THE JOURNAL OF RURAL HEALTH

Original Article

Risk and Protective Factors Associated with Moderate and Acute Suicidal Ideation among a National Sample of Tribal College and University Students 2015-2016

Myra Parker, JD, MPH, PhD;[1] Bonnie Duran, DrPH;[2] Isaac Rhew, PhD;[1] Maya Magarati, PhD;[2] Mary Larimer, PhD;[1] & Dennis Donovan, PhD[3]

1 Center for the Study of Health and Risk Behaviors, Department of Psychiatry and Behavioral Sciences, School of Medicine, University of Washington, Seattle, Washington
2 School of Social Work, Indigenous Wellness Research InstituteUniversity of Washington, Seattle, Washington
3 Alcohol and Drug Abuse Institute, Department of Psychiatry and Behavioral Sciences, School of Medicine, University of Washington, Seattle, Washington

Disclosures: All authors attest that they do not have any financial or nonfinancial conflicts of interest regarding the funded research or publications resulting from the research.

Funding: Funding for this project was from a grant by the National Institute on Minority Health and Health Disparities, Award Number 5P60MD006909.

Acknowledgments: The authors wish to acknowledge our Tribal Colleges and Universities community partners, whose collaboration and participation were instrumental in planning and implementing the study, as well as contextualizing the data for this paper. In alphabetical order, our partners for the TCU Student Epidemiology Survey Study are: The American Indian Higher Education Consortium (Washington, DC), Bay Mills Community College (Brimley, MI), Blackfeet Community College (Browning, MT), Diné College (Tsaile, AZ), Fond du Lac Tribal & Community College (Cloquet, MN), Fort Peck Community College (Poplar, MT), Ilisagvik College (Utqiagvik, AK), Institute of American Indian Arts (Santa Fe, NM), Keweenaw Bay Ojibwa Community College (Baraga, MI), Lac Courte Oreilles Ojibwa Community College (Hayward, WI), Little Priest Tribal College (Winnebago, NE), Navajo Technical University (Crownpoint, NM), Nebraska Indian Community College (Macy, NE), Northwest Indian College (Bellingham, WA), Oglala Lakota College (Kyle, SD), Red Crow Community College (Cardston, Alberta, Canada), Saginaw Chippewa Tribal College (Mt. Pleasant, MI), Salish Kootenai College (Pablo, MT), Sitting Bull College (Fort Yates, ND), Southwestern Indian Polytechnic Institute (Albuquerque, NM), Stone Child College (Box Elder, MT), United Tribes Technical College (Bismarck, ND), and Turtle Mountain Community College (Belcourt, ND).

For further information, contact: Myra Parker, JD, MPH, PhD, Center for the Study of Health and Risk Behaviors, Department of Psychiatry and Behavioral Sciences, School of Medicine, University of Washington, 1100 NE 45th Street, Suite 300, Seattle, WA 98105; e-mail: myrap@uw.edu.

doi: 10.1111/jrh.12510

Abstract

Objectives: We examined the relationship between suicide risk and disability status, as well as risk and protective factors, adjusting for demographic characteristics, among students attending 22 Tribal Colleges and Universities (TCU; 20 rural and 2 urban) across the United States in fall 2015 and 2016.

Methods: Tribal college students (N = 3,239) participated in a cross-sectional online or paper survey assessing alcohol use patterns and mental health outcomes, yielding a response rate of 31.3%.

Results: Of the students surveyed, 8.8% indicated moderate or high suicide risk. Hearing impairment was significantly associated with moderate/high suicide risk (OR = 2.11; 1.24-3.61, $P = .006$), as was vision impairment (OR = 3.03; 1.92-4.77, $P < .001$), having a physical/mental/or emotional condition (OR = 2.12; 1.75-2.57, $P < .001$), experiencing critical appraisal (OR = 1.30; 1.24-1.36, $P < .001$), and experiencing critical isolation (OR = 1.83; 1.66-2.01, $P < .001$). Scoring high on resilience (OR = 0.93; 0.92-0.95, $P < .001$), reporting higher emotional social support (OR = 0.75; 0.70-0.79, $P < .001$), and reporting higher levels of instrumental social support (OR = 0.69, 0.62-0.76, $P < .001$) were significantly associated with lower suicide risk.

Conclusions: Students attending tribal colleges who experience hearing impairment, sight impairment, or a physical/emotional/mental condition have a greater risk of suicidality. Students experiencing critical appraisal and critical isolation may benefit from behavioral health interventions to reframe these experiences and develop resiliency skills. Developing avenues of emotional and instrumental social support within TCU settings offers key protective factors to buffer the risk of suicidality. Examining additional ways to build resiliency may also offer protection from suicide risk in this population.

Key words American Indians and Alaska Natives, disability status, resilience, social support, suicide risk.

