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PREVALENCE OF MAJOR STRESSFUL LIFE EVENTS AND MENTAL HEALTH SYMPTOMS OF AMERICAN INDIAN AND ALASKA NATIVE ADOLESCENTS IN HAWAI‘I

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Abstract: While progress has been made in learning more about American Indians and Alaska Natives (AI/ANs) who reside in Hawai‘i, much more research is needed regarding adolescents’ mental health and the major life events that they encounter. Utilizing a large cross-sequential epidemiologic design (N = 7,214; 1992-1996), this study found AI/AN-Hawaiian youth self-reported higher risk of predominantly negative major life events and mental health symptoms than for the non-Indigenous adolescent ethnic group, with the AI/AN and Native Hawaiian ethnic groups falling generally in between. However, when statistically controlling for covariates, overall, Native Hawaiian youth self-reported higher mental-health-symptom risk than the other three ethnic groups. Implications are discussed, including protective factors, prevention, and future research.

INTRODUCTION

Nationally

In the United States, American Indian and Alaska Native (AI/AN) adolescents represent one of the most diverse and fastest-growing populations (Center for Native American Youth, 2016). Much has been written on the mental and behavioral health of AI/AN youth (American Psychiatric Association [APA], 2017; Gone & Trimble, 2012; Goodkind et al., 2010; Sarche, Spicer, Farrell, & Fitzgerald, 2011; Whitbeck, Walls, & Hartshorn, 2014). In addition to setting the foundation for intervention and future research, one conclusion has been that protective factors for AI/AN adolescents include enduring spirit, adaptability, resiliency, culture’s supportive role (e.g., strong cultural identification), connections with the past, traditional health practices, pro-social networks as adolescents mature (e.g., family, elders’ wisdom), and positive life events (APA, 2017; Center for Native American Youth, 2016; Whitbeck et al., 2014).

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Countering these protective factors have been risk factors, such as socioeconomic, demographic, and physical and mental health disparities (e.g., poverty, unemployment, low educational attainment, infant mortality, violence, substance use, mood and anxiety disorders, suicide, and comorbidity/dual diagnosis; American Indian and Alaska Native Mental Health Research, 1994; APA, 2017; Center for Native American Youth, 2016; Gone & Trimble, 2012; Goodkind et al., 2010; Sarche et al., 2011).

Many of these risk factors can be conceptualized as stressful or negative life events. Chen (2003) found that 95% of the AI/AN adolescents who were surveyed self-reported at least one of 11 negative life events. This study was also the only one to compare the prevalence of negative life events across groups, whereby it was found that upper-midwest AI/AN 5th- to 8th-grade adolescents had higher self-reported rates, compared to rural Iowa 7th-grade adolescents on 7 of 10 negative life events (i.e., moved, close relative died, pet died, close friend moved away, failed in class, seriously injured, family member victim of crime).

Based on an AI/AN youth literature review, negative life events were found to be robustly associated with higher levels of mental health symptoms, substance use, and diagnosable psychopathology (Bechtold, Manson, & Shore, 1994), as well as a host of other risk factors, including violence exposure and victimization, trauma, injury, education-related problems, suicidality, and family and peer difficulties (Arizala, 2011; Baldwin, Brown, Wayment, Nez, & Brelsford, 2011; Burnette & Figley, 2015; Chen, 2003; Dinges & Duong-Tran, 1993; King, Beals, Manson, & Trimble, 1992; Novins & Mitchell, 1998; O'Connell et al., 2007; Office of Technology Assessment, 1990; Soto, Baezconde-Garbanati, Schwartz, & Unger, 2015; Whitesell et al., 2009).

Therefore, gaps in the literature include only minimal research conducted on the prevalence of negative life events for AI/AN youth in contrast to non-AI/AN groups, and although the risk literature found robust associations between stressful life events and substance use and depression, minimal research was found on the association between stressful life events and anxiety and conduct problems.

Hawai‘i

Although individuals of AI/AN ancestry constitute only a small percentage of Hawai‘i's population (0.3% full AI/AN, U.S. Census Bureau, 2000; 31,052 or 2.2% mixed AI/AN, U.S. Census Bureau, 2011-2013), there are important reasons to study AI/ANs in Hawai‘i. To start, not much is known about AI/AN adolescents who reside in Hawai‘i. Based on a literature review, there was only

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one study that primarily focused on AI/ANs in Hawai'i and their behavioral health (i.e., Munnelly, Hishinuma, Lee, Smith, & McCarthy, 2018), despite there being great concern in the scientific literature on the disparities experienced by Native Hawaiians—the indigenous people of the Hawaiian Islands (e.g., lower socioeconomic status, poorer mental health; Andrade et al., 2006; Choi-Misailidis & Kaulukukui, 2004; Kamehameha Schools, 2014; Office of Hawaiian Affairs, 2015). Additionally, AI/ANs who reside in Hawai'i may be further removed from protective cultural and tribal attachments. Also, gaining knowledge of the similarities and differences between the two indigenous cultures of Native Hawaiians and AI/ANs may be invaluable in improving the mental and behavioral health of AI/ANs in Hawai'i and the continental United States via potential generalizations and adaptations in knowledge and practice (Munnelly et al., 2018).

There have been only three major empirical efforts that included the behavioral health of AI/AN adolescents in Hawai'i. First, as extrapolated by Munnelly et al. (2018) from the U.S. Census (2011-2013), a much higher percent of AI/ANs in Hawai'i was of mixed ancestry (90.5%) as compared to the mixed ethnicity percent of the entire Hawai'i population (23.6%). This pattern of difference was also true for the United States as a whole, where 51.1% of AI/ANs was of mixed ancestry compared to only 2.8% of the entire U.S. population. In addition, AI/ANs (mixed or full) in Hawai'i and the United States were comprised of a larger proportion of children and adolescents compared to the general population, and there was a trend of lower socioeconomic status, including (1) higher percentage of grandparents who were responsible for grandchildren; (2) higher proportion of families who had children in poverty; (3) higher rate of individuals 16 years of age or over who were unemployed; (4) lower household median income; (5) lower percent with health insurance; and (6) lower proportion who completed a college or professional degree. In addition, AI/ANs in both the United States and in Hawai'i had a slightly higher rate of being civilian veterans as compared to their respective populations. The only inconsistent result was AI/ANs of one or more ancestries in Hawai'i had a smaller average family size than Hawai'i's population, but the converse was true for the U.S. population. Unfortunately, the U.S. Census data did not include important factors (e.g., academic, social, physical and mental health, cultural identification) on an individual level.

Second, Hishinuma et al. (2005) examined violence victimization (defined as an individual who "was a victim of violence [was physically harmed by someone]") for adolescents, their family members, and their close friends within the past six months (Major Life Events Scale; Andrews, Lewinsohn, Hops, & Roberts, 1993). This study utilized the large 1992-1996 epidemiologic data from the National Center on Indigenous Hawaiian Behavioral Health (formerly, Native Hawaiian

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Mental Health Research Development Program). The overall rate of being a victim of violence for part-full AI/ANs was 4.4% (compared to 3.2% for all others; difference not statistically significant). Female part-full AI/AN adolescents were at greater risk of being victims of violence (5.0%) compared to their male counterparts (3.7%). In addition, part-full AI/AN family members (9.7%) and close friends (15.8%) were at greater risk of being victims of violence than non-AI/AN family members (6.6%) and close friends (10.1%). Further, part-full AI/AN females tended to self-report being victims of violence at a higher rate than AI/AN males for family members (females = 11.0%, males = 8.2%) and close friends (females = 20.1%, males = 10.8%).

And third, utilizing the same data as Hishinuma et al. (2005), Munnelly et al. (2018) compared part-full AI/AN adolescents to (1) part-full Native Hawaiians, (2) mixed AI/AN and Native Hawaiians, and (3) non-AI/AN/Native Hawaiians (i.e., Other ethnic group). Overall, this study found AI/AN adolescents, as compared to the other three ethnic groups, had relatively more non-traditional families with a smaller social network and may be more at risk for academic difficulties and health issues, with particular risk for mental health issues for those of mixed AI/AN-Native Hawaiian ancestry. In particular, mixed AI/AN-Native Hawaiians (1) worried more about their mental health in the past month (compared to AI/ANs and the Other ethnic group); (2) had more serious mental health problems in the past six months; and (3) had more recent counseling or any other mental health service. AI/ANs had a higher proportion who discussed problems with family members or friends relative to the other ethnic groups; however, AI/ANs also had a higher percent who self-reported that this did not help at all (as compared to Native Hawaiians and the Other ethnic group). Further, AI/ANs had a greater preference seeing a church minister or priest when experiencing mental health problems relative to the other three groups.

These three empirical efforts suggested that, while positive protective factors existed, AI/AN adolescents in Hawai‘i may have experienced substantially more negative major life events and self-report more traditional forms of mental health symptoms (e.g., symptoms of depression, anxiety, conduct, and substance use). However, to date, there has not been a study examining AI/AN adolescents in Hawai‘i and their major life events and mental health symptoms.

Purpose

The purpose of the present study is to examine the major life events and mental health symptoms among four mutually exclusive adolescent ethnic groups residing in Hawai‘i: (1) AI/ANs; (2) AI/AN-Hawaiians; (3) Native Hawaiians; and (4) Other (non-Indigenous). The two

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previous studies (i.e., Hishinuma et al., 2005; Munnelly et al., 2018) that used the same data set examined demographic, cultural, psycho-social, and violence victimization. In the present study, major life events are disaggregated based on stressors for the youth themselves, family members, and close friends. Demographic and social-support variables are used as co-variates to control for existing group differences. Based on Munnelly et al.'s (2018) prior finding of mixed AI/AN-Native Hawaiians having higher rates of self-reported mental health issues, we hypothesized that this same group would also have higher rates of self-reported negative life events and mental health symptoms as compared to the other three ethnic groups. Although the data are from the 1990s, these data are the only data set with such rich variables and this effort will further advance our understanding by clarifying the prevalence and risk-protective factors for AI/AN adolescents in Hawai'i.

METHODS

Sample Description

The data utilized for the present study were from Hishinuma et al. (2005) and Munnelly et al. (2018). These data were based on a five-year longitudinal cohort study conducted by the National Center on Indigenous Hawaiian Behavioral Health using the Hawaiian High Schools Health Survey (HHSHS; see Andrade et al., 2006). The HHSHS was based on the Sequoia High School Health Survey (Ackerson, Wiegman-Dick, Manson, & Baron, 1990). A total of 7,317 high school students (Grades 9-12) completed 12,284 surveys from the 1991-1992 to 1995-1996 school year across three Hawaiian Islands. For student participants who completed more than one questionnaire across the five-year period, the data from their first survey that they completed were utilized. Only 103 (1.4% of 7,317) did not complete the ethnicity question (see Measures section). Given the purpose of present study, data from these 103 students were not included in the analyses.

Table 1 presents the sample description (N = 7,214) with four mutually exclusive ethnic groups:

1) 287 of AI/AN ancestry (A; full or part, but no Native Hawaiian ancestry)
2) 614 of AI/AN and Native Hawaiian ancestries (AH; which could include other ancestries)
3) 4,219 of Native Hawaiian ancestry (H; full or part, but no AI/AN ancestry)
4) 2,094 of Other ancestry (O; with no AI/AN and/or Native Hawaiian ancestry), including Chinese American (0.9%), Japanese American (22.0%), European American (9.9%),

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Filipino American (16.3%), Portuguese (0.8%), Korean American (1.0%), Hispanic (0.4%), Samoan (1.3%), Tongan (0.3%), African American (0.2%), Puerto Rican (0.1%), or Mixed or other but no Native Hawaiian or AI/AN (46.6%)

Native Hawaiian adolescents were over-represented because the original purpose of the five-year study was to examine the mental health of Native Hawaiians. More females than males completed surveys, with this difference greater for AI/AN-Hawaiians as compared to Native Hawaiians and Others. There were more ninth graders primarily because we examined the first questionnaire completed for each student. The three indigenous groups had significantly more ninth graders than the Other group, and the Other group had significantly more eleventh graders than AI/AN-Hawaiians and Native Hawaiians. Despite these grade-level differences, there were no age differences (overall $p > .05$) among the four groups: AI/AN (m = 15.5, sd = 1.3, n = 287); AI/AN-Hawaiian (m = 15.4, sd = 1.2, n = 613); Native Hawaiian (m = 15.5, sd = 1.3, n = 4,216); and Other (m =15.5, sd = 1.2, n = 2,090).

Measures

Ethnicity Group. Ethnicity was based on two questions: (1) "What is your biological mother's ethnic background ('nationality' or race)?" and (2) "What is your biological father's ethnic background ('nationality' or race)?" The response choices were: "Hawaiian, Chinese, Japanese, Caucasian, Filipino, Portuguese, Korean, Hispanic, Samoan, Tongan, Black, American Indian/Alaska Native, Puerto Rican, Don't Know, and Other." The instructions indicated, "Check all that apply." The four ethnic groups were defined as follows: (1) AI/AN = mother and/or father with AI/AN ancestry, but neither parent with Native Hawaiian ancestry; (2) AI/AN-Hawaiian = mother and/or father with AI/AN ancestry, and at least one parent with Native Hawaiian ancestry; (3) Native Hawaiian = mother and/or father with Native Hawaiian ancestry, but neither parent with AI/AN ancestry; and (4) Other = no parent with AI/AN or Native Hawaiian ancestry.

Gender. Gender was based on, "What is your sex?" with 1 = male and 2 = female.

Grade Level. Grade level was based on, "What is your grade in school right now?" with 9, 10, 11, and 12 as response choices. Grade level was based on the first survey completed by each participant.

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Table 1
Sample Characteristics (*N* = 7,214)

		Total		One-Way χ^2	Full or Part AI/AN (A)		Part AI/AN & Native Hawaiian (AH)		Full or Part Native Hawaiian (H)		Not AI/AN or Native Hawaiian (O)		Two-Way χ^2		
		N	%[a]	Multiple Comparisons (Pairwise)[b]	*n*	%[a]	*n*	%[a]	*n*	%[a]	*n*	%[a]	*Overall* R^{2c}	Multiple Comparisons (2x4 Crosstabs) *P*[d]	Multiple Comparisons (2x2 Crosstabs)[e]
Ethnicity		7,214	100.0	H > O > AH > A	287	4.0	614	8.5	4,219	58.5	2,094	29.0			
Gender What is your sex?	Female	3,725	51.7	Females > Males	154	53.7	348	56.7	2,184	51.8	1,039	49.6	.001	*	AH > H & O
	Male	3,484	48.3		133	46.3	266	43.3	2,031	48.2	1,054	50.4			
Grade Level What is your grade in school right now?	9th	2,925	40.6	9th > 10th & 11th > 12th	125	43.9	282	46.0	1,780	42.3	738	35.3	.006	****	A, AH, & H > O
	10th	1,549	21.5		58	20.4	124	20.2	896	21.3	471	22.6			
	11th	1,445	20.1		57	20.0	106	17.3	787	18.7	495	23.7		****	O > AH & H
	12th	1,278	17.8		45	15.8	101	16.5	747	17.7	385	18.4			

Note: AI/AN = American Indian or Alaska Native
*p < .05, ****p < .0001
[a]Column percents
[b]One-way multiple comparisons were performed only if the overall one-way chi-square test was statistically significant; all overall one-way chi-square tests were statistically significant (p < .05)
[c]Square of the phi coefficient for interaction
[d]Two-way multiple comparisons (2x4) were performed only if the overall two-way chi-square test was statistically significant; all overall two-way chi-square tests were statistically significant (p < .05)
[e]Two-way multiple comparisons (2x2) were performed only if the two-way multiple comparisons (2x4) were statistically significant (p < .05)

Age. Age was based on, "How old are you now?" with 12, 13, 14, 15, 16, 17, 18, 19, and 20 as response choices.

Main Wage Earner's Education. "Main wage earner" was defined as the "breadwinner, who brings in the main money support into the family." Main wage earners' education was based on, "How much school did the main wage earner have?" with the following codes and response choices: (1) "8th grade or less"; (2) "some high school"; (3) "high school graduate or G.E.D." (general educational development); (4) "some college or community college"; (5) "college graduate"; (6) "master's degree"; and (7) "doctoral degree (Ph.D., medical, law)."

Main Wage Earner's Income Source. Main wage earners' income source was based on, "For the wage earner checked above, what is his/her source of income?" with the response choices: "employed part-time"; "employed full-time"; "unemployed; welfare"; "self-employed/own business or farm"; "retired"; and "disability." These seven choices were coded into four more homogenous

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categories: (1) unemployed, welfare, or disability; (2) retired or employed part-time; (3) self-employed/own business or farm; and (4) employed full-time.

Family Support and Friends' Support. Used as co-variates, family support and friends' support were based on six items each from the reliable and valid Perceived Social Support Scale (Procidano & Heller, 1983). One of the six items was reverse-scored resulting in higher mean scores reflected higher levels of social support. Both of these scales were found to be reliable and valid with the HHSHS sample (e.g., construct validity; positive association with grade-point average, negative correlation with suspensions and school infractions; Hishinuma et al., 2004).

