma and resilience are embedded in specific historical times (based on Myhra, 2011) which results in flexible perceptions of historical trauma and resilience. We visualize the continuity of both historical trauma and resilience, indicating how current and future generations can learn about historical trauma and prevent it from having continued negative impacts by engaging proactively in resilience strategies passed down through generations.

## Limitations

The aim of this qualitative study was to understand, not to generalize. Our understanding of urban AI elders' resilience strategies to cope with life stressors and historical trauma was intended to inform the development of a health promotion curriculum for urban youth and their families. In addition, the study's findings also can contribute to theory development (Patton, 2002)—in this case, theories of AI resilience.

One limitation is that we did not analyze the elders' narratives in the context of specific tribal affiliations. By not doing so, we may have overlooked specific tribal experiences and resilience strategies. We also acknowledge the limitation of segmenting the elders' rich stories to discover themes and patterns without recounting the full stories. Our analysis employed Western-based qualitative analysis methods, while Indigenous approaches may have yielded different results. Finally, our study and manuscript work with complex concepts such as "culture" without offering critical definitions. To illustrate this point, it should be noted that, while "culture" can be supportive of resilience (Wexler, 2013), it also can have the opposite effect. For example, in their long-term, multidisciplinary study, Panter-Brick & Eggerman (2012) found that Afghan youth experienced cultural values both as protective resources that fostered resilience, and as causes of distress and suffering. Afghan youth strove to obtain the

cultural value of a good education to overcome poverty; however, they also had to fulfill cultural expectations (e.g., marriage for girls, providing for the family for boys) that interfered with their education, thus curtailing an essential resilience strategy.

### **Implications for Public Health**

Public health needs to prioritize participatory, strength-based approaches to health promotion in AI communities. Resilience interventions with a social ecological approach are grounded in local knowledge, values, and practices. They have the potential to support the immediate and long-term well-being of individuals, families, and communities. Our study and existing literature suggest that resilience and resilience strategies need to be addressed in the path of transcending historical trauma, as called for by Brave Heart et al. (2011).

As contemporary adversities of AI/ANs result from historical trauma experiences and continued discrimination, interventions need to take “a long-term approach to rebuild, repair and revitalize community strengths and institutions” (Kirmayer, Sehdev, Whitley, Dandeneau, & Isaac, 2009, p. 63) with a specific focus on community resilience. This focus on community interventions within an ecological framework has the potential to both address the underlying causes of contemporary adversities and “change social and economic policies and current distributions of power”—for example, at tribal, state, and federal levels (Goodkind et al., 2012). Kirmayer and colleagues (2009) already suggested types of interventions with examples to promote community resilience. The importance of community healing, along with individual and family healing, has been stressed in early research on AI/AN historical trauma (Brave Heart & DeBruyn, 1998). Indigenous ceremonies, including healing ceremonies, are concrete examples of community resilience strategies (Brave Heart, 2003; Brave Heart & DeBruyn 1998). Culturally based community resilience interventions, however, can only occur in close collaboration and consultation with local community members, as the same cultural practices (e.g., language or spiritual traditions) that promote resilience may have been lost or nearly lost in the past due to forced assimilation. Knowing what cultural knowledge, values, and practices can and should be practiced or brought back will be key.

While historical trauma and resilience as lived experience may differ for each generation, strategies of resilience employed by earlier generations may be adopted by current generations. Contemporary identities need to be negotiated between generations. Nurturing mutual

understanding and respect for what generations endure is a foundation for building resilience and breaking the cycle of historical trauma. Future studies should continue with intergenerational research among AIs, as exemplified by Wexler's (2013) work with ANs.