Suicide and suicide risk remain critical public health issues in American Indian and Alaska Native (AI/AN) communities. Age-adjusted suicide death rates are consistently higher for AI/AN; in Alaska, the death rate is 42.7, compared to 7.6 among Whites, per 100,000 population (RR = 5.65; 95% CI: 4.56-7.03) and 21.3, compared to 5.3 among Whites, per 100,000 population in the Northern Plains region (RR = 4.02; 95% CI: 3.54-4.54).[1] AI/AN males have the highest suicide death rates, at 34.7 per 100,000 population overall, as compared to 23.2 for White men. Older AI/AN and those with higher household incomes are at lower risk of suicide behaviors,[2] with over a third (35.7%) of AI/AN who died as a result of suicide falling within the 10- to 24-year-old age group in 2017, compared to 11% of White deaths due to suicide.[3] More information on risk and protective factors is needed to address the problem. In particular, little is known regarding suicide risk among Tribal College and University (TCU) students with disabilities, which may represent a key stressor for TCU students experiencing limited services and low levels of social support, and how resiliency and high levels of social support might affect suicide risk among TCU students.

While TCUs offer rich cultural content and connection, they operate in geographically isolated regions of the United States,[4] with limited access to specialty care,[5] and within communities faced with some of the highest levels of poverty and unemployment in the nation.[6] Understanding whether these factors are related to suicide risk can assist TCU staff and faculty in developing programs and other supports to best meet TCU student needs, and serve as a basis for community efforts to identify and secure additional resources to ensure the sustainability of these essential supports. Though the literature is well developed in describing the association between social isolation and suicide behavior (eg, research has confirmed associations between loneliness, social withdrawal, living alone, having few social supports, living in disrupted families, and losing a spouse with a higher risk for lethal suicidal behavior),[7] few studies have examined this association in AI/AN populations. A national study of 3,157 older male veterans found that higher levels of emotional and instrumental support predicted a decrease in the odds of experiencing suicidal ideation.[8] One study of 31,625 indigenous Canadians found a significant association between social support and self-reported well-being.[9] Oetzel and colleagues examined social support and social undermining and the associations with alcohol use, drug use, and mental health outcomes among AI/AN women within an Indian Health Service population. Two subscales of social support, emotional and instrumental support, were associated with any substance abuse. Social undermining (including both isolation and critical appraisal subscales) was associated with any substance abuse; any mood disorder was associated with critical appraisal and 2 or more disorders; and any anxiety and any disorder were associated with isolation.[10] Suicide risk was not included in these analyses.

Few studies examine the role of resiliency in suicide risk. In a matched case-control study of non-AI/AN prisoners who had and had not attempted suicide, those who had attempted had significantly higher Connor-Davidson Resiliency scale (CD-RISC) scores.[11] Fanning and Pietrzak found that veterans reporting suicidal ideation also reported significantly lower CD-RISC scores than those who had not reported suicidal ideation; however, resiliency was not included in the multivariate analyses.[8] One cross-sectional study of 690 AI/AN 6th-12th graders in New Mexico examined risk and resiliency factors for students indicating they had attempted suicide one or more times (24.2%).[12] Resiliency factors related to a lower risk of suicide included having neighbors who cared about them, adults who made them feel important, and having friends who did well in school. Among the risk factors examined, feeling depressed, using drugs and alcohol, and having been the victim of violence were related to having attempted suicide.

The research literature remains limited in the examination of disability status among AI/AN, as well as among the broader US population,[13] and specifically within TCU settings. We hypothesized that disability status could be a potential stressor for TCU students if supports are not available. Our TCU partners confirmed the need to explore disability status among TCU students. In developing the survey items, we found limited information in the literature to use as a basis for the present study, in part because disability status includes many types of conditions, with complex issues associated with each. One study of TCU student perceptions of disability accommodation based at Salish Kootenai College in Pablo, Montana, found students agreed some accommodations should be made to support students with learning disabilities, though they were unsure whether these accommodations would serve to lower overall academic standards. This study found that TCU students believed students with learning disabilities should be provided tutorial support and academic counseling and demonstrated a limited awareness of whether accommodations were requested.[14] In a qualitative study in one tribal college setting, researchers found TCU faculty and staff had difficulty defining disability, and, while they believed classroom accommodations were available for students with disabilities, were unable to provide specific descriptions of the types of support services provided.[15] In one quantitative study examining the association between health outcomes and self-reported grades, the authors found that female American Indian college students

experience a statistically significant greater negative impact from poor health outcomes and physical disability on lower self-reported grades as compared to males.[16] However, suicide risk was not specified and disability was limited to physical issues.[16] These studies point to the need to define disability status more clearly within tribal college settings to improve services that support students' specific needs. At the same time, disability status is nuanced and complex,[13] and therefore reducing student's disability status to a limited number of self-reported survey questions fails to comprehensively capture the reality of living with disabilities. To address this issue, we used the 2014 American Community Survey disability status questions to establish the definition of disability for the present study. This definition includes examples of activities of daily living and was widely used to assess the degree to which individuals need assistance with certain daily tasks in this national survey. While it does not provide a detailed, comprehensive examination of student disability status, it served as a means of measuring disability status broadly, in order to examine overall TCU student needs upon which future research may be based.