Major Life Events Scale (MLES). The Major Life Events Scale (MLES) originated from Andrews, Lewinsohn, Hops, and Roberts (1993). The instructions were as follows: "Some events are listed on the left side of the chart below. We would like to know which of them has happened within the past 6 months and who it has happened to. If an event has happened, please put a check in the box under the person(s) it happened to." The students could check off boxes associated with "Family Member," "Close Friend," "Yourself," or "No One." There were 14 items: (1) "Died"; (2) "Had an illness or accident requiring hospitalization"; (3) "Was a victim of violence (was physically harmed by someone)"; (4) "Was arrested or got in serious trouble with the law"; (5) "Lost job or finances got worse"; (6) "Broke up with girl/boyfriend, got divorced, or separated"; (7) "Re-married or started living with someone"; (8) "Got pregnant (or got someone pregnant)"; (9) "Got in a lot of arguments or fights"; (10) "Had problems with drugs or alcohol"; (11) "Tried to commit suicide"; (12) "Left home or moved away"; (13) "Important possession stolen"; and (14) "Got in car or bike accident." The "Yourself" did not include, "Died" because the youth completing the survey could not have died. Items that were not checked off were scored 0, and items that were checked off were scored 1, with higher mean scores reflecting more major life events. Individual items (e.g., "was a victim of violence"; Hishinuma et al., 2005) and the whole scale have been shown to be reliable and valid (e.g., Makini et al., 2001; Miyamoto et al., 2001) for the HHSHS sample.

Depressive Symptoms. Depressive symptoms were measured using the reliable and valid Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The 20 items were rated on a 0–3 scale: 0 = "rarely or none of the time (0–1 day)"; 1 = "some or little of the time (1–2 days)"; 2 = "a moderate amount of time (3–4 days)"; and 3 = "most or all of the time (5–7 days)." Four composite mean scores were derived based on prior research, including on the HHSHS sample (e.g., Hishinuma et al., 2012): (1) Negative Affect Factor, 13 items; (2) Positive Affect Factor, 5 reverse-scored items; (3) Social Factor, 2 items; and (4) Overall = mean of 3 factors. Higher scores

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indicated higher levels of depressive symptoms. The CES-D was found to be valid with the HHSHS sample (e.g., criterion validity, CES-D predicted Diagnostic Interview Scale for Children major depressive disorder; Prescott et al., 1998).

Anxiety Symptoms. Anxiety symptoms were represented by the reliable and valid State-Trait Anxiety Inventory (STAI, Form X; Spielberger, Gorsuch, & Lushene, 1970). The STAI State subscale consisted of 20 items rated on "how you feel now" with 0 = "not at all," 1 = "somewhat," 2 = "moderately so," and 3 = "very much so." Available for only one of the school years, the STAI Trait subscale consisted of 20 items rated on "how you generally feel" with 0 = "almost never," 1 = "sometimes," 2 = "often," and 3 = "almost always." Based on prior research using the HHSHS sample (e.g., Hishinuma et al., 2000), both the State and Trait subscales factored into positively worded (anxiety absent) and negatively worded (anxiety present) items: State Anxiety Absent = 10 items reverse-scored; State Anxiety Present = 10 items; Trait Anxiety Absent = 7 items reverse-scored; and Trait Anxiety Present = 12 items. One Trait Anxiety Present item (i.e., "I try to avoid facing a crisis or difficulty") was omitted because of the poor psychometric properties. Three composite scores were also computed: (1) State-Anxiety Overall (mean of the 2 State subscales); (2) Trait-Anxiety Overall (mean of the 2 Trait subscales); and (3) Overall (mean of the State-Anxiety Overall and Trait-Anxiety Overall composites). Higher mean scores indicated higher levels of anxiety symptoms. Cronbach alphas ranged from .83 to .93 and the inter-factor correlations were supportive of the STAI's validity for the HHSHS sample. The STAI's construct validity was supported with the HHSHS sample (e.g., STAI predicted Diagnostic Interview Scale for Children anxiety disorders; Hishinuma, Miyamoto et al., 2001).

Conduct Symptoms. Conduct symptoms were measured using the reliable and valid Braver Aggressiveness Dimension Scale (BADS; Braver, Fogas, Sandler, & Wolchik, 1986). The BADS consisted of 14 items rated on a 0–2 scale: 0 = "not true," 1 = "somewhat true," and 2 = "very or often true." Four composite mean scores were derived based on prior research using the HHSHS sample: (1) Negative Mood Factor, 7 items; (2) Intimidation Factor, 5 items; (3) Vocal Factor, 2 items; and (4) Overall = mean of 3 factors (e.g., Chang, 2007). Higher scores indicated higher levels of aggression/conduct symptoms. Cronbach alpha was .85 for the HHSHS sample (Chang, 2007). The BADS was found to be valid with the HHSHS sample (e.g., construct validity, negatively correlated with measures of academic achievement; Hishinuma, Foster et al., 2001).

Substance Use Symptoms. Substance use was measured using an abbreviated version of the Substance Abuse Subtle Screening Inventory for Adolescents (SASSI-A; Miller, 1990). This

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abbreviated version consisted of six items with 0 = "no" and 1 = "yes." Three composite mean scores were derived based on prior research using the HHSHS sample (Nishimura et al., 2001): (1) Substance Use (subscale), 3 items; (2) Negative Impact, 3 items; and (3) Overall = mean of 2 factors. Higher scores indicated higher levels of substance use. Cronbach alpha was .66 for the 6 items (Nishimura et al., 2001). The SASSI-A was found to be valid with the HHSHS sample (e.g., criterion validity, SASSI-A predicted Diagnostic Interview Scale for Children substance abuse and dependency; Nishimura et al., 2001).

Procedure

Parents and students were provided written materials describing the nature and purpose of the HHSHS questionnaire. Parents were asked to return a postcard if they did not want their child to participate. Students who had their parents' permission to participate had the option of providing their formal agreement or not on the day of the HHSHS administration. Students who provided their written agreement completed the survey in their homerooms with supervision by their teachers. At the time that this study was conducted in 1992, this type of "passive consent" was considered appropriate and was approved by the University of Hawai'i at Mānoa's Committee on Human Studies (i.e., Institutional Review Board). The survey generally took 30 to 45 minutes for the students to complete. Approximately 60% of the student body was surveyed. A previous analysis showed that there was a higher proportion of females who were surveyed, and individuals who were surveyed were more likely to have fewer absences, suspensions, and conduct infractions, and higher grade-point averages (Andrade et al., 2006).

Data Analysis

The analyses were conducted using SAS 9.4. One-way and two-way chi square tests were utilized to determine whether there were frequency and proportional differences based on ethnicity, gender, ethnicity-by-gender, grade level, and ethnicity-by-grade level.

Means, standard deviations, and sample sizes were computed for each of the dependent measures (i.e., major life events and symptoms of depression, anxiety, conduct, and substance use) for each of the four groups. Analysis of variance (ANOVA) and Student-Neuman-Keuls pairwise comparisons were employed to determine whether there were group differences for each of the dependent variables. The overall variance accounted for was also computed as a measure of effect

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size. In addition, for the four sets of mental health symptoms, multiple regression was utilized with the following covariates as part of the model of independent variables: gender, grade level, main wage earner's education, main wage earner's income source, family support, friends' support, and the three major life events (i.e., self, family member, close friend). For all tests, we set alpha = .05 because we employed Student-Neuman-Keuls, which takes into account the number of pairwise comparisons.

RESULTS

Table 2 (see Appendix) presents the results of the four ethnic-group differences based on the dependent measures of major life events and mental health symptoms. When no covariates were utilized, ethnic group was statistically significant for 18 of the 21 dependent measures. The most consistent pattern was that the AI/AN-Hawaiian group scored higher and the Other ethnic group scored lower on the outcome measures. The AI/AN group also scored on the higher side, but typically alongside the AI/AN-Hawaiian group for five of the dependent measures (i.e., self and close friend major life events, conduct overall, substance use Factor 1, and overall substance use). Specific to major life events, AI/ANs and AI/AN-Hawaiians had higher self and close friend major life events than the Native Hawaiian and Other ethnic group, and AI/AN-Hawaiians had higher family member major life events than the other three ethnic groups. However, the variances accounted for by the group differences were relatively small, ranging from only .001 to .022.

When controlling for the nine covariates (i.e., gender, grade level, main wage earner's education, main wage earner's income source, family support, friends' support, and three major life events), the overall pattern changed with the Native Hawaiian group scoring generally higher on 11 of the 13 dependent measures that had statistically significant group differences, with the exception being for substance use symptoms. The AI/AN-Hawaiian group remained high as well on 8 of the 13 dependent measures, including for substance use symptoms. The overall model with 10 independent variables (i.e., 9 covariates and ethnic group) resulted in substantially higher variances accounted for ranging from .063 to .335.

DISCUSSION

The purpose of the present study was to examine the major life events and mental health symptoms among four mutually exclusive adolescent ethnic groups residing in Hawai'i: (1)

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AI/ANs; (2) AI/AN-Hawaiians; (3) Native Hawaiians; and (4) Other (non-Indigenous).

The overall results were consistent with our hypothesis indicating generally higher self-reported rates of predominantly negative major life events and mental health symptoms for AI/AN-Hawaiian youth. However, when taking into account the differential impact of the nine covariates (including major life events), the overall pattern was that the Native Hawaiian adolescent group self-reported higher symptoms, followed by AI/AN-Hawaiians.

Limitations

As indicated in Munnelly et al. (2018), there were several limitations to the use of this data set. First, the data were from the early to mid-1990s. However, the data set was used because it was the only large existing database that included an adequate number of AI/ANs with raw data at the individual level. The relevant question is, "Has there been any major event or trend since the 1990s that would make the results different if the same study was conducted at present?" One substantial movement that started in the 1960s and 1970s was the Native Hawaiian Renaissance (e.g., Tsai, 2009). This movement increased awareness of past injustices (e.g., overthrow of the Native Hawaiian monarchy), fostered pride in Native Hawaiian culture, and resulted in concrete advances for Native Hawaiians (e.g., immersion charter schools). In addition, there has been a general increase in minority and indigenous perspectives and rights nationally and globally (e.g., United Nations, 2007). Particular to Native Hawaiians and AI/ANs, Native Hawaiians supported the protests of building the Dakota Access Pipeline on the Standing Rock Indian Reservation in North Dakota in 2016, and likewise, AI/ANs supported the protests of building the Thirty Meter Telescope on Mauna Kea on Hawai‘i Island in 2019 (Gomes, 2019; Ladao & Nakaso, 2019). Therefore, it is important to conduct studies that will attempt to either replicate these findings or refute them based on contemporary research.

Second, there was variability in the sample sizes for the four ethnic groups (i.e., 287 AI/ANs, 614 mixed AI/AN-Native Hawaiians, 4,219 Native Hawaiians, 2,094 in the Other ethnic group). Therefore, there was more statistical power for pairwise comparisons that involved the Native Hawaiians and Other ethnic group.

And third, we did not analyze group differences among each of the 14 major life events given the relatively low prevalences for some of the items (e.g., suicide attempt) and the scope of this study.

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Implications

Despite these limitations, this study provided several implications. AI/AN-Hawaiians and AI/ANs self-reported more negative major life events, and AI/AN-Hawaiians had generally higher mental health symptoms. The latter finding is consistent with additive risk for youth who are indigenous to more than one culture, especially when the indigenous cultures have been colonized and marginalized. Thus, the additive risk calls for commensurate supports and resources that are responsive to the unique combination of Native Hawaiian and AI/AN cultures.

To complicate matters, however, when the covariates, including major life events, were controlled for, there was increased mental health symptom risk for Native Hawaiians and the total variance accounted for increased from a high of .022 to a high of .335. This set of findings suggests the need for prevention and treatment efforts for all ethnic groups that decrease stressful life events, including injury and mortality, suicidality, victimization, crime, substance use, drastic vocational and financial challenges, and major negative disruptions to social networks. In addition, however, the overall finding of Native Hawaiian youth being at greater risk based on both this study and the previous literature (e.g., Andrade et al., 2006) reinforces the unfortunate status of Native Hawaiian youth in their own homeland and the social determinants of health and mental health (Kaholokula, 2017; Papa Ola Lōkahi, 2020). This set of circumstances calls for a strategic indigenous, strength- and place-based approach that affords the necessary resources to improve the mental health of Native Hawaiians.

The effect sizes of the present study, even at the high of .335, suggest that much more needs to be considered to improve the mental health of AI/ANs. For example, as indicated by the American Psychiatric Association (2017), key barriers to accessing AI/AN mental health services include: economic obstacles (cost, lack of insurance); lack of awareness about mental health and available services; stigma associated with mental illness; lack of culturally sensitive mental health services; mistrust of health care providers; and lack of appropriate intervention strategies (including integration of mental health and primary health care services). An added barrier for AI/AN youth in Hawai'i is that they are difficult to identify because they are not in any particular geographic location. Therefore, strategic outreach efforts are needed, including AI/AN and Native Hawaiian leaders engaging their communities to help identify and screen AI/AN youth with the goal of providing individualized services that minimize risk factors and enhance protective factors, and to ideally create a platform for AI/ANs for promoting better and more effective youth and family-based healing strategies.

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Such efforts must also consider the unique role of indigenous culture for AI/ANs and Native Hawaiians in Hawai‘i, including the complexity of mixed ancestry and identity, given that the large majority of AI/ANs and Native Hawaiians in Hawai‘i are of mixed heritage. Recent events that have gained national attention have also demonstrated a common kindred spirit between AI/ANs and Native Hawaiians. As indicated above, Native Hawaiians supported the protests of building the Dakota Access Pipeline on the Standing Rock Indian Reservation in North Dakota in 2016, and AI/ANs supported the protests of building the Thirty Meter Telescope on Mauna Kea on Hawai‘i Island in 2019 (Gomes, 2019; Ladao & Nakaso, 2019). As indicated by Munnelly et al. (2018), a youth AI/AN cultural identification scale has yet to be developed that is tailored to AI/AN youth in Hawai‘i who are more likely to be of mixed ancestry. Research on such an instrument should provide greater insight into the role of culture for AI/AN youth in Hawai‘i.

In particular reference to the present study, future research should examine whether there are patterned associations between individual stressful life events and specific mental health symptoms to better target prevention and intervention efforts. When such associations are identified and involve, for example, such negative life events as being a victim or perpetrator of crime, consideration should be given to more culturally appropriate interventions, such as restorative justice (Martin, 2014). In addition to this, however, it is important to also determine the association between protective factors, such as resilience and mental health well-being, and to incorporate nurturing these protective factors in interventions. Given the smaller family size of AI/ANs in Hawai‘i, greater supports may be needed both for and surrounding the family.

These implications and future research derived from the present study complement well the previous ramifications explicated by Munnelly et al.’s (2018) discussion points as follows: First, AI/AN youth appear to be open to different avenues of protective factors, including social supports and alternative-complementary interventions. Second, creative and/or targeted assistance are needed, including culturally appropriate and “bottom-up” community-based approaches (Allen et al., 2011; Gone & Trimble, 2012; Goodkind et al., 2010; Markstrom, Whitesell, & Galliher, 2011; Novins & Bess, 2011; Snipp & Saraff, 2011). Third, positive, strength-based youth developmental approaches should be considered (Allen et al., 2011; Antonio & Chung-Do, 2015) in more traditional environments (e.g., one-on-one therapy), but also in non-traditional venues (e.g., in schools, at churches, in the community; Castagno & Brayboy, 2008; using technology, such as telepsychiatry for rural and neighbor islands). And fourth, we should address more macro historical, political, and sociological issues that may more likely impact all indigenous youth (e.g.,

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Campbell & Evans-Campbell, 2011; Center for Native American Youth, 2016; Gone & Trimble, 2012; Goodkind et al., 2010; Sequist, 2017).