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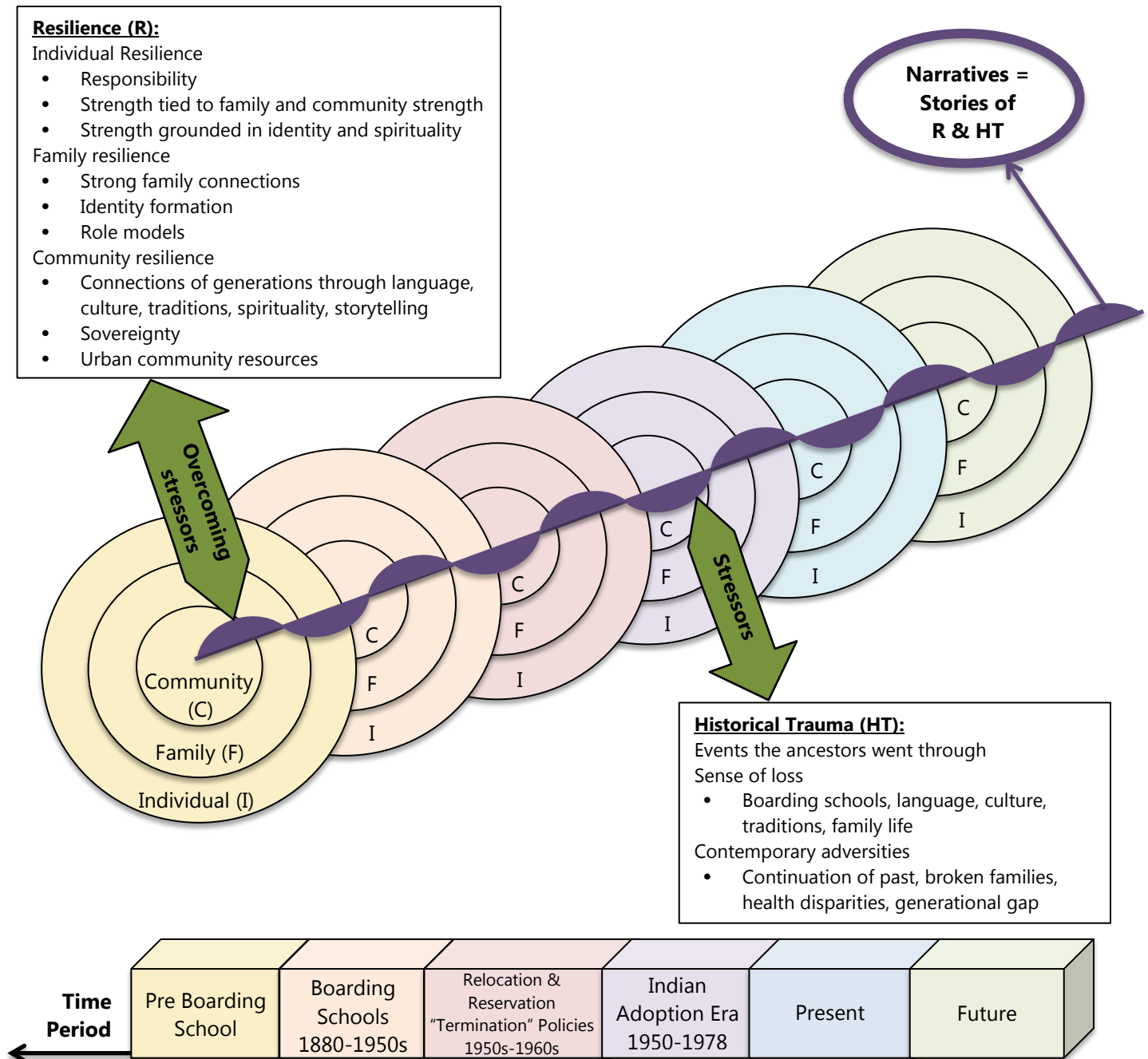
## APPENDIX A

**Table 1**  
**Coding Book**

Themes	Patterns
<b>Category I: Historical Trauma</b>	
<u>Indigenous concepts</u>	
Sense of loss	boarding school, broken families, loss of language, loss of traditions, removal from family, removal from land, yearning
Adversities	alcoholism/drugs, discrimination, generational gap, ill health, living conditions, loss of family member, lost voice, violence
<b>Category II: Resilience</b>	
<u>Indigenous concepts</u>	
Individual	know roots, participation, practicing spirituality, responsibility, strength, volunteerism
Family	family members as role models, growing up, positive family relations, safe environment for kids, teaching children
Community	culture/traditions/language, economic development, other community resources, sharing stories, sovereignty, spirituality, TIC, traditional land use
Youth	activities, education, get elders and youth together, know roots/know history

## APPENDIX B

**Figure 1**  
**Stories of Resilience Model**



# **SUICIDAL IDEATION IN AMERICAN INDIAN/ALASKA NATIVE AND WHITE ADOLESCENTS: THE ROLE OF SOCIAL ISOLATION, EXPOSURE TO SUICIDE, AND OVERWEIGHT**

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*Abstract: Social isolation, exposure to suicide, and overweight increase suicidal ideation in adolescents, but no study to date has examined their relative significance in American Indian and Alaska Native (AI/AN) youth. Generalized estimating equations and path analyses were used to measure the significance and mediation of these variables in the suicidal ideation of 721 AI/ANs and 12,107 White adolescents. Social isolation, exposure to suicide, and overweight were risk factors for suicidal ideation in both races, and the associations among the variables of interest and suicidal ideation varied by race. Interventionists need to consider race in the prevention of suicidal ideation in AI/AN and White youth.*