This paper focuses on an examination of the risk and protective factors among TCU students associated with suicide risk. We also examine suicide risk among a subgroup of TCU students who identified as having a vision or hearing impairment, and/or an emotional, behavioral, or mental impairment. We collected data through the Tribal Colleges and Universities Creating Campus Change study, conducted among AI/AN and White/other students in 22 tribal colleges and universities across the United States. Relying on the Indigenous Stress Coping Model,[17] we hypothesized that risk factors (stressors) would include the negative subscales of social support, isolation and social support, and that protective factors would include resiliency, and the positive subscales of social support, including emotional and instrumental support. We also hypothesized that disability status could present an additional stressor for TCU students, and we chose to examine the suicide risk specific to this subgroup in order to better understand how to best support these students. These hypotheses align with the precepts of the Indigenous Stress Coping Model, which offers a framework for understanding the associations between stressors and coping strategies, including Indigenous-specific strategies, which may attenuate or reduce the risk of poor health outcomes, such as suicide behaviors.

Methods

Participants and Setting

The research team collected primary data for this study, which included a sample of 3,239 tribal college students from 22 participating tribal colleges and universities. Of the 22 participating colleges, half are located in rural settings, as defined by the US Census, having a population of 2,500 or less in 2016. TCU student participants completed an online/paper assessment. The primary outcomes of interest in this national cross-sectional study included alcohol use and mental health outcomes. Due to a higher than average proportion of students reporting moderate to high levels of suicide behaviors, the Principal Investigator submitted and received an administrative supplement to conduct additional subgroup analyses to examine risk and protective factors associated with suicide behaviors among TCU students. Participants were recruited through a variety of methods, including online social networking sites, flyers, and local tribal college registrar's lists. Adults ages 18 years and older contributed data from March 2015 through May 2016. The final sample included a minimum of 2,970 participants with full data, depending on the measures included in the analysis. The research team followed approved protocols to ensure project compliance with the university Institutional Review Board, Tribal and TCU Research Review Boards, and Family Educational Rights and Privacy Act guidelines.

Approach

This study was conducted using Community-Based Participatory Research (CBPR).[18] The CBPR framework includes a set of 9 principles that guide how community members and researchers collaborate to implement research steps, collect and analyze data, and disseminate the results. Community participation was sought and provided at every level of research prior to and throughout the duration of the study, ensuring meaningful participation by TCU staff, faculty, and students in all aspects of the research, from developing the grant application, establishing the research aims, developing the survey items, and assisting with data collection and recruitment of participants.

Upon completion of the research, the data presented in this study were shared with TCU students, staff, and faculty at a convening meeting held by the principal investigator. Interested community members reviewed the abstract, the data tables, and the summary of results, providing input regarding the interpretation, relevance, and TCU context. Their input informed the development of the present article. An initial draft of this article was shared with TCU community members for additional review. Upon confirmation of the article, this paper was then circulated to TCU Presidents through the American Indian Higher Education Consortium Research Committee. The research committee comments were integrated, and the paper was then reviewed and approved for

publication by participating communities' research review boards and institutional review boards.

The underlying research instrument, the TCU Student Epidemiology Survey, may be requested from the principal investigator. Access to the aggregated, deidentified data will require approval from the principal investigator, the American Indian Higher Education Consortium, and the 22 Tribal Colleges and Universities that formulated and participated in the survey.