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APPENDIX

Table 2
Ethnic Group Differences in Major Life Events and Mental Health Symptoms

		Total			Full of Part AI/AN (A)			Part AI/AN & Native Hawaiian (AH)			Full of Part Native Hawaiian (H)			Not AI/AN or Native Hawaiian (O)			Analysis of Variance					Multiple Regression		
Category	**Variable**	***M***	***SD***	***N***	***m***	***sd***	***n***	***m***	***sd***	***n***	***m***	***sd***	***n***	***m***	***sd***	***n***	***F***	***df***	R^{2a}	n^a	**Pairwise Multiple Comparisons[b]**	R^{2c}	p^c	**Pairwise Multiple Comparisons[d]**
Major Life Events	Youth (Self)	0.07	0.11	6,919	0.09	0.12	278	0.09	0.13	590	0.07	0.10	4,013	0.07	0.10	2,038	11.3	3, 6915	.005	****	A, AH > H, O	n.a.	n.a.	n.a.
	Family Member	0.16	0.16	6,919	0.17	0.17	278	0.20	0.18	590	0.17	0.16	4,013	0.13	0.14	2,038	51.9	3, 6915	.022	****	AH > H, A > O	n.a.	n.a.	n.a.
	Close Friend	0.13	0.17	6,919	0.17	0.21	278	0.16	0.19	590	0.14	0.16	4,013	0.12	0.16	2,038	16.0	3, 6915	.007	****	A, AH > H, O	n.a.	n.a.	n.a.
Depressive Symptoms	Negative Affect (Factor 1)	0.67	0.59	6,750	0.68	0.61	267	0.75	0.63	576	0.68	0.59	3,904	0.63	0.59	2,003	6.9	3, 6746	.003	****	AH > O	.294	*	H > O
	Positive Affect (Factor 2)	1.19	0.59	6,718	1.16	0.64	268	1.23	0.62	575	1.19	0.57	3,881	1.17	0.60	1,994	1.7	3, 6714	.001		none	.170	*	H, AH > A
	Social (Factor 3)	0.47	0.69	6,671	0.49	0.73	266	0.57	0.76	572	0.47	0.69	3,843	0.44	0.67	1,990	5.5	3, 6667	.002	***	AH > A, H, O	.133		AH > A, O
	Overall	0.78	0.49	6,751	0.78	0.52	268	0.85	0.54	576	0.78	0.49	3,904	0.75	0.49	2,003	6.6	3, 6747	.003	***	AH > H, A, O	.275	**	AH, H > A; H > O
Anxiety Symptoms	State-Anxiety Absent	1.28	0.74	6,741	1.34	0.78	272	1.36	0.78	572	1.27	0.74	3,892	1.28	0.73	2,005	3.1	3, 6737	.001	*	none	.231		none
	State-Anxiety Present	0.67	0.57	6,737	0.62	0.57	271	0.72	0.59	572	0.70	0.57	3,891	0.61	0.54	2,003	12.6	3, 6733	.006	****	AH, H > A, O	.147	****	AH, H > A; H > O
	Trait-Anxiety Absent	1.29	0.66	2,947	1.31	0.67	144	1.35	0.67	205	1.28	0.67	1,390	1.28	0.66	1,208	0.9	3, 2943	.001		none	.272		none
	Trait-Anxiety Present	0.99	0.59	2,950	0.95	0.59	144	0.96	0.56	205	1.03	0.60	1,391	0.96	0.57	1,210	4.2	3, 2946	.004	**	none	.231	**	H, O > A; H > AH
	State-Anxiety Overall	0.98	0.53	6,744	0.98	0.56	272	1.04	0.56	573	0.99	0.54	3,893	0.94	0.51	2,006	5.6	3, 6740	.002	***	AH > O	.256	**	AH, H > A; H > O
	Trait-Anxiety Overall	1.14	0.52	2,950	1.13	0.54	144	1.16	0.52	205	1.16	0.52	1,391	1.12	0.52	1,210	1.3	3, 2946	.001		none	.335		H > A
	Overall	1.01	0.52	6,795	1.01	0.53	275	1.07	0.54	578	1.01	0.52	3,917	1.00	0.50	2,025	2.7	3, 6791	.001	*	none	.277	*	H, AH, O > A
Conduct Symptoms	Negative Mood (Factor 1)	0.56	0.46	6,988	0.57	0.50	274	0.62	0.48	598	0.57	0.46	4,064	0.53	0.45	2,052	7.5	3, 6984	.003	****	AH > O	.234		none
	Intimidation (Factor 2)	0.19	0.31	6,983	0.18	0.30	274	0.22	0.34	597	0.20	0.32	4,063	0.15	0.29	2,049	12.5	3, 6979	.005	****	AH > A, O; H > O	.159	***	H, AH > A, O
	Vocal (Factor 3)	0.44	0.60	6,964	0.45	0.60	274	0.48	0.62	594	0.46	0.61	4,049	0.40	0.57	2,047	5.9	3, 6960	.003	***	AH > O	.063		H > O
	Overall	0.40	0.36	6,988	0.40	0.37	274	0.44	0.39	598	0.41	0.37	4,064	0.36	0.35	2,052	11.7	3, 6984	.005	****	AH, H, A > O	.184	**	H > A, O
Substance Use Symptoms	Substance Use (Factor 1)	0.19	0.30	6,671	0.23	0.32	268	0.21	0.32	571	0.19	0.30	3,823	0.17	0.29	2,009	5.4	3, 6667	.002	**	A > H, O; AH > O	.207		none
	Negative Impact (Factor 2)	0.05	0.16	6,662	0.05	0.17	267	0.07	0.20	571	0.05	0.16	3,815	0.04	0.16	2,009	4.2	3, 6658	.002	**	AH > A, H, O	.140		AH > A, H
	Overall	0.12	0.20	6,671	0.14	0.22	268	0.14	0.23	571	0.12	0.20	3,823	0.11	0.20	2,009	6.0	3, 6667	.003	***	A, AH > O	.230		none

Note: AI/AN = American Indian or Alaska Native; n.a. = not applicable (because major life events were employed as covariates)
*p < .05, **p < .01, ***p < .001, ****p < .0001
[a]Without covariates
[b]t -test pairwise multiple comparisons without covariates adjusting the means
[c]With covariates of sex, grade level, main wage earner's education level, main wage earner's income, family support, friends support, and major life events for youth, family member, and close friend; p value of ethnic group main effect
[d]t -test pairwise multiple comparisons with covariates adjusting the means

EXAMINING CULTURAL IDENTIFICATION AND ALCOHOL USE AMONG AMERICAN INDIAN AND CAUCASIAN COLLEGE STUDENTS

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Abstract: Previous research consistently concludes American Indians (AI) demonstrate higher levels of alcohol use than Caucasians (CA); however, recent research suggests AIs may be drinking at similar or lower rates than CAs. Little research has examined cultural identification as a contributing factor to alcohol use. This study sought to examine cultural identification and its relationship to alcohol use between AI and CA college students. Participants consisted of 56 AI and 87 CA college students who self-reported on past 6-month alcohol consumption and how they culturally identified per the Orthogonal Theory of Biculturalism. CAs reported a significantly higher average daily alcohol consumption than AIs who identified as Marginal, Traditional, and Assimilated. This research represents a compelling anecdotal and empirical socio-cultural paradigm shift from the "AIs drink more" mindset among college students. Further, understanding the relationship between cultural identification and alcohol use enhances assessment, diagnostic, and intervention efforts for both AIs and CAs.

INTRODUCTION

Previous research (Skewes & Blume, 2014; Johnston, O' Malley, & Bachman, 2000; Presley, Meilman, & Leichliter, 2002; Turrisi, Mallett, & Mastroleo, 2006) demonstrated college students experience higher levels of alcohol consumption and alcohol-related consequences; however, most of these findings have been restricted to predominantly Caucasian (CA) college student samples. Thus, there is insufficient research dedicated to American Indian (AI) college student alcohol consumption and alcohol related consequences (Hagler, Pearson, Venner, & Greenfield, 2017). Previous findings on alcohol use among CA college students cannot be generalized to the AI college students due to cultural variation (McDonald & Chaney, 2003). It is possible cultural identification among AIs may contribute to the level of alcohol use or may serve

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as a protective factor. This study was a preliminary exploration of the differences between alcohol use and cultural identity among AI and CA college students.

Alcohol Use among College Students

The consumption of alcohol among college students continues to be a significant problem, and the prevalence rate has been stable over the past twenty years (Substance Abuse and Mental Health Services Administration, 2013; Johnston et al.,2000). Problematic alcohol use for college students is often used as a maladaptive coping response to external stressors such as academic responsibilities or time management (Metzger et al., 2016). Past research suggests approximately 58% of full-time college students drink alcohol, 40% of college students engaged in binge drinking, and alcohol use is higher among college students than non-attending peers (NIAAA, 2019; Johnston et al., 2000; Presley et al., 2000). In addition, peer alcohol consumption tends to be the most robust predictor of alcohol misuse among college students (Perkins, 2002). Specifically, studies have found peer alcohol consumption to be associated with higher levels of one's own use and individuals tend to overestimate the extent to which their peers consume alcohol (Borsari & Carey, 2001; Perkins, 2002). Furthermore, past studies have indicated higher parental income among CAs to be associated with increased rates of alcohol consumption, whereas lower parental income has been associated with lower levels of alcohol use (Humensky, 2010; Martin et al., 2009).

Alcohol consumption among college students has been associated with problems such as the following: involvement with police, property damage, physical injuries, date rape, fatal car accidents, and engaging in unprotected sex (Metzger et al., 2016; Kuo, Wechsler, Greenberg, & Lee, 2003; Carmack & Lewis, 2016). Research suggests that about 1 in 4 college students report academic consequences from drinking such as missing class, doing poorly on exams, and receiving lower grades. These academic consequences are five times more likely to occur for college students that binge drink (NIAAA, 2019). However, protective factors (i.e., variables that protect against the occurrence of an undesirable outcome and enables occurrence of a positive outcome) may help to buffer against alcohol consumption rates and alcohol-related problems, specifically among AI college students (Henson, Sabo, Trujillo, & Teufel-Shone, 2017).

Cultural Identification among American Indians

Cultural identification may be a protective factor through personal/social strength, positive personal adjustment, and well-being (Oetting & Beauvais, 1990, McDonald & Gonzalez, 2006;

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McDonald & Chaney, 2003; McDonald, Morton, & Stewart, 1992). Cultural identification or orientation is defined as the degree to which an individual associates with and represents themselves as a member of a specific cultural group (Oetting & Beauvais, 1990). In addition, cultural identification is influenced by an individual's interactions within the environment and individual experiences.

Colonization of AI populations has influenced cultural changes and disruption within AI culture (Pichette, Garrett, Kosciulek, & Rosenthal, 1999). Specifically, research has found the following to have lasting intergenerational and psychological effects on AI populations: forced removal from tribal lands, placement of AI children in boarding schools, broken treaties, pandemics, and genocidal policies (Brave Heart, 1998; Brown, Dickerson, & Amico, 2016; Duran & Duran, 1995; Evans-Campbell, 2008; McDonald & Chaney, 2003). Daily reminders of historical trauma (i.e., emotional and psychological wounding over generations emanating from group experience) among AIs include loss of traditional beliefs and practices, lack of cultural awareness, loss of language, and loss of family systems (Brave Heart, 2003; Evans-Campbell, 2008). Historical trauma may have resulted in alienation among AIs from their usual forms of coping and is associated with PTSD symptoms, anxiety, depression, cultural identity issues, and substance use (Ehlers, Gizer, Gilder, Ellingson, & Yehuda, 2013; Oetting & Beauvais, 1990; Whitbeck, Adams, Hoyt, & Chen, 2004).

Cultural Identification and Alcohol Use among American Indians

The research on cultural identification and alcohol use are inconsistent. While some studies suggest higher AI traditional identification to be related to lower likelihood of problematic alcohol consumption and higher likelihood of alcohol cessation (Herman-Stahl, Spencer, & Duncan, 2003; May, 1982), other research has not supported these results (Bates, Beauvais, & Trimble, 1997). Furthermore, studies have found higher levels of alcohol use among individuals who closely identify with non-AI values; whereas, individuals who identify equally with both AI and non-AI values had the lowest rates of alcohol use (May, 1982). In contrast, research suggests bicultural individuals that live on the reservation are more likely to exhibit high alcohol consumption due to increased stressors (Herman-Stahl et al., 2003). However, higher identification with AI culture was found to relate to decreased substance use through increased family communication and parental monitoring, resulting in prevention of alcohol use (Urbaeva, Booth, & Wei, 2017). Furthermore, Matamonasa-Bennett (2017) found on the Great Lake reservation that reconnecting

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with traditional AI cultural values influenced abstinence and sobriety. AIs who engage in culture events or traditional practices (e.g. powwows, beading, prayer/sage ceremonies) experience health enhancing effects, which decrease alcohol use (Brown et al., 2016).

Despite the inconclusiveness within the research, intervention programs tend to rely on the assumption that higher traditional identification will protect against higher alcohol rates and negative consequences (McDonald & Gonzalez, 2006; McDonald & Chaney, 2003; McDonald et al., 1992; Oetting & Beauvais, 1990; Timble, 2007). The theoretical model used to explain the relationship between cultural identification and alcohol use focuses on acculturation stress, whereby the process of behavioral and psychological change as a result of adapting from a minority culture to dominant culture is assumed to be extremely hard, which prompts alcohol consumption or other negative coping mechanisms (Beauvais, 1992; Clark 2006). Overall, the existing research done on cultural identification and alcohol use among AIs is lacking, and there is a need for further research in this area to clarify the relationship.

Therefore, the current study examined the relationship between alcohol use and cultural identity among AI and CA college students. It was hypothesized that AI college students who identify as traditional AI would have lower levels of alcohol use, and those who identify as assimilated or marginal would have higher levels of alcohol use. In addition, those who identify as bicultural would have lower levels of alcohol use. It was hypothesized that CA college students would have higher alcohol levels compared to AIs.

METHODS

Participants

Participants were college students enrolled at a Midwestern university. Inclusion criteria consisted of participants who identified their primary ethnicity as either AI or CA, were at least 18 years of age, enrolled in college, and who had consumed alcohol in the past 6 months. Students choosing to participate in research were recruited by means of a research participation sign-up board that lists ongoing research. Participants were compensated either with course credit/extra credit or a nominal monetary incentive. Initially, 148 college students chose to participate, but a subset of initial respondents (n = 5) did not meet criteria and reduced the final sample to N = 143. Fifty-six AI students and 87 CA students participated in this study. Slightly over half of the sample was female (56.1%) and a dichotomous variable was constructed for ages 18-25 or age 26 and

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above. Participants were freshman (27.27%), sophomores (21.68%), juniors (11.19%), seniors (18.88%), and graduate students (20.98%).

Measures

Demographics

Participants provided data on their age, gender, education, and the race with which they primarily identified.

Alcohol Use

Alcohol consumption among participants was measured via the Daily Drinking Questionnaire (DDQ), which assessed quantity and frequency of alcohol consumption over the prior 6 months (Collins, Parks, & Marlatt, 1985). Participants were asked to recall the past 6 months and indicate, for each day of the week, how many standard drinks they consumed in their typical week. The typical number of drinks per week was divided to obtain an average number of drinks per day. Prior research supports the validity and one-week test-retest reliability (r = 0.93) of the DDQ and alcohol use (Miller et al., 1998).

Cultural Identification

The Northern Plains Biculturalism Inventory (NPBI) assesses cultural competence along two distinct cultural dimensions; however, a disadvantage of the NPBI is the lack of standardized standard error, means, and standard deviations, which inhibits the ability to make comparisons of findings across multiple studies (Allen & French, 1994; McDonald et al., 1998). The American Indian Biculturalism Inventory-Northern Plains Version (AIBI-NP) was developed based on the NPBI, but was derived to have a more psychometrically sound scoring procedure, which increases the utility of the inventory (McDonald, 1998), and, thus, was chosen for use in this study.

Participants completed the AIBI-NP questionnaire, a 26-item self-report measure assessing cultural orientation on four levels: traditional, assimilated, bicultural, and marginalized. Participants endorsed the extent to which they agreed or disagreed on a 4-point Likert scale (ranging from 1 = No comfort to 4 = Complete comfort). The AIBI-NP has two subscales: American Indian cultural identification (AICI) and European American cultural identification (EACI). Sample American Indian cultural identification items are, “How strongly do you identify with American Indian culture”

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and "How comfortable are you in encouraging your (or related) children to learn and practice American Indian ways?" Sample European American cultural identification items are, "How often do you attend White celebrations (i.e. White ethnic festivals, parades, etc.)" and "In general, how much do you believe 'Success' best means when an individual wins or achieves something?"

Individuals who identify as "traditional" have a high level of AICI and low level of EACI. Those who identify as "assimilated" have a low level of AICI and high level of EACI. "Bicultural" individuals have a high level of both AICI and EACI. "Marginalized" individuals have a low level of both AICI and EACI. Prior research supports convergent validity with the NPBI ($p > .05$) along with internal consistency ($r = .89$) for AIBI-NP subscales, and alternate-forms reliability with the NPBI ($p < .01$; McDonald et al., 2015).

Procedure

All study materials and procedures were approved by the university Institutional Review Board. Before survey administration, participants were informed that their participation was voluntary and that they could discontinue taking the survey at any time or could leave any item blank that they did not want to answer. All surveys were conducted anonymously and were completed online using Qualtrics software.

Data Analysis

The SPSS statistical analytical software program was utilized for the data analysis. A one-way analyses of variance (ANOVA) was conducted assessing the four categories of the AIBI-NP (i.e., traditional, marginal, assimilated, and bicultural) as independent variables and alcohol use as the dependent variable. In addition, an ANOVA was conducted to determine if there was a relationship between alcohol use and age group. For the variables indicating significance, a follow-up Tukey post-hoc test was conducted.

RESULTS

An ANOVA was computed for alcohol use with the standardized alcoholic drinks per day as the dependent variable and cultural identification group as the independent variable. Results indicated significant differences in daily alcohol consumption between groups $F(4, 127) = 6.86$, $p < .05$ (see Table 1). Post hoc analyses using Tukey indicated CA participants ($n = 80$) had a

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significantly higher average daily alcohol consumption (*M* = 1.26, *SD* = 1.14) than those who identified as marginal (*n* = 25, *M* = 0.49, *SD* = 0.49), traditional (*n* = 13, *M* = 0.37, *SD* = 0.41), and assimilated (*n* = 11, *M* = 0.27, *SD* = 0.29). An analysis of covariance using gender and age as covariates revealed the same pattern of significant results. It is important to note the bicultural group has the lowest rate of alcohol use but due to its very low number (*n* = 3), valid comparisons with CAs were not possible.

Table 1
ANOVA Comparisons of Alcohol Consumption* by Cultural Identification

Group	*n*	Mean	*SD*	Post Hoc
Marginal (1)	25	0.491	0.495	5>1
Bicultural (2)	3	0.191	0.329	
Traditional (3)	13	0.374	0.414	5>3
Assimilated (4)	11	0.272	0.295	5>4
Caucasian (5)	80	1.269	1.148	5>1,3,4

Note. The numbers in parentheses in group names refer to the numbers used in illustrating statistically significant differences at $p < .05$ in post hoc.
*Alcohol Consumption = average amount of standard drinks consumed daily.