## **INTRODUCTION**

The U.S. Surgeon General's 2012 National Strategy for Suicide Prevention called for "effective programs and practices that increase protection from suicide risk" (Story et al., 2012). In the United States, suicide costs \$34.6 billion annually (Corso, Mercy, Simon, Finkelstein, & Miller, 2007), and many suicide risk factors disproportionately affect AI/ANs (Gracey & King, 2009; King, Smith, & Gracey, 2009). The largest disparities in suicide attempts and mortality between AI/ANs and Whites are observed in adolescence (Centers for Disease Control and Prevention [CDC] & National Center for Injury Prevention and Control, 2012). Fifteen percent of American Indian and Alaska Native (AI/AN) adolescents have attempted suicide, compared to 6% of non-Hispanic Whites (hereafter Whites; CDC, 2012). Even more worrisome, deaths by suicide are twice as prevalent in AI/AN adolescents (20.7 per 100,000 people) than in Whites (8.9; CDC & National Center for Injury Prevention and Control, 2012). Suicide rates in AI/ANs vary significantly by tribal

community (Herne, Bartholomew, & Weahkee, 2014), but racial disparities in attempted suicide, as well as death by suicide, have remained stable for the last three decades (Gone & Trimble, 2012). Consequently, the Indian Health Service (2011) has made adolescent suicide a high priority for research, intervention, and prevention.

Recent reviews of the literature have identified risk factors for adolescent suicide at the individual, family, community, and societal levels (Asarnow & Miranda, 2014; Brent, 1995; Gould, Greenberg, Velting, & Shaffer, 2003; Joiner, Brown, & Wingate, 2005; Katz et al., 2013). Research in AI/ANs has long recognized the significance of social connectedness, or social isolation, as well as individual exposure to suicide (Borowsky, Resnick, Ireland, & Blum, 1999; Chino & Fullerton-Gleason, 2006; Grossman, Milligan, & Deyo, 1991; Hill, 2009; Lester, 1995; Manson, Beals, Dick, & Duclos, 1989; O'Keefe & Wingate, 2013; Pharris, Resnick, & Blum, 1997; Tingey et al., 2014). Previous studies have approached social isolation from the perspectives of alienation, hopelessness, and lacking a sense of belonging (Chino & Fullerton-Gleason, 2006; Grossman et al., 1991; Hill, 2009; Lester, 1995; O'Keefe & Wingate, 2013; Pharris et al., 1997), but the core argument is the same: Social isolation drives suicide. A second group of studies has regarded adolescent suicide as a product of exposure to suicidal behavior in others, especially relatives and friends (Borowsky et al., 1999; Grossman et al., 1991; Manson et al., 1989; Tingey et al., 2014). While previous studies have shown the relevance of social isolation and exposure to suicide as causative factors in regional samples of AI/ANs (Borowsky et al., 1999; Chino & Fullerton-Gleason, 2006; Grossman et al., 1991; Hill, 2009; Lester, 1995; Manson et al., 1989; O'Keefe & Wingate, 2013; Pharris et al., 1997; Tingey et al., 2014), no population-based study has examined risk factors for suicidal ideation in AI/AN and White adolescents.

An emerging line of inquiry suggests that overweight might be another risk factor for adolescent suicide (Eaton, Lowry, Brener, Galuska, & Crosby, 2005; Swahn et al., 2009; Zeller, Reiter-Purtill, Jenkins, & Ratcliff, 2013). This hypothesis is especially relevant for AI/ANs, because they have a high prevalence of overweight and obesity (Anderson & Whitaker, 2009; Lau, Lin, & Flores, 2012). To date, no study has examined the relative significance of social isolation, exposure to suicide, and overweight in the suicidal ideation of AI/AN and White adolescents. The present study addresses these gaps by estimating the relative contribution of these three risk factors with data from a population-based sample. Our goals were to: 1) compare the magnitude and statistical significance of the coefficients for social isolation, exposure, and overweight in AI/ANs and Whites;

2) examine mediating factors in the associations among these three variables and suicidal ideation; and 3) assess the extent to which the associations among these variables and suicidal ideation vary by race.

## METHODS

### Study Sample

We conducted a retrospective cohort study with data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), a nationally representative survey of adolescents and young adults in the U.S. conducted by the University of North Carolina-Chapel Hill. Add Health respondents were recruited from schools and followed for four waves: 1994, 1996, 2002, and 2008. Schools were eligible to participate if they had an 11th grade class and a minimum of 30 students enrolled. Additionally, Add Health conducted in-home questionnaires with all respondents from the school sample, as well as selected oversampled communities. Full details on Add Health survey and sampling methods have been published previously (Harris & Udry, 2014). For this study, we used data from Wave 1 (1994), when all respondents were 11-20 years old. We limited our analyses to respondents who self-identified as AI/AN or White, and self-reported height and weight for calculation of body mass index (BMI). The resulting sample included 721 AI/ANs and 12,107 Whites. Our study was exempt from ethical review because it used only deidentified data.