Measures

The outcome of interest was suicide risk, assessed with the suicidality module of the Mini International Neuropsychiatric Interview (MINI).[19–21] Currently, no standard online suicide-screening instrument exists as a gold standard for AI/AN populations. The MINI is a short, diagnostic structured interview developed jointly by psychiatrists and clinicians in the United States and Europe for DSM-IV and ICD 10. The responses included 3 skip patterns. If participants indicated "Yes" to the question, "In the past month did you suffer any accident," (all students received this question) they were given 2 subsequent follow-up questions, asking students whether they intended to hurt themselves and whether they intended to die. These follow-up items were used to assess suicide attempts and ideation, to include in the final score, as well as provide clinicians with specific information on the level of risk for follow-up under the study data safety and monitoring plan. All students then received the remaining MINI suicidality assessment including questions, such as, "In the past month did you think that you would be better off dead or wish you were dead," and, "In the past month did you attempt suicide?" One item asked students to respond "Yes" or "No" to whether they thought about suicide in the past month. If students answered "Yes," they received 3 follow-up items asking them how often they had these thoughts, how intense the thoughts were, and whether they felt they could control these thoughts. An additional survey logic pattern was introduced when students were asked if they attempted suicide in the past month. If students indicated they had, they were asked if they hoped to be rescued and whether they expected or intended to die. All students received the final item, asking them whether they had ever made a suicide attempt in their lifetime. In clinical practice, item scores are typically summed to yield a total risk score and are categorized as no (0), low (1-5), moderate (6-9), or high (10+) suicide risk. For analyses, we created a dichotomous variable to indicate elevated suicide behaviors based on a score of 6 or higher ("moderate to high levels of suicide behaviors" = 1) versus a score of 5 or lower ("low to no suicide behaviors" = 0). Roaldset et al completed a validity study of the MINI, which served as a basis for our selection of the moderate- to high-risk categories for analysis.[22]

Covariates

The 10-item Connor-Davidson Resilience scale (CD-RISC) was used to assess resiliency.[23] This 10-item scale includes 5-point Likert responses ranging from "Not true at all," scored as "0" to "True nearly all the time," scored as "4." Items include: (1) I am able to adapt when changes occur; (2) I can deal with whatever comes my way; (3) I try to see the humorous side of things when I am faced with problems; (4) Having to cope with stress can make me stronger; (5) I tend to bounce back after illness, injury, or other hardships; (6) I believe I can achieve my goals, even if there are obstacles; (7) Under pressure, I stay focused and think clearly; (8) I am not easily discouraged by failure; (9) I think of myself as a strong person when dealing with life's challenges and difficulties; and (10) I am able to handle unpleasant or painful feelings like sadness, fear, and anger.

Three items from the 2014 American Community Survey were used to assess self-reported impairment with respect to hearing, vision, or emotional/behavioral/mental impairment.[24] In particular, we asked students to report "yes" or "no" as to whether they were deaf or had serious problems hearing; whether they were blind or had serious difficulty seeing even when wearing glasses; and whether, because of a physical, mental, or emotional condition, they had serious difficulty concentrating, remembering, or making decisions, had serious difficulty walking or climbing the stairs, difficulty dressing or bathing, or difficulty doing errands, such as visiting a doctor's office or shopping.

Social support was assessed using the Social Support and Social Undermining scale (SSSU).[10] The SSSU scale includes 20 items, and responses vary from binary "yes," "no" responses to 3-item Likert responses, such as "Never," "Often," "Sometimes" and "Not very isolated at all," "Somewhat isolated," "Very isolated." Items include questions, such as "How much do your friends or relatives understand the way you feel about things?" and "How much can you talk to your friends or relatives about your worries?" For analyses, the 4 subscales were used separately to examine the effects of emotional support, instrumental support, critical appraisal (neg.), and critical isolation (neg.).

Demographic characteristics, including biological sex, race, age, and income, were also assessed.

Analyses

We examined bivariate associations between suicide risk by birth sex, income, gender, and age. Second, we

ran multivariable logistic regression models to estimate odds ratios (ORs) for the associations between suicide behaviors and disability status, and risk and protective factors. Suicide risk was categorized as "No or low levels of suicide behaviors" (0) or "Moderate to High levels of suicide behaviors" (1). Covariates for sex, indicators for race/ethnicity (American Indian/Alaska Native alone, American Indian/Alaska Native in combination with another race, or White/other), and age were included in all models. In separate models, we examined whether changes in outcomes varied according to resiliency score, impairment due to hearing, vision, or mental/emotional/physical limitations, or social support (by subscale). Due to potential differential nonresponse according to participant characteristics, raking weights were calculated according to age, sex, and Native self-identification. We applied these inverse sampling weights as well as accounted for the 22-school stratum to all analyses, including descriptive statistics and regression models using Stata 14.0.[25]

Results

Demographic and Mental Health Characteristics

A total of 3,212 tribal college students aged 18 or older completed the survey. The mean age of the sample was 29.7 years (SD = 11.0, range 18-84). The majority were women (67.6%), identified as AI/AN (73.6%), and reported an annual household income of less than $25,000 (56.7%). Almost 9% (8.8%) of students indicated moderate or high suicide risk, as defined by the MINI. Of the students responding to suicide behavior items (N = 3,115), 72 students indicated they had an accident in the past month (the first item on the MINI), and received the 2 follow-up items to assess whether this may have been related to suicidal behaviors. All students received the fourth through tenth item of the MINI, to assess other suicidal behaviors, as well as the last MINI item asking students if they had made a suicide attempt in their lifetime. In response to the item asking students if they thought about suicide in the past month, 254 students confirmed they had these thoughts, and received the 2 MINI follow-up items. Table 1 provides distribution of demographic, clinical, and protective variables.