A series of 2 (age group) X 2 (ethnicity) analyses of variance (ANOVA) were computed on the DDQ, using the standardized alcoholic drinks per day as the dependent variable and age group and ethnicity as the independent variable (see Table 2). Results showed a significant main effect of age group in daily alcohol consumption $F(1, 132) = 8.85$, $p < .05$, with 18- to 25-year-olds having a higher daily average alcohol consumption (*M* = 1.39, *SD* = 1.15) than 26-year-olds and older (*M* = 0.46, *SD* = 0.59). Results indicated a significant main effect of ethnicity in daily alcohol consumption ($F_{(1, 132)} = 7.95$, $p < .05$); CAs having a higher average daily alcohol consumption than those who identified as AI.

Table 2
Means and Standard Deviations for Alcohol Use as a Function of Age Group and Ethnicity

Age Groups	*n*	Mean	*SD*
American Indians			
18-25	35	0.49	0.48
26+	19	0.27	0.32
Caucasians			
18-25	71	1.39	1.15
26+	11	0.46	0.59

Note. Alcohol use = average amount of standard drinks consumed daily. Age was coded as "18-25 = 1, 26+ = 2"

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An ANOVA was computed on the parent's total estimated household income as the dependent variable and cultural identification group as the independent variable. Results indicated a significant difference in parent's total estimated household income $F(4,134)=6.08$, $p < .05$ between cultural identification groups (see Table 3). Those who identified as marginal reported significantly lower parental total estimated household income (M = 2.52, SD = 1.08) than those who identified as CA (M = 3.46, SD = 0.76).

Table 3
ANOVA Comparisons of Parent's Total Estimated Household Income by Cultural Identification

Group	*n*	Mean	*SD*	Post Hoc
Marginal (1)	27	2.52	1.08	5>1
Bicultural (2)	3	3.33	1.15	
Traditional (3)	13	3.08	0.95	
Assimilated (4)	11	3.27	0.90	
Caucasian (5)	85	3.46	0.76	5>1

Note. The numbers in parentheses in group names refer to the numbers used in illustrating statistically significant differences in post hoc.

DISCUSSION

The current study revealed significant differences in alcohol use between CA and AI college students. Early research suggests AIs had higher alcohol consumption rates and frequency of use compared to other ethnicities (Beauvais, 1998). However, this study is consistent with other recent literature suggesting AIs have similar or lower alcohol use rates than CAs (Cunningham, Solomon, & Muramoto, 2015, Looby, Luger, & Guartos, 2017; Sargent, 2017). Instead, the current study suggests AIs may be experiencing alcohol use differently depending on how they culturally identify. The current study's findings demonstrated CA college students having a higher average daily alcohol consumption than AIs who identified as marginal, traditional, or assimilated. Little research has examined alcohol use and cultural identification among AI college students. Overall, these findings are consistent with previous research that show CA college students report higher alcohol consumption (Looby et al., 2017; Sargent, 2017).

Demographic differences were observed. For example, AIs who identified as marginal reported significantly lower total parental estimated household income than those who identified as CA. This may have resulted in CAs having higher average daily alcohol consumption due to having more disposable income to buy alcohol with than AIs who identified as marginal. Previous research suggested AIs who worked full-time and were married had higher rates of alcohol

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consumption and binge drinking due to increased disposable income (Greene, Eitle, & Eitle, 2014). Thus, an increase in disposable income for AIs who identify as marginal may influence their average alcohol consumption per day.

Limitations

Multiple study limitations are acknowledged. Students who did not drink in the past 6 months could not participate in the study, and alcohol use over the last 6 months was assessed retrospectively, which is subject to recall error. Self-selection into the study was also a weakness as those students who may drink larger quantities may have chosen not to participate. Next, the study assessed average drinking in general over the entire week, as opposed to binge drinking, which is known to occur more frequently among college students (Champion, Lewis, & Meyers, 2015). Additionally, if the study could have included non-drinkers, then there may have been significant differences with alcohol use among the CA and AI students. Furthermore, most AI participants reported residing in the Northern Plains geographic region of the country; therefore, results may not generalize to other parts of the country or other AI tribes. Lastly, the analyses were conducted on a small sample, particularly of AIs, which may have limited the power to detect significant results. A larger sample size may be needed to fully examine the role of cultural identification and alcohol use.

Future Research

Future research should examine differences in cultural identification and alcohol use among tribal college students who are on the reservation. This would allow for participants to be of similar socioeconomic status and would aid in understanding alcohol use and cultural identification differences among AIs. It may prove useful to examine differences in non-college samples of CAs and AIs (or other ethnic minorities) among those residing on or near the reservations to more completely understand differences in alcohol use between the groups. Lastly, future studies should also measure different types of drinking behaviors such as abstainers, low, moderate, heavy, and binge drinking among AI and CA college students. The optimal conditions for future studies should include balanced age, gender, sample size, and education level in order to make comparisons across groups. Research into these topics may highlight specific targets of intervention approaches to decrease problematic alcohol use among AIs.

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CONCLUSION

This study supports current research (Looby et al., 2017; Sargent, 2017) demonstrating AI college students are not drinking at higher rates than CA peers. Therefore, reinforcing the notion to separate AIs from stereotypes, such as the "drunken Indian." In addition, the study helps advance the understanding of the link between cultural identification and alcohol use among AIs, particularly those who identify as marginal, traditional, or assimilated. Furthermore, cultural identification was found to impact daily alcohol consumption rates between CAs and AIs. These findings suggest culturally targeted interventions to decrease students drinking may be beneficial, specifically for AI college students. Particularly, intervention strategies that seek to strengthen individuals' identification with their culture may be effective in preventing alcohol consumption.

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DRUG AND ALCOHOL POLICIES AT TRIBAL COLLEGES: A DESCRIPTIVE STUDY ASSESSING VARIATIONS IN ALCOHOL AND DRUG POLICY BY SETTING

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Abstract: This paper explores drug and alcohol policies at Tribal Colleges and Universities (TCUs). A research team conducted a needs assessment of Alcohol and Other Drug (AOD) use and policies in 27 TCUs, surveying key informants on perceived AOD prevalence. Student body size did not affect levels of AOD training or treatment. Larger TCU size increased the likelihood of on-campus housing, which increased the prevalence of zero-tolerance policies and greater access to AOD services. Reservation policies, local resources, and cultural practices did not appear to affect TCU AOD policies. Designed properly, these policies can support desirable academic outcomes for TCU students.

INTRODUCTION & BACKGROUND

Substance use among college students has long been a recognized public health priority. Among college students, 44.7% report episodic heavy drinking, an estimated 22% endorse current use of illicit substances, and 36% of students report use of illicit substances within the last year (Hingson, Zha, & Weitzman, 2009; SAMHSA, 2013; Dennhardt & Murphy, 2013). Alcohol and drug use among college students is associated with increased levels of high-risk behaviors and has been associated with risky sexual practices, poorer school performance, increased legal problems, and increased risk of subsequent substance dependence (Simons, Maisto, & Wray, 2010; Dennhardt & Murphy, 2013). An estimated 1,825 students die annually as a direct or indirect result of alcohol use, and greater than half a million experience significant morbidities including physical assault and poor school performance (Hingson et al., 2009; Hingson, Heeran, Winter, & Wechsler, 2005; Thombs et al., 2009). A great need for relevant treatment interventions exists, with studies

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indicating that as many as 20% of college students would benefit from substance abuse treatment (Weitzman, Nelson, Seibring, & Wechsler, 2005).

Alcohol remains a major public health concern in American Indian/Alaska Native (AI/AN) communities across the age demographic. Alcohol use can start long before college with studies among AI/AN students (grades 7-12) indicating that while behavioral trends (choice of substance, etc.) parallel those of the general student population, AI/AN students tend to use at a higher rate (Beauvais, Jumper-Thurman, & Burnside, 2008). In 2013, AI/ANs greater than 12 years of age had the highest rate of substance dependence or abuse among population groups and were noted to start drinking alcohol earlier, with eighth graders on or near reservations two to three times as likely to report having gotten drunk or participated in binge drinking (SAMSHA, 2014; Stanley, Harness, Swaim, & Beauvais, 2014). Once arriving at college, it has been noted that AI/AN college students reported greater rates of negative consequences associated with alcohol use when compared to their peers (Skewes & Blume, 2015). While understanding alcohol use in AI/AN populations is complex (for example, AI/ANs report higher rates of total alcohol abstention [59.9%] compared to whites [43.1%]; Cunningham, Solomon, & Muramoto, 2016), 10.7% of AI/AN deaths between 1999-2009 were related to alcohol, essentially triple that of the white population, with a separate 11-state study showing alcohol-related deaths resulting in higher rates of years of life lost than nearly any other population (Landen, Roeber, Naimi, Nielsen, & Sewell, 2014; Gonzalez et al., 2014). AI/ANs report the highest rates of meeting symptoms of alcohol abuse (5.8%) or dependence (6.4%) in the past year (Delker, Brown, & Hasin, 2016), and in states with higher populations of AI/ANs death rates due to alcohol-related cirrhosis are higher, on average (Hadland et al., 2015). With such a high burden of suffering and loss of life addressing the issues around alcohol use are crucial at every junction and age, including college students.

When considering the Tribal Colleges and Universities (TCUs) education network and the issue of alcohol and drug use among college students, it is important to contextualize the epidemiology and history regarding alcohol and drug use and AI/AN populations, as well as to understand the framework of TCUs. Established in conjunction with Tribal leadership and the needs of the AI/AN populations in mind, TCUs are institutions of higher learning aimed at providing education for AI/AN students from a supportive, culturally representative base (American Indian Higher Education Consortium [AIHEC], 2012). As of 2016, the TCU network within the United States included 37 colleges spread over 16 states, serving 80% of Indian Country. Individual TCU student enrollment ranges from 50 students to nearly 2,000, with variation in rural

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versus urban settings as well as on- and off-reservation locations. Institutions span the spectrum to include full-fledged universities and smaller scale community-based colleges. This network reaches approximately 19,000 students directly and an estimated 47,000 AI/AN community members indirectly through community education and support programs (AIHEC, 2012). However, developing a consistent understanding of alcohol use among AI/AN colleges students remains challenging, in part related to the limitations of available data.

Unfortunately, the views, concerns, and context of AI/AN peoples have frequently been absent from the conversations aimed at addressing substance abuse issues among AI/AN people (Beals et al., 2009). The right to enforce alcohol prohibition in Indian Country was only returned to tribal sovereignty in 1953 and varies greatly from Tribal Nation to Tribal Nation (IHS, 1999). Thus, while alcohol and other drug (AOD) use among AI/AN populations has long been a concern of public health, the actual use of substances among AI/AN people varies substantially among Tribal Nations and regions (Whitesell et al., 2012).

The Drug Free School/Communities Act of 1989 obligates secondary institutions to have an AOD prevention policy in place (Faden & Baskin, 2002). The Drug Fee Act added Section 1213 to the Higher Education Act requiring that, as a condition of receiving Department of Education funding or any other form of financial assistance under any Federal program, an institution of higher education must certify that it has adopted and implemented a drug prevention program (U.S. Department of Education, 2006). Colleges and universities across the United States vary in regards to policies surrounding substance use, particularly alcohol. It has been noted in at least one study that small colleges and universities are slightly more likely to have more prohibition policies than larger schools, but also that the specific permissive policies vary (Lenk, Erickson, Nelson, Winters, & Toomey, 2012). In one study, larger schools (enrollment > 2,500) were found to have more robust AOD screening in some cases as compared to smaller schools (enrollment < 2,500), but when the data was analyzed further, this tended to be school specific and related to certain types of encounters (mental health visits, court related, etc.; Lenk, Erickson, Winters, Nelson, & Toomey, 2012). In another study assessing 365 two-year and four-year colleges, only 20% reported any formal assessment of the implementation of their AOD policies (DeJong & Langford, 2002). However, studies assessing trends and issues surrounding AOD use, college policies, and enforcement of policies within the network of TCUs has been largely absent. Furthermore, because the policies regarding alcohol and drug use in Indian Country vary widely

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with tribal sovereignty and location, the governing Tribe associated with a given TCU may affect the AOD policies and enforcement context in a way that is unique to this network.

Desiring to address issues of AOD use and treatment as applied to TCUs, the Tribal Colleges and Universities: Drug and Alcohol Problems and Solutions Study (TCU-DAPSS) represents the first TCU-wide study aiming to assess the particular needs of TCUs in regards to drug and alcohol use for TCU students. Using a Community-Based Participatory Research Model and partnering with the American Indian Higher Education Consortium, university researchers and leaders from TCUs nationally built the surveys and framework for TCU-DAPSS as a three-phase project: Phase 1) completion of TCU-wide community needs assessment and acquisition of perceptions data regarding substance use at TCUs from students and faculty; Phase 2) epidemiologic study targeting student behaviors regarding substance use; and Phase 3) development of efficacious and appropriate interventions. The university researchers completed the first phase of data collection for this project in September 2012. This study represents a secondary analysis of the survey data collected.

Using the TCU-DAPSS perceptions data, this study provides a descriptive framework and preliminary understanding of the AOD policy-related data collected in the TCU-DAPSS study. TCU size as a possible predictor of AOD policies and resources for enforcement will be explored. Furthermore, it is hypothesized that the presence of on-campus housing may play a role in policy and enforcement patterns. Thus, how on-site housing connects to number of staff and AOD prevention resources will be examined in addition to questions regarding TCU size and reservation policy. Finally, accounting for the complex history of AI/AN populations and both Federal and Tribal AOD policies the relationship between reservation alcohol policy and nearby TCU AOD policies will be briefly described.

METHODS

This study is a descriptive secondary analysis of cross sectional perceptions survey data drawn from TCUs within the United States, plus one TCU in Canada. Students hail from over 250 Tribal affiliations with 76% of the students enrolled identifying as AI/AN. The TCU network is spread over 16 states (AIHEC, 2016); 27 of the 37 TCUs in the United States and Canada comprised the schools included in this study. Further demographics describing the TCU network from which

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this data was drawn are shown in Table 1 (see Appendix to compare several demographic measures for TCU-DAPSS participating schools compared to larger TCU population).

Table 1
Institutional Characteristics of Tribal Colleges and Universities (TCUs) that Participated in the TCU AOD Needs Assessment Study

Rural location** (*N* = 25)	*n*
Yes	22
No	3
TCU On or Near Reservation (*N* = 26)	
Yes	20
No	6
Highest degrees offered (*N* = 25)	
Associates	13
Bachelors	10
Masters	2
Percentage of TCU Students Completing Degree (*n* = 22)	Mean (*SD*)
Women	27.0 (23.6)
Men	17.1 (14.4)
AI/AN	23.6 (22.9)
Total	24.6 (22.9)
Annual Retention Rates, 2012 (*N* = 22)	
Full time students	51.3 (20.7)
Part time students	35.2 (27.2)

**Institutional level data where number of TCUs varies from field to field (n) due to availability of specific question data for the subset of TCUs included in this study.
AI/AN: American Indian/Alaska Native
TCU: Tribal Colleges and Universities
TCU AOD NAS: Tribal Colleges and Universities: Alcohol and Other Drugs Needs Assessment Study

A full IRB application for this study was submitted to the Principal Investigator's university. The content included details of the following sections: (1) Background and purpose of research; (2) Research procedures involved, including design, sequence and timing of procedures; (3) Human subject information, including target number, recruitment, and incentives; (4) Risks & benefits to participants; (5) Adverse events or effects; (6) Confidentiality of research data; and (7) Consent forms. The same detailed information was submitted to TCU IRBs or other approval bodies. In some cases, the consent form was tailored to include local or TCU contact information in the case of an inquiry or an adverse event.

With regard to approval processes, of the 27 TCUs in the study,

- 10 had their own TCU IRB
- 4 deferred to their tribal IRB
- 2 required approvals from both the TCU IRB and tribal IRB

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- 4 had tribal council / TCU board / committee approval
- 3 required the TCU president's or regents' approval
- 2 accepted the Principal Investigator's university IRB as their IRB-of-Record
- 2 accepted a different TCU IRB (Northwest Indian College IRB) as their IRB-of-Record

Three separate survey instrument questionnaires were developed by the university investigative team and a TCU Community Action Board comprised of administrators representing several of the largest TCUs. The questionnaires were developed for administration to 1) students, 2) faculty/staff, and 3) one key informant (usually an administrator) at each participating TCU. The questionnaires asked demographic and descriptive questions as well as explored perceptions of substance use patterns, availability, substances used, and TCU AOD policies and enforcement. As survey content changed and study procedures adjusted with input from TCU liaisons (through frequent, scheduled webinars), the investigative team sought and received IRB modifications or other approvals that reflected those changes from each TCU.

Participants were drawn from a sample of persons knowledgeable about their respective campuses and recruited by a designated TCU advocate from each TCU. A convenience-sampling model was used that helped to achieve high response rates. This study used the data from 27 TCUs that represented complete data collection with participation by the key informant, students, and faculty/staff. Five students, five faculty members, and one key informant from each TCU yielded a total of 340 responses from 27 participating schools, with a response rate of 61.5% for students (n = 112), 67.8% for faculty/staff (n = 228), and 96.3% for key informants (KI; n = 26). Questionnaires were administered to chosen participants in waves from November 2011 to September 2012.