### Measures

#### Outcome

*Suicidal ideation* was measured with the question: “During the past 12 months, did you ever seriously think about committing suicide?” We used the original response categories (yes, no).

#### Variables of interest

*Social isolation* was measured by the degree of agreement or disagreement with the statements: “I feel socially accepted” and “I feel like I am part of this school.” Possible responses were *Strongly agree*, *Agree*, *Neither agree nor disagree*, *Disagree*, and *Strongly disagree*. We coded responses dichotomously, assigning 1 to “Disagree” or “Strongly disagree” and 0 to all other options.

*Exposure to suicide* through friends and family was measured with the following dichotomous questions: “Have any of your friends tried to kill themselves during the past 12 months?” and “Have any of your family tried to kill themselves during the past 12 months?” We used the original response categories (yes, no).

*Overweight* was calculated by using self-reported height and weight. Respondents with BMI above the 85th percentile (CDC, 2000) were categorized as overweight (yes, no).

### **Covariates**

We adjusted all models for age, sex, and race. Age was coded as a continuous variable, while sex (male, female) and race (White, AI/AN) were coded categorically.

### **Statistical Analyses**

Social isolation, exposure to suicide, and overweight were our variables of interest. Generalized estimating equations were fitted to model the associations among these variables and suicidal ideation, adjusting for age, sex, and race. Model 1 estimated the effects of age, sex, and AI/AN race on suicidal ideation. Model 2 assessed the association between overweight and suicidal ideation, controlling for age, sex, and AI/AN race. Model 3 included two variables to measure the role of previous exposure to suicide through friends and family, and Model 4 included two additional variables to estimate the relative significance of social isolation, exposure to suicide, and overweight in suicidal ideation. Regression models were conducted with R (R Development Core Team, 2010).

Structural equation modeling was used to determine whether social isolation mediated the relationship of exposure and overweight with suicidal ideation. For the path analyses, items were combined for exposure (*friend and/or family member attempted suicide*) and social isolation (*socially unaccepted* and/or *not part of school*) resulting in dichotomous manifest predictor and mediating variables. The path model was stratified by race, and we controlled for age and sex by including them as covariates in the analyses. Mplus Version 7.11 (Muthén & Muthén, 1998-2010) was used for path analyses. Due to the binary nature of the data, model fit is demonstrated with the sample-size adjusted Bayesian Information Criteria (BIC) for each model (Muthén & Muthén, 1998-2010). BIC is a predictive fit index that takes into account sample size and model complexity (Kline, 2005). Robust maximum likelihood estimation was utilized for the pathanalyses and, therefore, logistic regressions were estimated (Muthén & Muthén, 1998-2010), resulting in odds ratios (OR). All results are reported in OR, 95% confidence intervals (CI), and *p* values (*p*), with *p* < 0.05 considered statistically significant.

## RESULTS

### Descriptive Statistics

We used proportions, means, and standard deviations to describe the characteristics of the study sample (Table 1). We followed the recommendations of a recent publication (Cummings & Rivara, 2003), and decided not to include *p* values in Table 1. AI/ANs and Whites had an average age of 15 years, and females comprised approximately 50% of the sample. The average BMI for AI/ANs was 23.4 (*SD* = 5.2), and 36% were overweight or obese. The average BMI for Whites was 22.3 (*SD* = 4.3), and 27% were overweight or obese. The prevalence of social isolation was similar in both groups, but AI/ANs reported more exposure to suicide than Whites through relatives (7% vs. 5%) and friends (26% vs. 19%). AI/ANs also reported a higher prevalence of suicidal ideation than Whites (17% vs. 14%).

**Table 1**  
**Characteristics of Study Participants Stratified by Race<sup>a</sup>**

	<b>AI/ANs (<i>N</i> = 721)</b>	<b>Whites (<i>N</i> = 12,107)</b>
	<b><i>SD</i></b>	<b><i>SD</i></b>
Age in years; mean	15.0 (1.7)	15.1 (1.7)
BMI; mean	23.4 (5.2)	22.3 (4.3)
	<b><i>n</i> (%)</b>	<b><i>n</i> (%)</b>
Female	377 (52.3)	6,026 (49.8)
Overweight (BMI ≥ 85th percentile)	257 (35.6)	3,322 (27.4)
Feels not socially accepted	54 (7.5)	874 (7.2)
Feels not part of the school	83 (11.5)	1,487 (12.3)
Friend attempted suicide	187 (25.9)	2,258 (18.7)
Relative attempted suicide	48 (6.7)	540 (4.5)
Suicidal ideation	124 (17.2)	1,652 (13.6)

<sup>a</sup> Source: National Longitudinal Study of Adolescent to Adult Health, Wave 1.