Table 1 Demographic and Mental Health Characteristics of Tribal Colleges and Universities Student Participants (N = 3,212)

		Percentage/μ (SD)
Birth Sex		
	Male	32.4
	Women	67.6
Race		
	AIAN	73.6
	AIAN Multiracial	13.4
	White/Other	11.1
Household income		
	<$5,000	20.9
	$5,000-14,999	20.6
	$15,000-24,999	15.2
	$25,000-49,999	23.1
	$50,000-74,999	11.9
	$75,000+	8.3
Age		
	18-20	20.5
	21-23	20.1
	24-29	22.6
	30-39	18.7
	40-49	10.4
	50+	7.7
Hearing impairment		
	Yes	4.5
	No	95.5
Vision impairment		
	Yes	5.2
	No	94.8
Mental, physical, or emotional condition		
	Yes	13.9
	No	86.1
Connor-Davidson Resilience		30.4 (7.7)
Social support		
	Emotional	15.6 (2.7)
	Instrumental	4.3 (1.3)
	Critical Appraisal[a]	10.8 (3.0)
	Critical Isolation[a]	4.7 (1.6)

[a] Higher scores for these subscales are representative of lower social support.

Examining Unadjusted Associations between Suicide Behaviors and Risk and Protective Factors

We used unadjusted models (Table 2) to assess our hypothesized associations based on our conceptual model, that disability status may confer additional stress, which may be related to suicide behaviors. We found that in the unadjusted logit models, hearing impairment was significantly associated with higher odds of moderate/high levels of suicide behaviors (OR = 2.11; 1.24-3.61, P = .006), as was sight impairment (OR = 3.03; 1.92-4.77, P < .001) and reporting having a physical/mental/or emotional condition (OR = 1.88; 1.59-2.24, P < .001). We also explored the association between demographic characteristics and suicide behavior. Reporting AI/AN race in combination with another race was also significantly associated with higher odds of moderate/high levels of suicide behaviors (OR = 1.81; 1.26-2.62, P = .001), while

Table 2 Unadjusted Odds Ratios Predicting Suicide Risk from Demographic Characteristics

Factor	Unadjusted OR (95% CI)	*P* value
Birth sex	1.16 (0.80-1.66)	.433
Race		
American Indian	0	
American Indian + Other Racial Background	1.81 (1.26-2.62)	.001
White	1.30 (0.73-2.32)	.371
Income	0.89 (0.80-0.98)	.023
Age	0.84 (0.74-0.95)	.005
18-20	0	
21-23	.56 (.34-.98)	.040
24-29	.62 (.39-.98)	.042
30-39	.60 (.37-.96)	.034
40-49	.37 (.20-.69)	.002
50+	.43 (.19-.98)	.044
Hearing impairment	2.11 (1.24-3.61)	.006
Sight impairment	3.03 (1.92-4.78)	<.001
Physical, mental, or emotional condition	1.88 (1.59-2.24)	<.001

having a higher income (OR = 0.89; 0.80-0.98, $P = .023$) and being older in age (OR = 0.84; 0.74-0.95, $P = .005$) were both associated with lower odds of moderate/high suicide behaviors for TCU students.

Examining the Adjusted Association between Suicide Behaviors and Disability Status

To further explore our hypothesis, and assess whether disability status may be related to significantly higher odds of reporting moderate to high levels of suicide behaviors over and above the effect of income, age, birth sex, and race, we included these demographic variables in the multivariate logit models. As shown in Table 3, self-reported hearing impairment was significantly associated with higher odds of reporting moderate/high levels of suicide behaviors (OR = 2.11; 1.24-3.61, $P = .006$), as was self-reported sight impairment (OR = 3.03; 1.92-4.77, $P < .001$) and reporting having a physical/mental/or emotional condition (OR = 2.12; 1.75-2.57, $P < .001$), after adjustment for covariates.

Examining the Adjusted Association between Suicide Behaviors and Poor Social Support

We then used similar logit models to examine associations between 2 negative subscales from the social support measure and the odds of reporting suicide behaviors, adjusting for covariates. As shown in Table 4, experiencing critical appraisal was significantly associated with higher odds of reporting moderate/high levels of suicide behaviors (OR = 1.30; 1.24-1.36, $P < .001$), as was experiencing critical isolation (OR = 1.83; 1.66-2.01, $P < .001$).