Data analysis of the TCU-DAPSS perceptions data set was performed on both an institutional level (n = 27) and an individual participant level, depending upon the variable in question. For some variables, data from the KI questionnaire was collapsed to allow for analysis of variables at the institutional level (n = 27). There were several questions of interest for which there is missing key informant data (n = 25). Where this is the case, it is noted in the analysis.

TCU school size as an independent variable was based on institution enrollment and used as a continuous variable with enrollment numbers for the colleges of interest based on fall enrollment numbers from 2011, culled from the Integrated Postsecondary Education Data System (IPEDS) data set and showing a range in TCU size spanned from 58 to 2,319 students. When

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assessing the size of school versus presence of housing, the TCUs were grouped into categories based on size of total enrollment, in this case categories being < 400 students, 400-700 students, and 700-2,400 students. TCU size was also grouped by small (< 400 students) versus large (> 400 students) categories for some analysis, as noted in Table 4. Student-to-faculty ratio was also used as an independent variable related to school size and was culled from the IPEDS and AIHEC datasets and run against TCU-DAPPS variables of interest. For the purposes of some analyses, TCU AOD policy was analyzed as zero tolerance versus other policy (2-3 strikes, access/treatment, multiple, none), collapsing of all categories of TCU policy other than "zero tolerance" into the "other" category. Reservation policy was broken into categories for analysis according to type of tribal policy reported by the KI regarding the reservation the TCU was either on or nearest to. Policy categories were total prohibition, controlled access, legal consumption, and no policy. These were more simply categorized as total prohibition versus other to more broadly assess the effect of reservation prohibition policies on TCU variables of interest (collapsing all reported reservation policies other than "total prohibition" types into "other" category). For the several missing KI responses for TCUs on/near a reservation, the reservation policy was either categorized as "no policy" or independently verified through tribal documents where possible.

Statistical Analysis

Statistical methods were used to describe data at 1) institution-level or 2) individual student or faculty/staff-level of analysis. At the institution level, independent variables were initially looked at using bivariate relationships between policy, treatment, and funding variables of interest to examine whether a relationship existed between these variables. Due to the limited sample size in these analyses, many of the analysis provided chiefly descriptive statistics. When appropriate, Fisher's exact test for categorical predictor (e.g., housing) and one-way Analysis of Variance (ANOVA) for continuous predictor (e.g., size of institution) were used to determine if there was evidence to suggest a relationship between the predictor and dependent variable. For instance, we examined TCU AOD policy as a group variable using ANOVA to examine whether means differed by TCU policy group for a number of variables of interest.

Analyses using other statistical techniques were used when examining the relationship between size, housing, and the variables selected from the perceptions data collected at the individual-level including Pearson's chi-squared test for categorical and ordinal logistic regression with maximum likelihood estimation (where perceptions of AOD enforcement were assumed to

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be in the naturally ordered responses: 1) strongly enforced, 2) moderately enforced, or 3) weakly enforced or not enforced at all). Ordinal logistic regression was used to assess evidence for the possible relationship between enforcement perceptions and size of the institution. Additionally, in order to take into account the impact on the size of the standard deviations of potential non-independence of response within a given institution, clustered sandwich estimators were used when running regression analyses. All statistical analyses were performed using Stata 12.1 (StataCorp, 2011).

RESULTS

Size of TCUs

No relationships of significance were found to exist between TCU size and the variables of TCU policy type, AOD designated funds, presence of AOD treatment services, presence of health services, AOD training for staff, AOD information in student orientation, presence of outside AOD treatment services, and perceptions of AOD treatment (Table 2). Presence of housing for students did vary significantly by school size (p = 0.012), with more housing available at progressively larger schools (Table 3).

Table 2
Relationship of TCU Size to TCU Policy and AOD-Related Resources / Funding Using Analysis of Variance

	Fall 2011 Enrollment, Mean (*SD*)*	*p*-value (F-test)
TCU Zero Tolerance		0.17
No	402 (207)	
Yes	731 (674)	
Funding for AOD programs		0.83
No	589 (608)	
Yes	523 (122)	
TCU Health Services Counselor		0.36
No	528 (466)	
Yes	751 (718)	
Treatment Services		0.51
No	557 (599)	
Yes	734 (385)	
Any Trained AOD Staff		0.91
No	571 (586)	
Yes	651 (553)	
AOD included in orientation		0.22
No	702 (640)	
Yes	417 (304)	

continued on next page

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Table 2 Continued
Relationship of TCU Size to TCU Policy and AOD-Related Resources / Funding Using Analysis of Variance

	Fall 2011 Enrollment, Mean (*SD*)*	*p*-value (F-test)
Staff trained to identify AOD problems		0.58
No	643 (642)	
Yes	507 (306)	
IHS facility available		0.95
No	676 (529)	
Yes	667 (563)	

TCU: Tribal Colleges and Universities, AOD: Alcohol and Drug, IHS: Indian Health Services
*Enrollment numbers culled from IPEDS 2011

Table 3
On-Campus Housing Availability and Association with Size of Institution, as Measured by Enrollment

	Housing		*p*-value*
Size of School	No (*N* = 12)	Yes (*N* = 13)	0.009
<400	6 (50.0)	5 (38.5)	
400-700	6 (50.0)	2 (15.4)	
700-2400	0	6 (46.2)	
Mean Enrollment (*SD*)	370 (192)	811 (690)	0.012

*The significance of the statistical association was measured using Fisher's exact test for the categorized size, and by the F-test from one-way ANOVA to test for the difference in means.

Presence of Student Housing

There appeared to be no significant difference between on-campus housing and AOD designated funds, presence of health services, increased training for staff regarding AOD, inclusion of AOD education in student orientation, and number of staff dedicated to AOD issues (Table 4). However, relationships approaching significance existed between TCUs with on-campus housing and a higher number of zero tolerance policies (ten of the 13 schools with housing had zero tolerance policies as opposed to four of the 13 schools without housing) as well as on-campus housing and greater availability of TCU AOD treatment services (five of the 13 schools with housing reported presence of treatment services, whereas only one of the 13 schools without housing; Table 5). Similarly, the relationship between availability of AOD referral services and presence of housing and larger school size approached significance, suggesting increased likelihood of availability in these settings (Tables 4 and 5).

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Table 4
Relationship of School Size Category to TCU Policy and AOD Related Resources / Funding

	Size category of TCU (number of TCUs)		*p*-value*
	Small (<400 students) (*N* = 10)	Large (>400 students) (*N* = 15)	
TCU AOD Zero Tolerance Policy			1.00
No	4 (40.0)	5 (35.7)	
Yes	6 (60.0)	9 (64.3)	
Designated TCU funding for AOD programs			0.62
No	9 (90.0)	11 (78.6)	
Yes	1 (10.0)	3 (21.4)	
TCU Health Services Counselor			1.00
No	7 (70.0)	10 (66.7)	
Yes	3 (30.0)	5 (33.3)	
Treatment Services			0.35
No	9 (90.0)	10 (66.7)	
Yes	1 (10.0)	5 (33.3)	
Alcohol Referral Services			0.07
No	5 (55.6)	2 (14.3)	
Yes	1 (44.4)	12 (85.7)	
Any Trained AOD Designated Staff			1.00
No	3 (33.3)	6 (40.0)	
Yes	6 (66.7)	9 (60.0)	
AOD issues included in orientation			0.09
No	4 (40.0)	12 (80.0)	
Yes	6 (60.0)	3 (20.0)	

*Fisher's exact 2-sided test of significance

Table 5
Relationship of On-Campus Housing to TCU Policy and AOD Related Resources/ Funding

	On Campus Housing, *n* (%)		*p*-value*
	No (*N* = 13)	Yes (*N* = 13)**	
TCU AOD Zero Tolerance Policy			0.11
No	7 (58.3)	3 (23.1)	
Yes	5 (41.7)	10 (76.9)	
Designated TCU funding for AOD programs			0.32
No	12 (92.3)	9 (75.0)	
Yes	1 (7.7)	3 (25.0)	
TCU Health Services Counselor			0.20
No	11 (84.6)	7 (53.9)	
Yes	2 (15.4)	6 (46.2)	
Treatment Services			0.16
No	12 (92.3)	8 (61.5)	
Yes	1 (7.7)	5 (38.5)	
Alcohol Referral Services			0.07
No	6 (46.2)	1 (8.3)	
Yes	7 (53.9)	11 (91.7)	

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Table 5 Continued
Relationship of On-Campus Housing to TCU Policy and AOD Related Resources/ Funding

	On Campus Housing, *n* (%)		*p*-value*
	No (*N* = 13)	Yes (*N* = 13)**	
Any Trained AOD Designated Staff			0.43
No	6 (50.0)	4 (30.8)	
Yes	6 (50.0)	9 (69.2)	
AOD issues included in orientation			0.41
No	10 (76.9)	7 (53.9)	
Yes	3 (23.1)	6 (46.2)	

* Fisher's exact 2-sided test of significance
***n* = 13 for schools with housing; however, for several of the dependent variables, *n* = 12 due to missing data from the KI survey.

Reservation Policy

There did not appear to be any specific relationships of significance between types of reservation policy (prohibition, controlled access, legal consumption, no policy) and type of TCU AOD policy (zero tolerance, 2-3 strikes, access/referral, multiple; Table 6). Similarly, no relationship appeared to exist between the TCU AOD policy types and location on or off of a reservation.

Questions regarding bootlegging (illegal acquirement of alcohol), though not representing a formal TCU AOD policy, represents a possible policy influenced behavior at TCUs. There were no relationships of significance between student and faculty in regards to perceptions of bootlegging and TCU AOD policy. When perceptions of bootlegging were compared to reservation AOD policies, relationships suggesting less bootlegging where AOD policies are more lenient did appear significant among faculty ($p = < 0.005$). However, low student and faculty response ($n = 76$ and 161, respectively) as well as large response groups indicating "Don't know" ($n = 19$ and 27, respectively) in regards to the question make this difficult to interpret (Table 7).

Table 6
Relationship of TCU AOD Policy to Alcohol Policy of Hosting or Nearby Reservation

	Reservation Policy		
	Alcohol Prohibition Number of TCU (%)	**Alcohol Permitted** Number of TCU (%)	**p-value***
TCU AOD Policy			0.23
Zero Tolerance	7 (50.0)	3 (60.0)	
2-3 Strikes	3 (21.4)	0 (0.0)	
Access/Treatment	3 (21.4)	0 (0.0)	
Multiple	1 (7.1)	1 (20.0)	
None	0 (0.0)	1 (20.0)	

* Fisher's exact 2-sided test of significance

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Table 7
Relationship of Hosting/Nearby Reservation to TCU Student/Faculty Perception of Alcohol Bootlegging

	Reservation Policy		
	Alcohol Prohibition	**Alcohol Permitted**	**Chi-square**
	n (%)	*n* (%)	***p*-value**
Student Perceptions of presence of bootlegging (*N* = 76)			0.18
No	10 (55.6)	39 (67.2)	
Yes	4 (22.2)	4 (6.9)	
Don't know	4 (22.2)	15 (25.9)	
Faculty/Staff Perceptions of presence of bootlegging (*N* = 161)			<0.005
No	21 (51.2)	92 (76.7)	
Yes	14 (34.2)	7 (5.8)	
Don't know	6 (14.6)	21 (17.5)	

TCU: Tribal Colleges and Universities, AOD: Alcohol and Drug

Enforcement of Policy

Student perceptions of enforcement did not appear to vary with TCU enrollment numbers. However, at smaller TCUs, faculty perceived that TCU AOD policy was more strongly enforced. An increase of 100 students in size of institution resulted in odds being 1.06 (95% CI = 1.00, 1.10; p = 0.03) times greater that faculty perceptions of enforcement fell into a lower enforcement category (data not shown in table). Interestingly, this did not seem to correlate with a change in student-to-faculty ratio. However, this is complicated by the overall small spread of school sizes and significant standard deviations for each size category.

There appeared to be no relationship between presence of AOD-designated staff and perceptions of strength of TCU AOD policy enforcement by faculty. Furthermore, no significant relationships were noted between perceptions of enforcement strength and student-to-faculty ratio.

DISCUSSION

No relationship appeared to exist between size of TCUs and type of AOD policy in place, perhaps due to the diverse geographic locations as well as the overall size spread of TCU enrollment. Whereas it was predicted that smaller schools would be more likely to have zero-tolerance and stricter policies as a function of enforcement capacity, the data from other studies studying this trend among colleges do not necessarily apply to TCUs as the overall enrollment tends to be lower in addition to low numbers of TCUs total in the sample size. TCU enrollments lie in the 50-2,500 student range rather than the 500-25,000+ student enrollment variations seen in

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mainstream colleges and universities; thus, basically all TCUs would fall within the "small school" categories of other studies (Institution of Education Sciences, 2014).

Despite aforementioned limitations in interpreting TCU size as an independent variable, note that TCU size did not appear to clearly predict other potentially resource-bound variables, such as AOD-designated funds, presence of AOD treatment services, etc. More than illustrate differences in TCU size, this may suggest that access to necessary AOD intervention funding is a problem experienced by most TCUs, with more than 50% of nearly every AOD funding/staffing category analyzed indicating low resources or absence (Table 4).

This study suggested a significant relationship between size of TCUs and presence of on-campus housing with increasing availability as TCU size increased. This makes intuitive sense considering the need for housing to accommodate larger numbers of students, but introduces potential layers of policy in regards to housing rules, etc. that were not addressed in this study.

It was noted that TCUs with on-campus housing had a relationship approaching significance indicating that on-campus housing may be related to no-tolerance AOD policies and greater access to AOD treatment services. Again, this could be connected to the way in which resources are allotted at TCUs where on-campus housing is a priority and where more oversight of students at schools in which students spend 24-hours/day on campus is required (Table 5), though what was considered "treatment services" at each TCU is unclear given that formal treatment on any TCU is rare. Also, interestingly, in non-TCU studies, on-campus housing is actually associated with alcohol use, but often in the context of fraternities, sororities, and athletic teams (Tachine, 2015).

In one study of 52 mainstream colleges, the presence of substance-free residences (i.e., a ban on alcohol and tobacco) appeared to predict lower heavy alcohol use among those student residents and fewer secondhand negative effects when compared to students living in unrestricted housing (Walters, Simoni, & Evans-Campbell, 2002). However, restricted housing did not correlate with less overall alcohol involvement (Walters et al., 2002). How this applies to TCU housing situations is not yet clear.

No direct relationship appeared to exist between the AOD policies of the nearest reservation and that of the on-reservation or near reservation TCUs. Neither students nor faculty perceived a change in strength of policy enforcement based on the location of the TCU. Relationships between the lower rates of illegal acquirement of alcohol and more lenient reservation policy were suggested by the data, but only among faculty. This finding again would

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make intuitive sense in regards to access to alcohol, and to illegal procurement where it is unavailable legally, but may indicate interesting differences in faculty versus student perceptions and norms. Again, this data is somewhat difficult to interpret as the overall number of TCUs on reservations represents a small sample. Outside studies have suggested that local and state laws regarding AOD do affect college student use within that jurisdiction, for example, less binge drinking at colleges in states with stricter alcohol policy (Nelson, Naimi, Brewer, & Wechsler, 2005). Furthermore, reservation policy is a difficult variable to assess in this context as it varies from Tribal Nation to Tribal Nation. It is conceivable that variations in enforcement of even similar AOD policies may vary significantly by local resources, by cultural practices, and by geography (May, 1992; O'Connell, Novins, Beals, Spicer, & AI-SUPERPFP Team, 2005; Wood & Gruenewald, 2006).

Faculty appeared to feel that AOD policy enforcement was stronger and better applied at smaller schools, becoming progressively less confident in enforcement of policy as the TCU size increased. This was not true for student perceptions and did not vary with student-to-faculty ratio. This finding may represent a difference in faculty versus student perceptions of drinking norms, perhaps faculty at smaller schools feel better connected to students and more aware of the social context surrounding them. However, no relationship was noted between change-in-enforcement perceptions and student-to-faculty ratio, a postulated measure of faculty-to-student contact. However, it is still possible that unique characteristics of smaller TCUs endow faculty with more perceived insight into student AOD use patterns.

Interpreting student perceptions of norms regarding AOD issues is notoriously opaque; however, Bourgeois and Bowen (2001) note that college students frequently overestimate the drinking patterns of their peers and even tend to perpetuate perceived drinking norms that have no valid data supporting them. Having access to accurate information regarding college student drinking norms has been shown to affect drinking behavior, with misperceptions leading to increased drinking and accurate portrayals of norms predicting reduction in excessive drinking (Bourgeois & Bowen, 2001).

No relationship was found between TCU policy type and amount of AOD-designated funds and faculty. In many ways, this is consistent with the national pattern in which even where trained AOD staff are present, other staff have decidedly limited training in regards to recognition of AOD issues among their students (Bourgeois & Bowen, 2001). However, this lack of resources dedicated to staff who can identify and treat AOD problems with students is concerning as studies

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nationwide indicate that only 3.6% of students needing help seek it and that untreated AOD-related issues can carry serious negative outcomes (Caldeira et al., 2009).

TCUs have fielded criticism in terms of graduation/retention rates and their connection to federal funding, with some calling into question the success of the TCU strategy for making education more accessible to AI/AN students (Butrymowicz, 2014). However, TCUs offer educational opportunities within a cultural and, frequently, a regional context more familiar to many AI/AN students, one supportive of AI/AN heritage and culture and in a unique position to leverage community strengths. While only 12% of AI/AN young adults are noted to have completed a bachelor's degree (compared to 37% of white young adults), overall employment for this sector equaled that of their white peers (84% to 87%; Ross et al., 2012). Thus, access to higher education continues to be seen as an important social determinant for many AI/AN students, with renewed calls for root cause analysis of low retention rates and challenges for alternatives sounding out from TCU proponents (Tachine, 2015).