### Three Explanations for Suicidal Ideation

AI/AN race was associated with an increased risk of suicidal ideation by 31% (OR = 1.31; CI = 1.08, 1.60; *p* < 0.01), controlling for age and sex (Table 2). Overweight adolescents were 19% more likely to think about suicide than those with a normal BMI (OR = 1.19; CI = 1.07, 1.33; *p* < 0.01; Table 2, Model 2). Previous exposure to suicide through relatives and friends multiplied the odds of suicidal ideation by factors of two (OR = 2.23; CI = 1.84, 2.72; *p* < 0.01) and three (OR =

3.01; CI = 2.69, 3.37;  $p < 0.01$ ), respectively (Table 2, Model 3). After adjusting for exposure to suicide, overweight maintained a statistically significant association with suicidal ideation (OR = 1.14; CI = 1.01, 1.28;  $p = 0.028$ ), but AI/AN race did not (Table 2, Model 3).

**Table 2**  
**Role of Overweight, Exposure to Suicide, and Social Isolation**  
**in the Suicidal Ideation of AI/AN and White Adolescents<sup>a</sup>**

	Model 1				Model 2				Model 3				Model 4			
	OR	95% CI		<i>p</i>	OR	95% CI		<i>p</i>	OR	95% CI		<i>P</i>	OR	95% CI		<i>p</i>
Age	1.06	1.03	1.09	<0.001	1.06	1.03	1.09	<0.001	1.07	1.04	1.10	<0.001	1.06	1.03	1.10	<0.001
Female	1.67	1.50	1.85	<0.001	1.69	1.52	1.88	<0.001	1.47	1.32	1.63	<0.001	1.45	1.30	1.62	<0.001
AI/AN	1.31	1.08	1.60	0.007	1.29	1.06	1.57	0.010	1.17	0.96	1.44	0.122	1.18	0.97	1.45	0.105
Overweight					1.19	1.07	1.33	0.002	1.14	1.01	1.28	0.028	1.12	1.00	1.26	0.050
Friend attempted suicide									3.01	2.69	3.37	<0.001	2.92	2.60	3.20	<0.001
Relative attempted suicide									2.23	1.84	2.72	<0.001	2.24	1.84	2.72	<0.001
Feels not socially accepted													2.03	1.68	2.45	<0.001
Feels not part of the school													1.33	1.14	1.57	<0.001

<sup>a</sup> Source: National Longitudinal Study of Adolescent to Adult Health, Wave 1. Generalized Estimating Equations were used to estimate the associations between the variables of interest and suicidal ideation.

When we estimated the relative significance of the three risk factors for suicidal ideation, we observed that previous exposure to suicide through friends had the largest effect (Table 2, Model 4). Adolescents with a friend who had attempted suicide were almost three times more likely to think about suicide than those without such exposure (OR = 2.92; CI = 2.60, 3.20;  $p < 0.01$ ). Similarly, exposure to suicide through relatives doubled the odds of suicidal ideation (OR = 2.24; CI = 1.84, 2.72;  $p < 0.01$ ), as did social isolation (Table 2, Model 4). Respondents who did not feel socially accepted were twice as likely to report suicidal ideation as those who felt socially accepted (OR = 2.03; CI = 1.68, 2.45;  $p < 0.01$ ), and respondents who did not feel part of their schools were 33% more likely to report suicidal ideation than their counterparts (OR = 1.33; CI = 1.14, 1.57;  $p < 0.01$ ; Table 2, Model 4). Overweight increased the odds of suicidal ideation by 12% (OR = 1.12; CI = 1.00, 1.26;  $p = 0.050$ ), even after controlling for social isolation and exposure to suicide (Table 2, Model 4).