Examining the Adjusted Association between Suicide Behaviors and High Social Support and Resilience

Finally, we examined whether resiliency, emotional support, and instrumental social support were related to lower odds of reporting suicide behaviors, over and above demographic characteristics. We estimated multivariate logistic regressions to examine the associations between the level of suicide behaviors, birth sex, race, income, and age, with the 3 protective factors: resiliency score, emotional social support, and instrumental social support. Table 5 provides the adjusted models that include protective factors of resilience, emotional support, and instrumental

Table 3 Adjusted Odds Ratios for Suicide Risk Associated with Demographic Characteristics

Factor	Adjusted OR (95% CI)	*P* value	Adjusted OR (95% CI)	*P* value	Adjusted OR (95% CI)	*P* value	Adjusted OR (95% CI)	*P* value
Birth sex	1.17 (0.80-1.70)	.409	1.19 (0.80-1.77)	.383	1.04 (0.70-1.55)	.832	0.91 (0.58-1.42)	.679
Race								
AIAN alone	ref[a]		ref[a]		ref[a]		ref[a]	
AIAN + Other	2.03 (1.36-3.01)	<.001	2.09 (1.40-3.13)	<.001	1.81 (1.19-2.76)	.006	1.82 (1.19-2.80)	.006
White	1.77 (0.94-3.34)	.076	1.80 (0.93-3.48)	.084	1.79 (0.95-3.35)	.070	1.90 (0.97-3.71)	.061
Income	0.86 (0.76-0.96)	.009	0.89 (0.79-1.00)	.060	0.89 (0.79-1.00)	.054	0.83 (0.73-0.94)	.004
Age	0.84 (0.74-0.95)	.005	0.77 (0.67-0.87)	.000	0.77 (0.68-0.88)	<.001	0.74 (0.64-0.86)	<.001
Hearing impairment	2.85 (1.67-4.87)	<.001						
Vision impairment			3.03 (1.92-4.78)	<.001				
Physical, mental, or emotional condition					1.88 (1.59-2.24)	<.001		
Number of impairments							2.12 (1.75-2.57)	<.001

[a] Please note that American Indian and Alaska Native alone was used as the comparison group.

Table 4 Adjusted Odds Ratios for Suicide Risk Associated with Certain Risk Factors

Factor	Adjusted OR (95% CI)	*P* value	Adjusted OR (95% CI)	*P* value	Adjusted OR (95% CI)	*P* value
Birth sex	1.37 (0.85-2.22)	.198	1.17 (0.78-1.76)	.449	1.21 (0.81-1.79)	.350
Race						
AIAN alone	ref[a]		ref[a]		ref[a]	
AIAN + Other	1.94 (1.20-3.12)	<.001	2.38 (1.57-3.60)	<.001	1.73 (1.13-2.65)	.012
White	1.55 (0.73-3.32)	.252	2.26 (1.17-4.36)	.015	1.59 (0.81-3.12)	.178
Income	0.84 (0.72-0.96)	.010	0.89 (0.79-1.02)	.087	0.93 (0.82-1.05)	.260
Age	0.84 (0.71-0.99)	.034	0.82 (0.72-0.94)	<.001	0.81 (0.71-0.93)	.002
Critical appraisal			1.30 (1.24-1.36)	<.001		
Critical isolation					1.83 (1.66-2.01)	<.001

[a] Please note that American Indian and Alaska Native alone was used as the comparison group.

Table 5 Adjusted Odds Ratios of Suicide Risk Associated with Protective Factors

Factor	Adjusted OR (95% CI)	*P* value	Adjusted OR (95% CI)	*P* value	Adjusted OR (95% CI)	*P* value
Birth sex	1.10 (0.74-1.63)	.639	1.25 (0.87-1.80)	.221	1.30 (0.91-1.85)	.151
Race						
AIAN alone	ref[a]		ref[a]		ref[a]	
AIAN + Other	2.11 (1.41-3.17)	<.001	2.11 (1.41-3.17)	<.001	2.09 (1.43-3.05)	<.001
White	1.87 (0.96-3.63)	.065	2.43 (1.30-4.52)	.005	2.15 (1.14-4.05)	.017
Income	0.91 (0.80-1.03)	.124	0.92 (0.81-1.03)	.159	0.89 (0.79-1.00)	.054
Age	0.90 (0.79-1.01)	.080	0.77 (0.67-0.88)	<.001	0.82 (0.72-0.93)	.002
Resilience score	0.93 (0.92-0.95)	<.001				
Emotional social support			0.75 (0.70-0.79)	<.001		
Instrumental social support					0.69 (0.62-0.77)	<.001

[a] Please note that American Indian and Alaska Native alone was used as the comparison group.

support. Higher scores of resilience (OR = 0.93; 0.92-0.95, $P < .001$), reporting higher emotional social support (OR = 0.75; 0.70-0.79, $P < .001$), and reporting higher levels of instrumental social support (OR = 0.69, 0.62-0.76, $P < .001$) were significantly associated with lower odds of reporting moderate/high level of suicide behaviors.