It has been suggested that indigenous models of AOD interventions focus less on individuality and more on the community aspects of AOD use, addressing underlying issues such as historical trauma and ongoing oppression (Walters et al., 2002). Thus, using a community-based participatory research (CBPR) approach can allow for harnessing of inherent community strengths. No TCU exists in a vacuum; thus, addressing the community aspect is a huge issue—making community-based approaches seem highly appropriate for TCUs (Radin et al., 2015). AOD prevention that involves more than just designated AOD staff is supported in the literature with studies in regards to AOD college policy suggesting that enforcement is most efficient when consistently practiced by many faculty (Tachine, 2015). Furthermore, TCUs may be a place where treatment can occur not only for students, but for their communities at large as this is a notoriously underfunded and underserved area (Dennis & Momper, 2012; Gone & Trimble, 2012).

One successful screening/intervention approach that has been developed at the University of Washington and is being adapted for other settings is the Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff, Baer, Kivlahan, & Marlatt, 1999). BASICS uses a harm reduction approach that centers around understanding the social norms related to AOD use among college students. This intervention shows significant promise for use in a CBPR model at TCUs and is in fact being adapted by the researcher for that purpose as part of the larger TCU study discussed in the introduction.

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Limitations

The TCU-DAPSS study is the first of its kind to study this educational network and started with gathering data from faculty and students about their perceptions of AOD issues on their TCU campuses. This sub-study looked specifically at how size of TCU, presence of on-campus housing, and AOD policies of the reservation that the TCU is on or nearest might affect TCU AOD policies and perceptions of AOD policy enforcement. Some of the interesting and unique characteristics of TCUs also made interpretation of the TCU-DAPSS data difficult. The overall limited spread in school size and number of schools made TCU size a difficult variable to draw strong conclusions about, while the rich and varied nature of different Tribal Nations and reservations make neat conclusions about reservation policy difficult. Also, because of the unique nature of TCUs, the data from TCU students may be less generalizable when compared to mainstream college students and campuses.

CONCLUSION

This limited study serves largely to promote thought and further study within the TCU network. Tribal Colleges and Universities represent a unique and important educational network within the United States—one rich with cultural and historical meaning as well as community influence. TCUs also represent an opportunity for many communities to promote learning of indigenous culture and values in a setting where educational opportunities have been either scarce and/or oppressive. AOD issues plague AI/AN peoples across North America, notably among AI/AN young people and college students. It is well established that AOD use can have negative consequences in terms of health and social damage as well as harder to measure losses such as future opportunity or community connections. Thus, addressing this issue as a factor in student success is crucial in improving and supporting AI/AN students and communities. However, noting that TCUs represent a unique educational system with traditionally smaller numbers of students and historical, regional, and cultural factors differing from other institutions, this study invites further thought on how to answer questions around AOD use among students within this network.

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APPENDIX

Institutional Characteristics of Tribal Colleges and Universities (TCU) that participated in Integrated Postsecondary Education Data System (IPEDs) Survey, 2011.

TCU Institutional Characteristics System-Wide (*N*=31)

	Mean (*SD*)
Percentage of TCU Students Completing Degree (2008 Cohort)	
Women	25.1 (22.0)
Men	17.3 (14.6)
AI/AN	22.2 (22.2)
Total	23.1 (23.1)
Annual Retention rates, 2010	
Full time students	49.4 (20.1)
Part time students	35.4 (26.0)

AI/AN: American Indian/Alaska Native
TCU: Tribal Colleges and Universities

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HEALERS NEED HEALING TOO: RESULTS FROM THE GOOD ROAD OF LIFE TRAINING

Allyson Kelley, DrPH, and Clayton Small, PhD

Abstract: Mental health professionals that work with American Indian and Alaska Native (AI/AN) populations are often viewed as ineffective because their professional training is based on a Western model of service delivery that is an extension of Western colonization. Research on effective training approaches for AI/AN mental health providers or mental health professionals that work with AI/AN populations is limited. The purpose of this study is to document the experiences and impact of the Good Road of Life (GRL) training on mental health professionals that work with AI/AN populations. A cross sectional mixed-methods design was used to answer the primary research question, "What is the impact of GRL training on mental health professionals who work in American Indian communities?" We used GRL ratings, self-reported impacts, knowledge gains, and pre-post Sources of Strength scores. Self-reported mean knowledge scores increased for all topics. Daily evaluations indicate that most participants felt more positive, knew more about the impacts of sobriety, and knew how to help a suicidal person. Sources of Strength mean scores increased in the following areas: confidence, belonging, historical trauma, using strengths to overcome difficulties, spiritual practices, resolved unhealthy relationships, and use of cultural resilience. Results indicate that GRL is an effective short-term training for professionals working in the mental health field throughout Indian Country.

INTRODUCTION

More than 68% of American Indian and Alaska Native (AI/AN) people live on or near Indian reservations, villages, or tribal lands, and 54% of AI/ANs live in rural or small-town areas (Dewees & Marks, 2017). These areas are often characterized by limited behavioral health resources and greater behavioral health needs. In the general U.S. population, AI/ANs are considered a minority; they experience lower incomes and poverty and have significant mental health needs due to historical, intergenerational, and present-day traumas (Brave Heart, Chase, Elkins, & Altschul,

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2011). Racial and ethnic minorities, along with low-income groups in rural areas, are the most impacted by a growing shortage of mental health professionals[1] (Riding-Malon & Werth, 2014). A report by the New Freedom Commission on Mental Health found that more than 85% of the federally designated mental health professional shortage areas are rural (Riding-Malon & Werth, 2014), and AI/ANs in these areas are disproportionately impacted by the shortage of mental health professionals. AI/ANs have faced substantial behavioral health needs and continue to experience a growing mental health crisis that is compounded by the lack of mental health professionals and limited services (Health Resources & Services Administration, 2019). Previous research calls attention to the barriers that prevent racial and ethnic communities from accessing and receiving mental health services (U.S. Department of Health and Human Services [USDHHS], 2006). These barriers include stigma around mental illness; feelings of shame and discrimination; lack of insurance or underinsured status; ineffective communication by providers; and cultural attitudes, beliefs, values, and expectations (USDHHS, 2006). For some AI/ANs, another barrier is the feeling that mainstream mental health services are largely ineffective because they are not based on indigenous ways of knowing and fail to address these dimensions of well-being and health, such as spiritual, physical, mental, and emotional (Hodge, Limb, & Cross, 2009).

Research shows that high rates of suicide, substance abuse, social problems, and other mental health problems are related to cultural oppression and marginalization that AI/AN groups have experienced (Kirmayer, Simpson, & Cargo, 2003). Historical traumas have impacted past and future generations. AI/AN populations experienced social and cultural disruption, through the institutions of boarding schools, forced relocation programs, genocide, and punishment for speaking Native languages and practicing ceremonies. There is an emerging body of literature that supports practicing culture as treatment (Gone, 2013; Gone & Calf Looking, 2011). Cultural practices as a form of treatment may include regalia making, using indigenous language, practicing generosity and healthy relationships, participating in ceremonies and spiritual practices, and numerous other components of culture. The rationale for using culture as treatment is that culture reconnects AI/AN people to their identity, spiritual practices, traditional knowledge base, values, ceremonies, kinship systems, and healing practices (Gone, 2013; Kirmayer et.al, 2003). With the colonizing history of AI/ANs in the United States, and the distrust of Western therapeutic approaches, providers working with AI/AN populations must be knowledgeable about historical trauma and the significance of cultural practices

[1] In this paper, we use the term "mental health professionals" to encompass providers of support, prevention, and therapy services.

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as a form of treatment (Whitbeck, Adams, Hoyt, & Chen, 2004). For these reasons, training efforts are needed that increase provider responsiveness to culture and trauma.

Research on training AI/AN mental health providers or individuals who treat AI/AN clients is somewhat limited. Most research either documents the prevalence of mental disorders, calls for more culturally responsive service provision in a general way, or documents gaps in existing services. For example, Hodge and colleagues (2009) report that AI/ANs view mental health services as ineffective. Walls and colleagues (2006) conducted a study with tribal members from four reservations, and they found that mental health and substance abuse services provided by professional service providers were not effective. This same study found that when mental health providers lived off reservation, they were ranked as the least effective of all 21 professional services evaluated (Walls, Johnson, Whitbeck, & Hoyt, 2006). In another study, LaFromboise (1988) found that non-Native psychologists often try to impose their values on AI/ANs and called for more providers to become familiar with the mental health provision process in Indian Country. Gone and Trimble (2012) call attention to the staffing and funding issues of federal programs like the Indian Health Service. With limited resources and services, mental health problems among AI/ANs have exceeded the resources available on reservations and tribal lands (Gone & Trimble, 2012). In sum, the current research on AI/AN mental health services indicates that one reason why existing services are ineffective is that they are based on a Western model of service delivery that is an extension of Western colonization. The Western model is plagued with challenges such as infrastructure, financing, and research. Institutional racism and discrimination contribute to ineffectiveness, where cultural practices, traditions, and spirituality are not valued as they should be (Findling et al., 2019). Interventions that increase mental health professionals understanding of the role of historical trauma through provider training is necessary to build effective mental health services.

This study focused on the Good Road of Life (GRL) training. It presents an example of a culturally relevant training model that supports mental health and related workforce professionals in understanding and responding to efforts to heal from historical and intergenerational trauma.

Good Road of Life

The GRL training was developed for Native people who are faced with extraordinary challenges and who may have lost the sacred connection to their cultural identity due to colonization and racism (Small, 1996). Developed by Dr. Clayton Small in 2007, the GRL training has been implemented in more than 20 states, reaching more than 15,000 participants. GRL draws upon

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similar concepts from the Gathering of Native Americans (GONA) by promoting hope, encouragement, and skills that support indigenous community action and advocacy. Similar to the GONA framework, GRL promotes building relationships, building skills and the concept of mastery, working together and interdependence, and promoting commitment and generosity (Chino & DeBruyn, 2006). GRL is used by federal agencies such as the Substance Abuse and Mental Health Services Administration, the Indian Health Service, and the Administration for Native Americans. Uses of the GRL curriculum vary, with adaptations for youth, family members, Native men, and organizations. Local unpublished evaluations have documented the effectiveness of GRL across populations, states, and age-groups; however, this is the first publication of GRL evaluation results that utilizes descriptive statistics to explore differences in pre and post knowledge scores among tribal professionals.

GRL is a culture- and resilience-based curriculum designed to use the sources of strength that Native people have, including spirituality, culture, and humor, to assist in the development of personal wellness, leadership, healthy relationships, and family preservation. The GRL curriculum is supported by a 225-page training manual that each participant receives and uses throughout the training. Training is offered over a 3-day period and approximately 18 hours. Chapter topics include the following: norms, curriculum overview, clan formation, colonization and racism, multigenerational trauma and breaking unhealthy cycles, sobriety, hostility and anger management, domestic violence, healing, forgiveness, grief, suicide prevention, sexual orientation, conflict resolution and healthy communication skills, and developing a personal wholeness plan for returning home. Interactive activities support GRL outcomes and include presentations, icebreakers, skits, group discussions, talking circles, and hands-on activities.

GRL Expected Outcomes

The GRL curriculum was designed to achieve seven outcomes.

- Improve skills to overcome barriers and deal with stress for workers
- Increase worker knowledge about cultural resilience using culturally appropriate activities
- Increase worker knowledge about communication and conflict resolution skills that strengthen relationships
- Increase worker knowledge about suicide risk factors by offering prevention education and awareness

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- Provide peer counseling skills for workers that support each other's wellness and facilitate friendships
- Increase leadership skills of workers
- Empower workers to make healthy decisions

With the growing need to strengthen the mental health workforce effectiveness, this study documents the experiences of mental health professionals who attended a GRL training December 14-16, 2018 in Albuquerque, New Mexico. GRL was intended to be a healing exercise for mental health professionals attending the training and a knowledge building activity that would increase understanding about culture and historical trauma in AI/AN communities. The GRL training was based on the assumption that providers need healing too, and the GRL training would give providers an opportunity to heal while developing new skills that they could use with the population they work with. GRL was delivered as planned, without changes in topics or activities to accommodate any non-AI/AN professionals who attended the training. In some cases, non-AI/AN professionals listened and learned about culture and historical trauma, some for the first time.

The first objective of our study was to document the satisfaction among GRL participants—this was particularly important because it was the first time we had offered the training for AI/AN mental health professionals and mental health professionals that serve AI/AN communities. This objective supported our research question, "What is the impact of GRL training on mental health professionals who work in AI communities?"

METHODS

Recruitment

Native Prevention Research Intervention Development Education (PRIDE) is a an American Indian non-profit organization committed to implementing cultural and spiritual based programs that inspire wellness, healing, leadership, and changes for individuals, families, communities, and organizations (www.nativeprideus.org). Native PRIDE is the organization that designed, implemented, and evaluated the GRL training. A five-member tribal community advisory board oversees all aspects of Native PRIDE outreach and training efforts using principles of community based participatory research (CBPR) including shared decision-making and ownership in the design and evaluation process (Kelley, Piccione, Fisher, Matt, Andreini, & Bingham, 2019). Native PRIDE offers GRL trainings in schools, communities, and organizations

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throughout Indian Country. For this study, Native PRIDE recruited participants using fliers, email communications, website, advisory board members, outreach to tribal mental health professional organizations, Indian Health Service, and in-person communications. Eligibility was not limited to AI/ANs or a specific geographic area; any mental health professional working in tribal communities was welcome to attend. Consistent with tribal values of inclusion and generosity, Native PRIDE trainings are open to rural, urban, frontier, and non-Native groups.

Evaluation Design

We used a cross sectional, mixed-methods study design to answer our primary research question. The following data sources were used: Sources of Strength Inventory pre and post scores, participant demographic information, and GRL daily evaluations. All data were collected in-person using paper and pen survey methods. Native PRIDE collected daily evaluations at the end of each training day. Upon completion of the evaluation, participants were given a raffle ticket and had the chance to win gift cards, traditional foods, and artwork. Verbal consent was obtained from all individual participants, and all GRL participants were invited to participate in the daily evaluations, although it was not required.

GRL Daily Evaluations

Native PRIDE developed daily evaluations to measure knowledge increases in topics presented, the quality of presentations and presenters, and how meaningful session activities were to participants. These evaluation tools and the Sources of Strength survey were developed by Dr. Clayton Small as part of his dissertation in 2007. The Sources of Strength survey has been adapted for other age groups and trainings by Native PRIDE (Kelley & Small, 2016). The first section of the daily evaluation included three questions that addressed the quality of presentations and presenters. The first question asked, “Was the program easy to follow and understand?”. Response options were No, Not Sure, or Yes. The next two questions asked about facilitators and activities, “The facilitators were organized, knowledgeable, and supportive” and “The session activities were meaningful and relevant to me.” Response options for these questions were based on a 5-point Likert-type scale where 1 = Strongly Disagree and 5 = Strongly Agree. The next section included a set of questions that used a retrospective design to document knowledge changes as a result of the GRL training. We asked participants to circle

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their level of knowledge of a topic before and after the training using a 10-point scale where 1 = No Understanding and 10 = Complete Understanding. Topics varied based on the content presented each day and included: colonization, spirituality, historical trauma, grief and loss, forgiveness, healthy relationships, sobriety, suicide prevention, and conflict resolution. The next question asked, "How did the GRL training impact you?" and participants were instructed to select from a list of responses that applied to them. Response options were linked to content and previous work. Day 1 response options were "I feel more positive," "I feel more hopeful," "I understand the impact of colonization," "I feel more connected to my spirit," "I understand the impact of historical trauma and racism," and "I was not impacted." Day 2 response options were "I feel more hopeful," "I feel more positive," "I know more about healthy relationships," "I understand more about grief and loss," "I know how to forgive and why it is important," and "I was not impacted." Day 3 response options were, "I feel more hopeful," "I know why sobriety is important," "I feel more positive," "I know how to help someone who is suicidal," "I can use conflict resolution skills," and "I was not impacted."

Sources of Strength Pre- and Post-Survey

Our team administered the 14-item Sources of Strength (SOS) survey to document changes in strengths on the first day of the GRL training and on the last day of the GRL training. The survey was designed to assess constructs related to healthy relationships, communication, confidence, belongingness, historical trauma, generational trauma, addictions, spiritual practices, sexual orientation, cultural, and resilience. The SOS has been used with Native populations with a high degree of reliability and validity (Kelley & Small, 2016). SOS response options were based on a Likert-type scale where 1 = Strongly Disagree and 5 = Strongly Agree.

Analysis

We entered daily evaluations and the SOS responses into SPSS version 24.0. Our team calculated mean scores and standard deviations for each item. We calculated descriptive statistics for all items. Next, we used a paired *t*-test to compare pre and post mean knowledge scores. We used an independent samples *t*-test to compare pre and post mean SOS scores. All evaluations were included in the analysis, including those with missing data. Results were reviewed and validated by the Native PRIDE team and individuals that attended GRL.