### Path Analysis

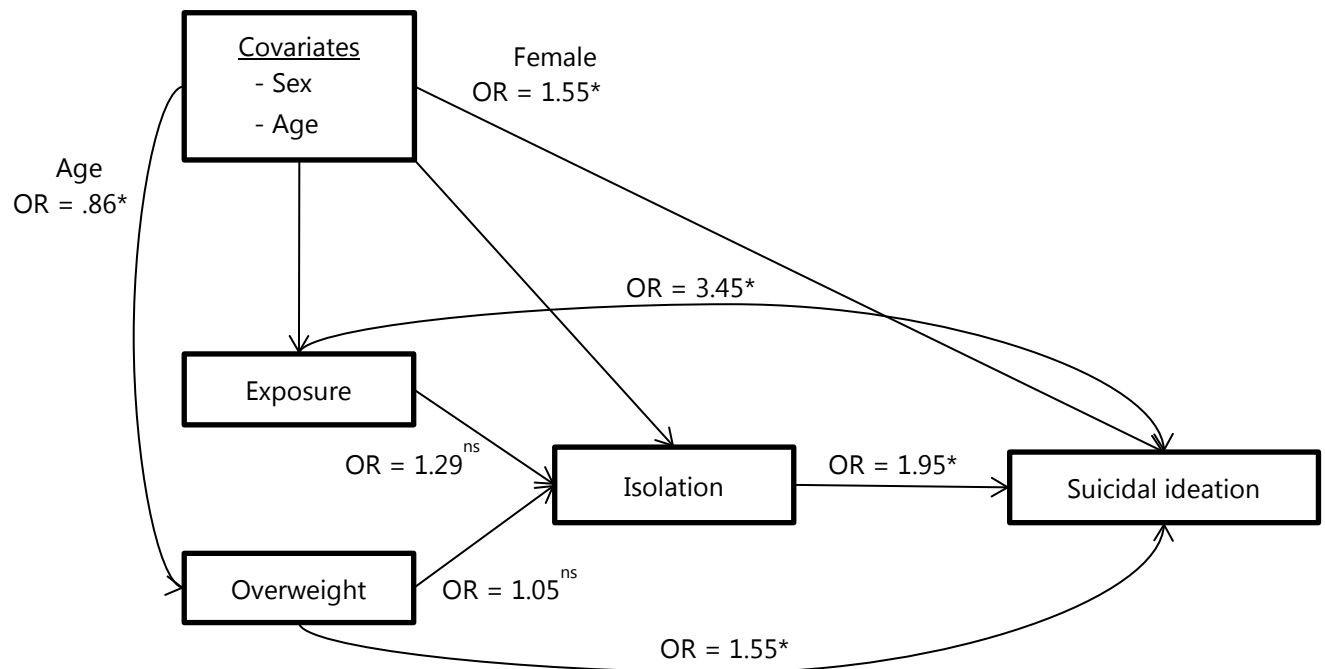
We stratified our models by race to determine whether the associations among the variables of interest were consistent in both samples. To measure the effects of exposure to suicide and social isolation, we selected the variables with the strongest effects in Table 2, Model 4; friend attempted suicide (exposure) and feels not socially accepted (isolation). Path analysis for AI/AN participants ( $BIC = 3,056.16$ ) showed that exposure to suicide was not related to social isolation ( $OR = 1.29$ ;  $CI = 0.83, 2.03$ ;  $p = 0.257$ ), nor was overweight ( $OR = 1.05$ ;  $CI = 0.69, 1.60$ ;  $p = 0.829$ ). However, social isolation ( $OR = 1.95$ ;  $CI = 1.18, 3.24$ ;  $p < 0.01$ ), exposure to suicide ( $OR = 3.45$ ;  $CI = 2.30, 5.19$ ;  $p < 0.01$ ), and overweight ( $OR = 1.55$ ;  $CI = 1.02, 2.35$ ;  $p = 0.039$ ) were all related to suicidal ideation, without mediation. For AI/ANs, the three variables of interest were associated with suicidal ideation, but they were not related to one another (Figure 1).

Path analysis for White participants ( $BIC = 45,464.98$ ) showed a distinctive pattern. Exposure to suicide was related to social isolation ( $OR = 1.63$ ;  $CI = 1.46, 1.83$ ;  $p < 0.01$ ), as was overweight ( $OR = 1.14$ ;  $CI = 1.02, 1.28$ ;  $p = 0.021$ ). In turn, social isolation was directly related to suicidal ideation ( $OR = 1.90$ ;  $CI = 1.67, 2.17$ ;  $p < 0.01$ ). Exposure to suicide was also directly related to suicidal ideation ( $OR = 3.30$ ;  $CI = 2.95, 3.69$ ;  $p < 0.01$ ), but overweight was not ( $OR = 1.11$ ;  $CI = 0.98, 1.25$ ;  $p = 0.101$ ). For Whites, social isolation partially mediated the relationship between exposure and suicidal ideation, and fully mediated the relationship between overweight and suicidal ideation (Figure 2).