Discussion

Results of this study suggest that, among the 3,212 students participating, the 13.9% of tribal college students reporting a physical, emotional, or behavioral disability; 4.5% reporting a hearing impairment; and 5.2% reporting vision impairment may also be more likely to experience higher odds of reporting moderate/high levels of suicide behaviors. Prevalence of suicide risk among TCU students reporting a disability or impairment has not been previously assessed, nor have studies been conducted to estimate the proportion of students experiencing a disability or impairment. Previous research has suggested that AI/AN communities prefer to avoid stigmatization of community members reporting disability status.[26] While this approach may result in less stigma, it may also have other effects, including a disconnect between student support and other factors that may support students with these unique needs.

Physical/emotional/mental conditions, and hearing and vision impairment, were each significantly associated with an approximate 2-fold increase in odds of reporting moderate to high levels of suicide behaviors, which is consistent with prior studies among non-AI/AN populations demonstrating that physical impairment and disability are related to suicidality[27–29] and that these factors are associated with higher suicide risk above and beyond the effects of mental health issues.[30] Asking students to report physical impairment and disability issues, along with suicide risk assessments, may improve students' connection to important resources and support tailored to these students' unique needs.

Among the 3,115 students responding to MINI suicide behavior items, the odds of reporting moderate/high levels of suicide behaviors were 25% lower when students reported higher levels of emotional support. Similarly, the odds of reporting moderate/high levels of suicide

behaviors were 31% lower when students reported higher levels of instrumental social support. Modifying emotional and instrumental social support within the TCU setting may be challenging due to potential restraints on resources, yet feasible given the high need and the potential for suicide behavior risk reduction for students who may fall within these categories. Correspondingly, critical appraisal and critical isolation were both associated with higher odds of reporting moderate/high levels of suicide behaviors. These factors may also be changed within TCU settings through improved education, access to behavioral health services, and community campaigns to support changes in interpersonal communication styles, and inclusion in community events.

Resilience is perhaps less modifiable, yet also was associated with lower odds of reporting moderate/high levels of suicide behaviors among participating TCU students. It may be useful to conceptualize student risk of suicide behaviors by taking into account resiliency. For example, TCU communities' efforts to develop student support services may be informed by efforts to prioritize supporting and developing student resilience. More research is needed to clarify community-level factors that may be modifiable to lower student risk of suicide.

The use of self-report screening measures to assess psychiatric disorders and disability status represents a key study limitation. Moreover, suicide behaviors were assessed online, without in-person, clinical assessments to confirm diagnoses. In addition, the cross-sectional study design does not allow for temporal or causal associations among variables. Further, risk and protective factors associated with moderate/high levels of suicide behaviors, as defined in this study, may not be the same as for completed suicide. However, the current study is one of the first to provide an up-to-date estimate of the prevalence of suicide behaviors in a large, nationally representative sample of tribal college students, and to identify risk and protective factors for suicide behaviors specific to this group.

These results may not apply within non-TCU settings. TCU contexts are unique, with many reflecting the cultural and social norms of the local AI/AN reservation. Others are located in urban settings, with representation from multiple AI/AN tribal backgrounds. The important cultural aspects of these contexts may offer key opportunities to build stronger networks of support, and to tailor support services specific to students with disabilities. However, these students may not be representative of tribal populations in general, as they represent a smaller, self-selected group that may not be representative of the overall population.