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FINDINGS

There were 77 GRL participants total, and the daily evaluation response rate overall was 85.2% and varied by day (Day 1 = 88.3%, Day 2 = 83.1%, Day 3 = 84.4%). Table 1 summarizes the demographics of the GRL participants. Most were female (63.7%). The average age was 41.3 years (*SD* = 12.85). Tribal affiliation varied, and all but two of the participants were AI/AN. Most participants were clinicians working in mental health (51.5%), and their roles varied from clinical social worker or therapist to clinical director. Others (17.6%) worked in prevention programs related to substance abuse and mental health in tribal communities. Some worked in public health roles supporting mental health in positions such as coordinators, trainers, and community health (14.7%). The majority of GRL participants worked in rural communities in Washington, New Mexico, North Dakota, Utah, Oklahoma, Oregon, Arizona, New York, and South Dakota.

To answer the primary research question, "What is the impact of GRL training on tribal mental health professionals who work in AI communities?" we used GRL ratings, self-reported impacts, knowledge gains, and pre-post SOS scores.

Table 2 outlines the results of the first three questions related to the program, organization, and session activities.

Table 1
Demographics of GRL Participants

Demographics	Percent	*n*
Gender (*n* = 69)		
Male	36.2	25
Female	63.7	44
Race/Ethnicity (*n* = 69)		
AI/AN	95.7	66
Non-AI/AN	2.9	2
Missing	1.4	1
Profession (*n* = 69)		
Prevention	17.6	12
Public Health	14.7	10
Clinician	51.5	35
Cultural Specialist	5.9	4
Law Enforcement	4.4	3
Educator	4.4	3
Missing	2.9	2

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Table 2
GRL Ratings and Response Rates for Facilitators, Content, and Session Activities

Question	Percent Responding Yes	*n*
Was the program easy to understand?		
Day 1 (*n* = 69)	91.3	63
Day 2 (*n* = 69)	98.5	66
Day 3 (*n* = 65)	93.8	61
Were the facilitators organized, knowledgeable, and supportive?		
Day 1 (*n* = 69)	98.5	68
Day 2 (*n* = 100)	100	67
Day 3 (*n* = 65)	93.8	61
Were the session activities meaningful and relevant?		
Day 1 (*n* = 69)	82.6	57
Day 2 (*n* = 67)	94.0	63
Day 3 (*n* = 65)	89.2	58

Table 3 documents the mean knowledge scores before and after the GRL training from daily GRL evaluations. There was a statistically significant increase in knowledge reported before (M = 66.16, SD = 11.33) and after (M = 77.57, SD = 11.84) the training based on all topics presented, t(-12.54), p < .000, CI .95-13.23, - -.9.58. Further, Cohen's effect size value (d = .98) suggested a high practical significance (Cohen, 1988).

Table 4 highlights participant responses on how the training impacted them using fixed multiple-choice response options based on the topics presented and the intended outcomes. Results indicate that the GRL training increased the positivity of participants and increased knowledge of forgiveness, healthy relationships, spirituality, sobriety, and responding to someone who is suicidal.

Table 5 summarizes the SOS mean scores pre and post (before and after the GRL training). There was a statistically significant increase in SOS scores on all topics presented, before training (M = 60.81, SD = 4.63) and after training (M = 62.80, SD = 5.40) t(1.98), p < .05, CI .95, -3.9- .0024. Further, Cohen's effect size value (d = .39) suggested a small to medium practical significance (Cohen, 1988). The attendees reported increases in several areas of strength: feeling confident to deal with life stressors, sense of belonging to community and people, understanding the impact of historical trauma and racism, use strengths to overcome addictions and unhealthy behaviors, strong spiritual practices for healing and wellness, resolving unhealthy relationships, and use of culture to overcome challenges.

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Table 3
Self-Reported Mean Knowledge Before and After GRL Scale (1-10)

Topic	Before Knowledge	After Knowledge
Impact of Colonization (*n* = 69)	7.28 (SD=1.84)	8.48**(SD=1.33)
Spirituality (*n* = 69)	8.23 (SD=2.22)	9.26**(SD=1.58)
Historical Trauma (*n* = 69)	7.73 (SD=2.06)	8.80**(SD=1.28)
Grief and Loss (*n* = 62)	7.36 (SD=1.88)	8.89** (SD=1.33)
Forgiveness (*n* = 62)	7.53 (SD=2.06)	9.08**(SD=.93)
Healthy Relationships (*n* = 62)	7.50 (SD=1.8)	9.06**(SD=1.0)
Sobriety (*n* = 62)	8.22 (SD=1.64)	9.30**(SD=.91)
Suicide Prevention (*n* = 62)	7.88 (SD=1.75)	9.17**(SD=.87)
Conflict Resolution (*n* = 62)	7.87 (SD=1.96)	9.34**(SD=.84)
Overall Mean Knowledge **Score**	66.16 (SD=11.33)	77.57**(SD=11.84)

**p<.01

Table 4
Impacts of GRL on Participants

Highest Impacts	Percent	*n*
Day 1		
More positive	79.7	55
More hopeful	62.3	43
More connected to spirit	59.4	41
Day 2		
More positive	85.4	57
Know how to forgive /importance	80.6	54
Know healthy relationships	77.4	52
Day 3		
More positive	93.5	61
Know importance sobriety	87.1	57
Know how to help suicidal individual	87.1	57

Table 5
SOS Mean Scores Pre and Post

Constructs	Before SOS Mean	After SOS Mean
Satisfaction	3.44 (SD=.71)	3.44 (SD=1.0)
Relationships	4.00 (SD=.46)	4.00 (SD=.41)
Seek Support	3.96 (SD=.79)	4.02 (SD=.78)
Resolve Conflict	4.05 (SD=.45)	4.02 (SD=.55)
Confident	4.09 (SD=.61)	4.30* (SD=.55)
Belonging	4.09 (SD=.72)	4.38** (SD=.52)
Historical Trauma	4.09 (SD=.55)	4.30* (SD=.55)
Generational Trauma	4.14 (SD=.58)	4.23 (SD=.66)

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Table 5 Continued
SOS Mean Scores Pre and Post

Constructs	Before SOS Mean	After SOS Mean
Use Strengths to Overcome	4.18 (SD=.57)	4.47** (SD=.50)
Spiritual Practices	4.08 (SD=.73)	4.36* (SD=.63)
Resolved Unhealthy Relationships	3.88 (SD=.65)	4.14** (SD=.58)
Understand Depression and Suicide	4.20 (SD=.53)	4.26 (SD=.44)
Understand Sexual Orientation	4.04 (SD=.53)	4.24 (SD=.48)
Use Culture Resilience	4.19 (SD=.58)	4.40* (SD=.58)
Use Culture Overcome Challenges	4.21 (SD=.59)	4.35 (SD=.57)
Overall Mean SOS Score	60.81 (SD=4.63)	62.80* (SD=5.40)

**p<.01, *p<.05

Limitations

Evaluations show a high-level of satisfaction, positive impacts, and increases in sources of strength and self-reported knowledge scores—but these must be interpreted with caution. First, results may not be generalizable to other populations. Participants were recruited using convenience sampling methods and results only reflect the responses of participants able to attend the training. The small sample of participants and the lack of a control or comparison group limit the evaluation findings. Second, the retrospective evaluation design is based on self-reported knowledge gains and how participants feel their knowledge increased as a result of the training. Third, participants were from diverse mental health profession backgrounds and how we defined mental health professionals is unique to this training and population. For example, prevention specialists, public health specialists, law enforcement, and educators were classified as working in the mental health field, but just over half of the participants were clinicians. This is a unique classification for working in tribal communities, where mental health, spiritual health, physical health, and emotional health is viewed holistically, and therefore professionals working beyond the mental health field are asked to fulfill various healing and helping roles in their communities. Finally, the use of an independent *t*-test of the SOS scores from participants was required because not all participants completed the follow-up SOS survey.

DISCUSSION

Results from this evaluation document significant positive impacts on tribal mental health professionals who work in rural and tribal communities throughout the United States. Results also

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demonstrate a high-level of satisfaction with the GRL training, session activities, and facilitators.

GRL increased the strengths of AI/AN mental health professionals. The greatest increases in strengths that were statistically significant include: feeling confident to deal with life stressors, sense of belonging to community and people, understanding the impact of historical trauma and racism, use strengths to overcome addictions and unhealthy behaviors, strong spiritual practices for healing and wellness, resolving unhealthy relationships, and use of culture to overcome challenges. Trainings like GRL help professionals feel more positive about the future and increase their coping skills and availability to help others in need. Participant evaluations indicate that the training's biggest impact was helping them to feel more positive, and this is likely the result of the relationships that are developed, the skill building and exercises that participants engage in, and the atmosphere of the training that promotes acceptance, healing, and friendships.

From this training, and our collective experiences, we offer four lessons learned, designed to contribute new knowledge about supporting mental health professionals throughout Indian Country.

First, mental health and clinical professionals can benefit from a cultural and community-based approach to therapy. This means getting out of the office and into the community when trainings like GRL are available. In doing this, they are visible to the community and are part of the community. Unless there are relationships established outside of the clinical office, there is limited trust established, and professionals will continue to be viewed as outsiders with limited effectiveness. A GRL mental health professional from Rosebud Sioux said, "You are not just doing this for yourself. You are doing this for everyone, your family, friends. You take your teachings and share these wonderful things. You tell them everyone can do this."

Second, we cannot give what we do not have. In the healing profession, this means that healers are healed, or at least have coping skills available so that when traumatic or stressful events arise, they will be able to deal with the situation in a healthy way. A GRL prevention specialist from the Pawnee Nation wrote this about the workshop, "The aspects of dealing with loss and dealing with shame, those have been the biggest for me personally. In my mind, you think about loss of family. But I have been going through a loss of hope and a loss of faith. I have learned how to heal."

We believe that understanding the unique trauma histories of AI/AN populations is a first step in being an effective mental health professional working with AI/AN populations. Understanding trauma histories requires that professionals have recovered from their own traumas and that they understand the healing process from an indigenous perspective.

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Third, forgiveness is a powerful healing tool available to all. Part of the GRL training focuses on forgiveness, and we have found that professionals have more difficulty forgiving themselves than others. Self-care, self-forgiveness, and self-love are powerful when mental health professionals engage in these practices. A peer recovery specialist with the lived experience of recovery from the Seneca Nation reinforced the need for this training, regardless of professional status in the community: "It should be the same training for everyone, regardless of position." This quote is powerful because it reinforces the concept that healing and forgiveness is not just for individuals in need or crisis, but for everyone. It does not matter what position they hold or the qualifications and training that they have.

Fourth, we must find ways to continue the training and skill building beyond GRL. A GRL mental health professional from New Mexico reinforced this recommendation:

> This training is a great building block for everyone that is trying to better themselves in their own areas and lifestyles. We all need building blocks. Like the four directions, there are building blocks in all directions and it is a continuous life circle, you can use anyone of those to build self-up. Programs like this help you study those directions and keep your learning circle going, building higher, higher, and higher.

When you open the door for healing from trauma, it is a process that requires a lot of follow-up. There is a need for transitional environments so that when professionals go back to the workplace carrying the feelings from the training, they have a resource and support system available.

CONCLUSION

Psychological distress, mental health problems, and substance abuse stem from the lingering effects of colonization (Gone, 2013). The GRL training is an example of a culturally based mental health professional training that increases knowledge of the underlying causes of mental health problems that AI/AN communities experience.

This GRL evaluation has taught us that healers need healing too. Findings from this study indicate that GRL may be an effective training for professionals working in the mental health field throughout Indian Country. By expanding training to mental health professionals, from different backgrounds and disciplines, it is possible to grow the capacity of AI/AN communities to address the mental health professional shortage while increasing the effectiveness of professionals through understanding of historical trauma and culture. Additional research is needed to explore the

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effectiveness of GRL on mental health professionals and the translation of skills and knowledge into practice settings. Continued efforts are needed that address the disproportionate impacts of colonization and trauma that AI/ANs experience; the GRL training offers culture-based teachings, resilience, healing, and hope for mental health professionals working with AI/AN populations.

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RESILIENCE AND STRESS AMONG HOPI FEMALE CAREGIVERS

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Abstract: Resilience and stress are important factors in the caregiving experience, but research has yet to examine their association among American Indian (AI) caregivers. This study examines resilience and stress in a group of Hopi female caregivers. Data came from the Hopi Adult Caregiver Survey (2017), which conducted interviews with 44 Hopi women who were providing care without remuneration to an adult family member. Measures included the abbreviated Connor-Davidson Resilience Scale (CD-RISC-10), the Perceived Stress Scale (PSS-10), and questions about caregiver characteristics, care recipient characteristics, social support/ community support, and cultural factors. Stress and resilience were looked at above the median (higher stress or higher resilience) and below the median (lower stress or lower resilience). Caregivers who reported relatively lower resilience were more likely to report that they lived separately from their care recipients and that all Hopis are expected to be caregivers. Caregivers who reported relatively higher stress reported a higher total number of caregiver difficulties, a poorer self-perception of their own health, use of a traditional healer in the past 5 years, and that females are expected to be caregivers. A regression analysis adjusting for age, education, and employment status indicated that higher resilience among the caregivers was significantly associated with lower stress. In light of these findings, programs working with AI caregivers may wish to explore whether supporting the resilience of these caregivers is a means towards limiting their stress.

INTRODUCTION

In the United States, informal caregivers provide unpaid care that amounts to paid care services that would cost between $470-522 billion annually (Family Caregiver Alliance, 2019; Hopps et al., 2017). Maintaining the health of this 'workforce,' consequently, is important. That said, 38% of caregivers in the U.S. general population consider their situation to be stressful (National Alliance for Caregiving, 2015), a concern as stress can challenge a caregiver's health

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and threaten their ability to care for family, friends, and community members suffering from issues ranging from cancer to dementia. Caregiver stress and the factors affecting it has become an important area of analysis, particularly as the US population is now aging. But little such analysis has been conducted for one of the country's major racial/ethnic groups—American Indians (AI). A few studies that have examined stress among AI caregivers (specifically Southwestern and Northern Plains AI caregivers) report that stress is a caregiving difficulty (Jervis et al., 2010; Cordova et al., 2016; Cordova-Marks et al., 2018). But no caregiving studies have looked specifically at related factors such as resilience among AI caregivers, an important gap as resilience is thought to help counter stress among caregivers (Palacio et al., 2020).

Resilience has been defined as "[P]ositive psychological, behavioral, and/or social adaptation in the face of stressors and adversities" (Dulin et al., 2018, p.57), and similarly as "[T]he ability to successfully cope with change or misfortune" (Ahern et al., 2006, p.104). In a recent review of caregiving, Palacio et al. (2020) concluded that resilience can help limit the risk of stress and burden that caregivers often face. For example, in a study of caregivers for persons with Alzheimer's disease, Lopes da Rosa et al. (2020) found that resilience helped the caregivers manage and respond positively to the stressful demands of care. This is consistent with studies on resilience and stress in general, which have found, for example, that resilience is associated with lesser stress among university students, corporate level executives, medical patients and their spouses in the United States, and international medical patients (Bacchi & Licinio, 2017; Kermott et al., 2019; Lim et al, 2014; Tian et al., 2016).

While dozens of studies have reported on the association of resilience with stress (Palacio et al., 2020), no studies have yet examined these two variables among AI caregivers. Here, we examine resilience and stress as reported by Hopi female caregivers. This is the first study to examine both factors in an AI tribe. We also examine possible related factors such as the characteristics and experience of caregivers and the characteristics of the persons receiving care. Note that not all tribes are similar and the diversity among tribes can be substantial. This study on Hopi female caregivers will provide a starting point for other tribes to look at caregiver resilience and stress among their own populations.

METHODS

Data for this study were drawn from the 2017 Hopi Adult Caregiver Survey, which has been previously described (Cordova-Marks et al., 2018). This 58-item survey included questions

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about caregiver characteristics, caregiver experience, and the persons receiving care (care recipients). Caregiver characteristics included age, education, employment status, marital status, number of adults in the home, and number of children in the home. Questions related to the caregiving experience included their reason for becoming a caregiver, types of caregiving duties, amount of time devoted to caregiving (total years and hours/week), caregiver difficulties, and the caregivers' perceived health status, resilience, and stress. Caregivers also answered questions about the care recipients, including their age, health conditions, relationship, and aspects of culture they participate in. Questions related to culture and tradition (language spoken at home, use of traditional healer, attending ceremonies) were also asked, as culture and tradition can bear on familial/community behavior in AI tribes.

As part of the Hopi Adult Caregiver Survey, resilience and stress were assessed using the abbreviated Connor-Davidson Resilience Scale (CD-RISC-10) and the Perceived Stress Scale (PSS-10; Campbell-Sills & Stein, 2007; Connor & Davidson, 2003; Cohen et al.,1983). The CD-RISC-10 and the PSS-10 have both been used in prior research with AIs. Goins and colleagues (2013) used the CD-RISC-10 with AIs and found it to be reliable. Other studies with mixed samples have assessed the validity of the PSS-10 (Bersamin et al., 2014). Both instruments have ten items. For each instrument, individual items are scored from 0-4 and summed to a final score with a possible range of 0-40. (In the present study, one modification was made to the CD-RISC-10: "humorous" was changed to "funny" for Question 3 of the CD-RISC-10 per a suggestion from a member of the Hopi tribal council. Higher scores on the CD-RISC-10 and PSS-10 indicate greater resilience or greater stress, respectively.