## DISCUSSION

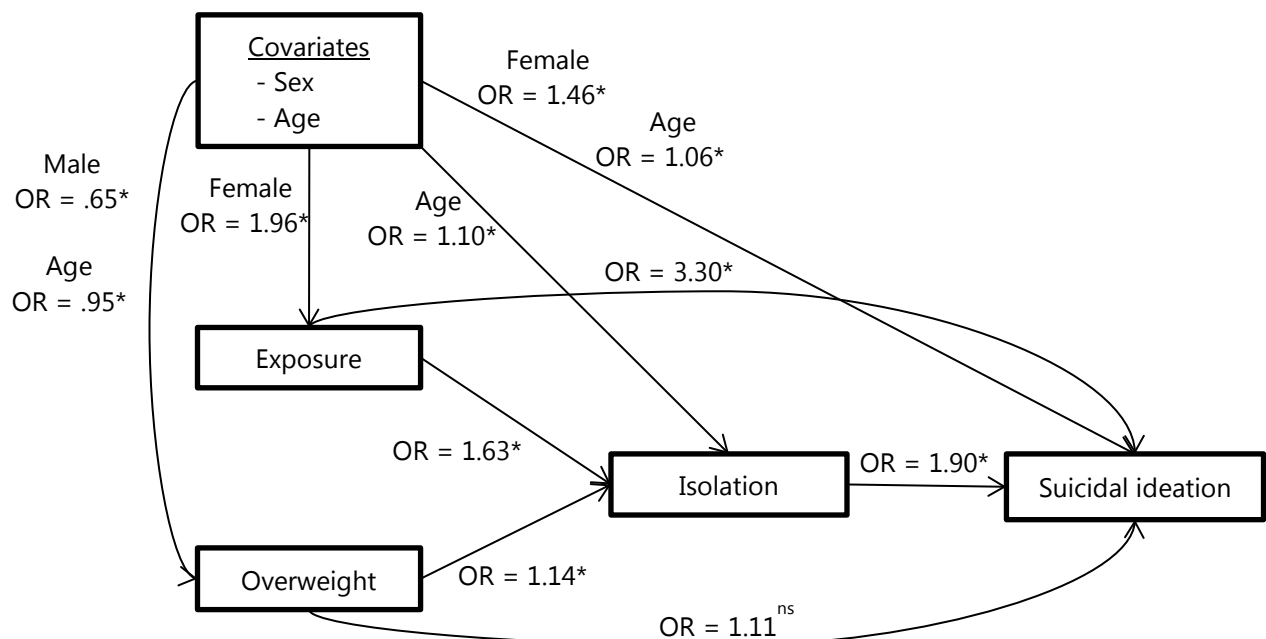
A retrospective cohort study with data from Add Health allowed us to estimate the relative significance of social isolation, exposure to suicide, and overweight in the suicidal ideation of AI/ANs and Whites ages 11-20 years. All three variables were associated with increasing suicidal ideation in both races, but the associations between these variables varied by race. Exposure to suicide through friends had the strongest effect on suicidal ideation, as respondents with friends who attempted suicide were three times more likely to exhibit suicidal ideation than those without such exposure. Path analyses showed that social isolation mediated the effects of exposure and overweight in Whites, but not in AI/ANs. In AI/ANs, we observed that all three variables maintained statistically significant associations with suicidal ideation, without mediation.

**Figure 1**  
**Path Model of Mediation by Social Isolation with Covariates for the AI/AN Sample (N = 721)<sup>a</sup>**



<sup>a</sup> Source: National Longitudinal Study of Adolescent to Adult Health, Wave 1. Odds ratios (OR) are reported for each path. For presentation purposes, only statistically significant covariate paths are reported.  
 \*  $p < 0.05$

**Figure 2**  
**Path Model of Mediation by Social Isolation with Covariates for the White Sample (N = 12,107)<sup>a</sup>**



<sup>a</sup> Source: National Longitudinal Study of Adolescent to Adult Health, Wave 1. Odds ratios (OR) are reported for each path. For presentation purposes, only statistically significant covariate paths are reported.  
 \*  $p < 0.05$

This is the first population-based study to estimate the relative significance of three risk factors for suicidal ideation in AI/ANs and Whites. Our results are consistent with previous studies reporting the significance of social isolation and exposure to suicide in the suicidal ideation of AI/AN youth (Borowsky et al., 1999; Chino & Fullerton-Gleason, 2006; Grossman et al., 1991; Hill, 2009; Lester, 1995; Manson et al., 1989; O’Keefe & Wingate, 2013; Pharris et al., 1997; Tingey et al., 2014). A study of 204 boarding school students from Southeastern AI/AN tribes found that exposure to suicide through friends and family, as well as depression, limited social support by family, and high levels of social support by peers, were all associated with increased suicidality (Manson et al., 1989). The White Mountain Apache Tribe developed the first suicide surveillance system in Indian country, in collaboration with the Johns Hopkins University, and showed promising results (Cwik et al., 2014). This system found that most Apache adolescents who attempted suicide visited the Emergency Department (ED) one year prior to their attempt (Ballard et al., 2014). Thus, EDs might be key units to screen for suicidal ideation and prevent suicide in adolescents. Further research is needed to clarify the effectiveness of prevention strategies over the life course, and across tribal communities.