References

1. Herne MA, Bartholomew ML, Weahkee RL. Suicide mortality among American Indians and Alaska Natives, 1999–2009. *Am J Public Health*. 2014;104(Suppl 3):S336-S342.
2. Parker M, Duran B, Rhew I, et al. Prevalence of moderate and acute suicidal ideation among a national sample of Tribal College and University Students 2014–2015. *Arch Suicide Res*. 2019:1-18.
3. Leavitt RA, Ertl A, Sheats K, Petrosky E, Ivey-Stephenson A, Fowler KA. Suicides among American Indian/Alaska Natives — National Violent Death Reporting System, 18 states, 2003–2014. *MMWR Morb Mortal Wkly Rep*. 2018;67(8):237-242.
4. Rousey A, Longie E. The tribal college as family support system. *Am Behav Sci*. 2001;44(9):1492-1504.
5. Baldwin LM, Hollow WB, Casey S, et al. Access to specialty health care for rural American Indians in two states. *J Rural Health*. 2008;24(3):269-278.
6. Huyser K, Takai I, Sakamoto A. Demographic factors associated with poverty among American Indians and Alaska Natives. *Race Soc Prob*. 2014;6(2):120-134.
7. Van Orden KA, Witte TK, Cukrowicz KC, Braithwaite SR, Selby EA, Joiner TE Jr. The interpersonal theory of suicide. *Psychol Rev*. 2010;117(2):575-600.
8. Fanning JR, Pietrzak RH. Suicidality among older male veterans in the United States: results from the National Health and Resilience in Veterans Study. *J Psychiatr Res*. 2013;47(11):1766-1775.
9. Richmond CA, Ross NA, Egeland GM. Social support and thriving health: a new approach to understanding the health of indigenous Canadians. *Am J Public Health*. 2007;97(10):1827-1833.
10. Oetzel J, Duran B, Jiang Y, Lucero J. Social support and social undermining as correlates for alcohol, drug, and mental disorders in American Indian women presenting for primary care at an Indian Health Service hospital. *J Health Commun*. 2007;12(2):187-206.
11. Roy A, Carli V, Sarchiapone M. Resilience mitigates the suicide risk associated with childhood trauma. *J Affect Disord*. 2011;133(3):591-594.
12. Chino M, Fullerton-Gleason L. Understanding suicide attempts among American Indian adolescents in New Mexico: modifiable factors related to risk and resiliency. *Ethn Dis*. 2006;16(2):435-442.
13. Giannini MJ, Bergmark B, Kreshover S, Elias E, Plummer C, O'Keefe E. Understanding suicide and disability through three major disabling conditions: intellectual disability, spinal cord injury, and multiple sclerosis. *Disabil Health J*. 2010;3(2):74-78.
14. Dodd J, Hermanson M, Landstrom B, Nelson J, Rose P. Tribal college student attitudes toward accommodations for students with learning disabilities. *Tribal Coll*. 1991;3(1):22-26.

15. Kitcheyan C, Sanderson P, Rosen-Reynoso M, Sotnik P. A preliminary investigation of a tribal college's educational supports for individuals with disabilities. *J Appl Rehabil Counsel*. 2017;48(4):38-45.
16. Patterson Silver Wolf D, Vanzile-Tamsen C, Black J, Billiot S, Tovar M. Impact of disability and other physical health issues on academic outcomes among American Indian and Alaskan Native College Students: an exploratory analysis. *J Soc Work Disabil Rehabil*. 2015;14(3-4):208-221.
17. Walters KL, Simoni JM. Reconceptualizing native women's health: an "indigenist" stress-coping model. *Am J Public Health*. 2002;92(4):520-524.
18. Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. *Annu Rev Public Health*. 1998;19:173-202.
19. Lecrubier Y, Sheehan D, Weiller E, et al. The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: reliability and validity according to the CIDI. *Eur Psychiatry*. 1997;12(5):224-231.
20. Sheehan D, Lecrubier Y, Harnett-Sheehan K, et al. Reliability and validity of the AMINI International Neuropsychiatric Interview (M.I.N.I.): according to the SCID-P. *Eur Psychiatry*. 1997;12(5):232-241.
21. Sheehan DV, Lecrubier Y, Sheehan KH, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry*. 1998;59(Suppl 20):22-33;quiz 34-57.
22. Roaldset JO, Linaker OM, Bjorkly S. Predictive validity of the MINI suicidal scale for self-harm in acute psychiatry: a prospective study of the first year after discharge. *Arch Suicide Res*. 2012;16(4):287-302.
23. Williams DR, Yan Y, Jackson JS, Anderson NB. Racial differences in physical and mental health: socio-economic status, stress and discrimination. *J Health Psychol*. 1997;2(3):335-351.
24. American Community Survey. United States Census Bureau; 2014. https://www2.census.gov/programs-surveys/acs/methodology/questionnaires/2014/quest14.pdf. Accessed January 23, 2020.
25. *Stata Statistical Software: Release 14* [computer program]. College Station, TX: StataCorp LP; 2014.
26. Simmons TM, Novins DK, Allen J. Words have power: (re)-defining serious emotional disturbance for American Indian and Alaska Native children and their families. *Am Indian Alsk Native Ment Health Res*. 2004;11(2):59-64.
27. Conwell Y, Duberstein PR, Cox C, Herrmann J, Forbes N, Caine ED. Age differences in behaviors leading to completed suicide. *Am J Geriatr Psychiatry*. 1998;6(2):122-126.
28. Juurlink DN, Herrmann N, Szalai JP, Kopp A, Redelmeier DA. Medical illness and the risk of suicide in the elderly. *Arch Intern Med*. 2004;164(11):1179-1184.
29. Kaplan MS, McFarland BH, Huguet N, Newsom JT. Physical illness, functional limitations, and suicide risk: a population-based study. *Am J Orthopsychiatry*. 2007;77(1):56-60.
30. Waern M, Rubenowitz E, Wilhelmson K. Predictors of suicide in the old elderly. *Gerontology*. 2003;49(5):328-334.