Eligible participants were self-identified Hopi caregivers 18+ years of age who lived on the Hopi reservation (located in northeastern Arizona) and provided care without pay to an adult family member due to that member's health condition, disability, or older age. Persons that provided care for a child only were not included. Participants were recruited from the Hopi Office of Aging and Adult Services' (HOAAS) list of caregivers and via an advertisement placed in the local newspaper, the Hopi Tutuveni (inclusion and exclusion criteria were included in this advertisement). A Hopi interviewer that has conducted surveys on past Hopi-related survey projects, such as the 2012 Hopi Cancer and Chronic Disease survey, was trained by the project's principal investigator to administer the questions. This interviewer conducted all surveys in person at participants' homes or the Hopi Nutrition Center, depending on the participant's preference. Participants were given the option of having the survey conducted in Hopi or English (the

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interviewer was fluent in both); all participants chose English. A $20 gift card or $20 cash was provided to participants for their time at the end of their interviews.

From a set of 64 self-identified caregivers that met inclusion criteria, 46 (71.9%) responded. Those that did not respond were unable to be reached by phone or did not go to their scheduled survey time(s). Less than five were recruited from the newspaper advertisement with the rest being recruited from the HOAAS. Only two of the respondents were males. They were not included in this study's analysis as the male experience would not be adequately represented with only two individuals, leaving a total sample of 44 participants. Complete data were available for all of the study's respondents, except for two questions. The question asking the number of children living in the home of the caregiver was missing from one respondent and the question asking how has caregiving affected your health had one participant respond "Don't know/unsure" (see Table 1). The average amount of time to complete the entire survey was 45 minutes.

Approvals

Approval from the University of Arizona Human Subjects Protection Program and the Hopi Tribal Council was obtained prior to initiation of surveying, and a letter of approval was also received from the Chairman for publishing this manuscript. All members of the research team completed CITI training as well.

Analysis

Stata 13 data analysis software was used for all analyses (Stata, 2018). Cronbach's alphas were calculated for the resilience scale and the perceived stress scale. Per the Hopi tribe's request, any counts less than five were reported as "< 5." Frequencies and percentages were calculated for categorical values. Group means (± *SD*) were calculated using the summary resilience and stress scale scores from each participant. To examine the association of resilience and stress with the caregiver and care recipient characteristics, participants were first classified as being below or above the median for resilience and being below or above the median for stress (indicators that resilience and stress were relatively lower or higher). Fisher's Exact Test was then used to compare the caregiver and care recipient characteristics with their higher/lower resilience and stress classifications. A regression analysis that adjusted for age, education, and employment status was

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performed to assess whether caregiver resilience was associated with stress. Data was calculated by number of complete responses for each question.

RESULTS

A slight majority of the caregivers were over the age of 60 (54.5%). Most (69.8%) had more than a high school education; 52.3% reported that they were currently working; 68.2% were single, widowed, separated, or divorced; 81.8% spoke English at home, and 52.3% of participants spoke Hopi at home (the question allowed more than one answer for language spoken at home). All had an adult living in the same home, and more than half (58.1%) had a family member under the age of 18 living in the same home.

Caregiver Resilience

Scores on the resilience scale (CD-RISC-10) ranged from 16-40. Cronbach's alpha (a measure of internal consistency) for the CD-RISC 10 was 0.78, which is acceptable. The mean score was 28.7 (SD = 6.2).

Resilience and Caregiver/Care Recipient Characteristics

To help examine whether the resilience of the caregivers was associated with their characteristics or the characteristics of their care recipients, the caregivers were classified as being below or above their group median resilience score (< 29 or ≥ 29), and this classification was then compared with the characteristics (Table 1). Two comparisons were statistically significant. Participants with lower resilience (scores below the median) were more likely to report that caregiving was an expectation of all Hopis. Participants with higher resilience were more likely to live together with their care recipient.

Mean resilience scores of caregivers by care recipient health condition were as follows: disability (M = 29.0, SD = 8.7; $n < 5$), cancer (M = 29.0, SD = 3.2; n = 8), and other (non-cancer) diseases (M = 28.7, SD = 3.3; n = 30); among these other diseases were Alzheimer's disease/ dementia (M = 25.9, SD = 1.2; n = 12) and diabetes (M = 29.7, SD = 2.5; n = 6).

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Table 1
Association of Caregiver Characteristics and Perceptions with Lower/Higher Resilience and Stress[a]

	Resilience			Stress		
	Lower *N* = 21	Higher *N* = 23		Lower *N* = 22	Higher *N* = 22	
	n (%)	*n* (%)	FET[b]	*n* (%)	*n* (%)	FET[b]
Adults living in home of caregiver						
1-2	11 (52.4)	9 (39.1)		10 (45.5)	10 (45.5)	
3 or more	10 (47.6)	14 (60.9)		12 (54.5)	12 (54.5)	
Children living in home of the caregiver[c]						
0	10 (47.6)	8 (36.4)		10 (47.6)	8 (36.4)	
1 or more	11 (52.4)	14 (63.6)		11 (52.4)	14 (63.6)	
Years caregiving						
<3	8 (38.1)	11 (47.8)		10 (45.5)	9 (40.9)	
3 or more	13 (61.9)	12 (52.2)		12 (54.5)	13 (59.1)	
Reasons for Caregiving						
Wanted to care for the elder						
Yes	13 (61.9)	17 (73.9)		16 (72.7)	14 (63.6)	
No	8 (38.1)	6 (26.1)		6 (27.3)	8 (36.4)	
Only family that can take care of the elder						
Yes	10 (47.6)	5 (21.7)		8 (36.4)	7 (31.8)	
No	11 (52.4)	18 (78.3)		14 (63.6)	15 (68.2)	
Elder preferred to live together instead of assisted living facility						
Yes	11 (52.4)	9 (39.1)		8 (36.4)	12 (54.5)	
No	10 (47.6)	14 (60.9)		14 (63.6)	10 (45.5)	
Hopi expected to be caregivers						
Yes	17 (81.0)	10 (43.5)	**	15 (68.2)	12 (54.5)	
No	<5	13 (56.5)		7 (31.8)	10 (45.5)	
Females expected to be caregivers						
Yes	10 (47.6)	9 (39.1)		6 (27.3)	13 (59.1)	*
No	11 (52.4)	14 (60.9)		16 (72.7)	9 (40.9)	
Not employed so have time						
Yes	8 (38.1)	7 (30.4)		5 (22.7)	10 (45.5)	
No	13 (61.9)	16 (69.6)		17 (77.3)	12 (54.5)	
Caregiving Experience						
Hours per week caregiving						
≤ 20	9 (42.9)	9 (39.1)		9 (40.9)	9 (40.9)	
21-40	<5	<5		<5	<5	
> 40 hours	8 (38.1)	12 (52.2)		10 (45.5)	10 (45.5)	
Physical strain						
High	<5	<5		<5	5 (22.7)	
Moderate	10 (47.6)	12 (52.2)		11 (50.0)	11 (50.0)	
Low	7 (33.3)	8 (36.4)		9 (40.9)	6 (27.3)	
Number of difficulties						
<2	7 (33.3)	6 (26.1)		10 (45.5)	<5	*
3 or more	14 (66.7)	17 (73.9)		12 (54.5)	19 (86.4)	
Caregiver/Care recipient living situation						
Living apart	11 (52.4)	4 (17.4)	*	9 (40.9)	6 (27.3)	
Living together	10 (47.6)	19 (82.6)		13 (59.1)	16 (72.7)	

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Table 1 Continued
Association of Caregiver Characteristics and Perceptions with Lower/Higher Resilience and Stress[a]

	Resilience			Stress		
	Lower *N* = 21	Higher *N* = 23		Lower *N* = 22	Higher *N* = 22	
	n (%)	*n* (%)	FET[b]	*n* (%)	*n* (%)	FET[b]
Caregiver Personal Health						
Caregiver's health						
Excellent or Very good	7 (33.3)	11 (47.8)		13 (59.1)	5 (22.7)	*
Fair or Poor	14 (66.7)	12 (52.2)		9 (40.9)	17 (77.3)	
Has caregiving affected your health[d]						
No impact	13 (61.9)	14 (63.6)		15 (68.2)	12 (57.1)	
Made it better	<5	<5		<5	<5	
Made it worse	8 (38.1)	5 (22.7)		5 (22.7)	8 (38.1)	
Have exercise habits changed since becoming a caregiver						
No change	6 (28.6)	11 (47.8)		10 (45.5)	7 (31.8)	
Exercise more	<5	<5		<5	<5	
Exercise less	12 (57.1)	9 (39.1)		9 (40.9)	12 (54.5)	
Days of exercise per week						
0-2 days	8 (38.1)	7 (30.4)		9 (40.9)	6 (27.3)	
3-4 days	5 (23.8)	12 (52.2)		9 (40.9)	8 (36.4)	
5-7 days	8 (38.1)	<5		<5	8 (36.4)	
Social Support						
Informal-Family over 18 years of age						
Yes	15 (71.4)	18 (78.3)		16 (72.7)	17 (77.3)	
No	6 (28.6)	5 (21.7)		6 (27.3)	5 (22.7)	
Informal-Family under 18 years of age						
Yes	6 (28.6)	11 (47.8)		6 (27.3)	11 (50.0)	
No	15 (71.4)	12 (52.2)		16 (72.7)	11 (50.0)	
Formal caregiving assistance						
Yes	10 (47.6)	7 (30.4)		6 (27.3)	11 (50.0)	
No	11 (52.4)	16 (69.6)		16 (72.7)	11 (50.0)	
Aspects of Culture						
Caregiver use of traditional healer or medicine person in past 5 years						
0	10 (47.6)	10 (43.5)		14 (63.6)	6 (27.3)	*
1+ times	11 (52.4)	13 (56.5)		8 (36.4)	16 (72.7)	
Caregiver takes part in cultural ceremonies						
Yes	16 (76.2)	21 (91.3)		18 (81.8)	19 (86.4)	
No	5 (23.8)	<5		<5	<5	
Care recipient goes to a traditional healer or medicine person						
Yes	11 (52.4)	11 (47.8)		10 (45.5)	12 (54.5)	
No	10 (47.6)	12 (52.2)		12 (54.5)	10 (45.5)	

Note. Percentages may not total to 100% due to rounding error, or to responses <5 that were not included in the percentage calculations.
[a]Higher and lower defined as being above or below the median resilience or stress score for the sample.
[b]FET = Fisher's Exact Test.
[c]One participant did not respond to this question.
[d]One participant "did not know/was unsure" for this question.
*p<0.05
**p<0.01

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Caregiver Stress

Scores on the stress scale (PSS-10) ranged from 4-28. Cronbach's alpha for the PSS-10 was 0.75 (acceptable). The mean score on this scale was 17.9 (*SD* = 6.2).

Stress and Caregiver/Care Recipient Characteristics

To help examine whether the stress of the caregivers was associated with their characteristics or the characteristics of their care recipients, caregivers were classified as being above or below their group median stress score (< 19.5 or ≥ 19.5), and this classification was then compared with the characteristics (Table 1). Some significant associations were indicated. In particular, caregivers who reported relatively higher stress (above the median) also reported a higher total number of caregiver difficulties, a poorer self-perception of their own health, use of a traditional healer in the past 5 years, and that females were expected to be caregivers.

Mean stress scores by care recipient health condition were as follows: disability (*M* = 18.8, *SD* = 5.1; *n* < 5), cancer (*M* = 20.0, *SD* = 1.8; *n* = 8), and diseases other than cancer (*M* = 17.0, *SD* = 1.1; *n* = 30); among these other diseases were diabetes (*M* = 18.0, *SD* = 1.7, *n* = 6) and Alzheimer's/dementia (*M* = 18.8, *SD* = 1.5, *n* = 12).

Table 2
Association of Stress with Resilience, Age, Education and Employment Status

	Unadjusted	Adjusted
	b (CI)	*b* (CI)
Resilience score	-0.41 (-0.69, -0.12)**	-0.41 (-0.70, -0.12)**
Demographics		
Age	-0.06 (-0.22, 0.09)	-0.08 (-0.25, 0.10)
Education[a]	0.60 (-3.61, 4.80)	1.02 (-3.40, 5.44)
Employment[b]	0.48 (-3.36, 4.32)	-0.21 (-4.67, 4.26)

b = unstandardized regression coefficient. CI = 95% confidence interval.
[a]Education coding: 0 = high school graduate or less; 1 = education beyond a high school education.
[b]Employment coding: 0 = student, retired, disabled or not currently working; 1 = working full-time or part time or self-employed.
*p<0.05
**p<0.01

Association of Resilience with Stress

A regression analysis that adjusted for the participants' age, education, and employment status was performed to examine whether resilience was associated with stress. A statistically significant association was found (Table 2). The adjusted regression coefficient for resilience

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indicated that every 1-unit increase in the resilience score was associated with a decrease in the stress score of 0.41 ($p < 0.01$). Age, education, and employment status were not found to be significantly associated with stress.

DISCUSSION

Although resilience and stress are known to be important factors in the caregiving experience of the general population (Jervis et al., 2010; Ong et al., 2006), this study, to our knowledge, is the first to examine resilience and stress among AI caregivers. Forty-four female caregivers on the Hopi reservation were surveyed regarding resilience and stress. The mean resilience score found for these caregivers was 28.7 (*SD* = 6.2), somewhat lower than that reported for females in a large general community-based survey that administered the CD-RISC-10 (*M* = 31.1, *SD* = 5.6; Campbell-Sills et al., 2009). The mean PSS-10 stress score found for the Hopi caregivers (*M* = 17.9, *SD* = 6.2) was slightly higher than that reported for females in a national survey that administered the PSS-10 (*M* = 16.1, *SD* = 7.5; Cohen & Janicki-Deverts, 2012).

Caregiver resilience was found to be associated with some of the measured caregiver characteristics. In particular, caregivers who reported that they lived with their care recipient had significantly higher resilience scores. A possible explanation is that caregivers who live in the same home as their care recipients experience higher resilience partly in association with family connectedness (Coser et al., 2018). The AI family unit itself has been found to be associated with resilience in several non-caregiver AI studies (Teufel-Shone et al., 2018). Many AI families have more than one generation in the same household. In comparison to other racial/ethnic groups in Arizona, AIs have the highest percentage of multigeneration (three or more generations) households and is an aspect of AI culture (Lofquist, 2012). In contrast, caregivers who felt that caregiving was a cultural expectation of all Hopis had lower resilience scores. This suggests that caregivers with lower resilience may perceive less choice as to the performance of their caregiver role. If one considers that resilience entails "[Q]ualities that enable one to thrive in spite of stressful events" (Schure et al., 2013 p.27), choice might be one of these qualities. In general, resilience scores of the Hopi caregivers differed little by whether the care recipient's health condition involved disability, cancer, other (non-cancer) diseases, or diabetes. The care recipient condition associated with the largest difference from the general mean resilience score of 28.7 was that found for caregivers providing care to persons with Alzheimer's/dementia (*M* = 25.9).

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Caregiver characteristics were found to be associated with caregiver stress as well. Caregivers who felt that caregiving was an expectation of females instead of males reported higher stress. Again, this might be an issue of choice. Longacre et al. (2014) found that, among those providing cancer care to family members (general population study), a perceived lack of choice in providing care was significantly associated with greater stress (also see National Alliance for Caregiving, 2015). In the present study, caregivers who reported a greater number of difficulties reported significantly higher stress as well as caregivers who reported only poor/fair health. Consistent with this, Luchesi et al. (2016) found that higher stress was associated with poorer health in a study of Brazilian caregivers aged 60+ years. Finally, Hopi caregivers that used a traditional healer at least once in the past five years reported higher stress. It might be that caregivers with higher stress sought out a traditional healer to help deal with what may be contributing to their stress, such as poorer health. In general, stress scores of the Hopi caregivers differed little by whether the care recipient's health condition involved disability, diabetes, or Alzheimer's/dementia. The care recipient condition associated with the largest difference from the general mean stress score of 17.9 was that found for caregivers providing care to persons with cancer (M = 20.0).

Finally, our study's regression analysis indicated that higher Hopi caregiver resilience scores were associated with lower stress. This finding is consistent with studies that have found higher resilience to be associated with lesser stress in several other populations (Bacchi & Licinio, 2017; Kermott et al., 2019; Lim et al., 2014; Tian et al., 2016).

Implications

Given the inverse association between resilience and stress found here among female Hopi caregivers, programs working with AI caregivers may wish to explore whether supporting the resilience of caregivers is a means towards limiting their stress. Although there is limited published research on AI resilience, some programs currently exist with the goal of promoting resilience among AIs. For example, the Center for American Indian Resilience partners with AI communities in an effort to support resilience-building education, programs, and activities (Northern Arizona University, n.d.). Programs, however, that support resilience and its correlates (e.g., lesser stress) among AIs have not typically focused on caregivers. This study's findings will hopefully help bring more attention to AI caregivers and thus more research and programs designed to support them and the important work that they do, both on the Hopi reservation and among other tribes in the United States.

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Limitations

This study examined data from a convenience sample of female Hopi caregivers. Generalizability of the findings to male AI caregivers, other tribes, and urban AI populations is unknown. Due to the small sample size (N = 44), the study may have lacked statistical power to identify some associations. The ability to compare and contrast this study's findings with other work on resilience and stress among AI caregivers was limited due to a general absence of research on the topic.

CONCLUSION

This is the first study to look at the relationship between resilience and stress in AI caregivers. It found that higher resilience was associated with lesser stress among Hopi female caregivers. In light of this finding, programs working with AI caregivers may wish to explore whether supporting the resilience of these caregivers is an avenue towards limiting their stress.

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