Our results also are consistent with research reporting that excessive weight in adolescence is a risk factor for suicidal ideation. Previous research has found that adolescents who were overweight or obese, and perceived their weight accurately, were more likely to report suicidal ideation than were their normal-weight peers and their overweight peers who perceived their weight inaccurately (Eaton et al., 2005; Swahn et al., 2009; Zeller et al., 2013). Our dataset did not include weight perception variables, but our results provide evidence of the link between adolescent overweight and suicidal ideation. Overweight and obesity prevention programs are expected to help prevent suicide in adolescence.

Further research is needed to clarify the etiologies of suicidal ideation and its variability by race. The different prevalence of overweight and exposure to suicide in AI/ANs and Whites could be explaining the results of our path analyses. Because of the relatively high prevalence of overweight and suicide in tribal communities (Alcantara & Gone, 2007; Holm, Vogeltanz-Holm, Poltavski, & McDonald, 2010), overweight or exposure to suicide are not associated with social isolation in AI/ANs, but these variables are associated with social isolation in Whites. This hypothesis is consistent with a recent study finding that Whites experience stronger patterns of weight discrimination than do racial minorities (Dutton et al., 2014), even though AI/ANs were not represented in the study sample.

Further research is also needed to test alternative explanations for suicidal ideation, based on mental health conditions, substance use disorders, childhood abuse, and firearm ownership. Recent reviews of the literature have emphasized the importance of these factors (Asarnow & Miranda, 2014; Brent, 1995; Gould et al., 2003; Joiner et al., 2005; Katz et al., 2013), but Add Health did not include measures adequate for inclusion in our analysis. Anthropological research is needed to explain persistent differences in suicidality between AI/ANs and Whites. Perhaps Native cultures encompass distinctive understandings of suicide [and overweight] that influence suicidal ideation in ways that we could not capture with available survey data. Retrieving such cultural knowledge could inform the development and cultural tailoring of interventions to prevent suicide in tribal communities. Thus, we encourage researchers, clinicians, and interventionists to replace traditional linear approaches to suicide prevention with more textured models.

This study has four main limitations. First, variables estimating social isolation, exposure to suicide, overweight, and suicidal ideation were measured by self-report. Social desirability might have encouraged participants to underreport these factors (Larson, 2000; Miotto & Preti, 2008). Second, we did not distinguish between youth who were overweight and those who were obese, or between those who had thought about suicide and those who had made a suicide attempt. Although these distinctions might be informative, we chose not to include them because the number of respondents in each subgroup was extremely small. To offer a broad public health message, we decided to focus on conditions affecting a large percentage of the adolescent population. Third, our dataset was collected in 1994, and these are the most recent data to answer our research question. This limitation is important, because the obesity landscape and the nature of adolescent communication have changed since 1994. We are not aware of any other nationally representative dataset with adequate variables to examine the role of social isolation, exposure to suicide, and overweight in the suicidal ideation of AI/AN and White adolescents. Racial disparities in adolescent suicide have been stable for the last three decades (Gone & Trimble, 2012), and new datasets are needed to continue studying adolescent suicide across racial and ethnic groups. Fourth, Add Health did not oversample AI/ANs, so the AI/AN respondents do not comprise a truly nationally representative sample of tribal communities. Although Add Health provided nationally representative data of AI/ANs and Whites, it was not designed to capture the heterogeneity of each racial category (Israel, Schulz, Parker, & Becker, 1998). Larger datasets with systematic oversampling of AI/ANs are needed to capture the heterogeneity within each racial group.

## CONCLUSION

This population-based study contributes to the literature on adolescent suicide by detailing the relationships among social isolation, exposure to suicide, overweight, and suicidal ideation in AI/ANs and Whites. Results show that all risk factors are related to suicidal ideation in both groups, but their interrelationships differ by race. Further research is needed to clarify etiologies of suicidal ideation in adolescence, as well as the long-term consequences of adolescent social isolation, exposure to suicide, and overweight in adulthood. Meanwhile, we encourage public health organizations, researchers, and community advocates interested in adolescent health, health disparities, and suicide to work together on intervention strategies that can successfully address suicide risk in AI/AN and White youth.

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