A POSITIVE YOUTH DEVELOPMENT PERSPECTIVE ON MENTAL DISTRESS AMONG AMERICAN INDIAN/ALASKA NATIVE YOUTH

Ozge Ersan, MA, and Michael C. Rodriguez, PhD

Abstract: Positive youth development approaches with American Indian/ Alaska Native (AI/AN) youth have been particularly successful and promising. Utilizing a survey with 3,736 AI/AN students, we investigated the associations between risk and protective factors and significant mental distress of AI/AN youth. The protective factors were studied within the positive youth development framework, which includes positive developmental assets reflecting aspects of the Circle of Courage, a prior framework embodying core indigenous values for youth development and education to support youth at risk. Risk factors in the study included having experienced trauma, being bullied by peers, substance use, and skipping school; protective factors were social supports, out-of-school-time activity participation, healthy eating, and healthy sleeping behaviors. Through logistic regressions, we found that risk factors were associated with more mental distress, consistent with prior research. However, students who participated in out-of-school-time activities at least three times a week, were sleeping at least eight hours daily, and those reporting social supports, particularly family/community support and sense of empowerment, had lower likelihood of mental distress. In fact, the presence of these protective factors reduced the associations of risk factors and risky behaviors with mental distress.

INTRODUCTION

Although student learning, school success, and meeting state educational achievement standards are top education topics, mental health as a part of student wellness has gained substantial public awareness (e.g., EAB, 2020; National Association of Secondary School Principals, 2019; Shallowhorn, 2018). Considering the association between mental distress and educational attainment and academic achievement, mental distress is a component of educational

disparities (Becker & Luthar, 2002; Breslau et al., 2008; DeSocio & Hootman, 2004), where researchers acknowledge that some adolescent groups suffer from more considerable mental distress, such as American Indian and Alaska Native (AI/AN) youth.

AI/AN adolescents reported the highest rates of mental health issues, including depression and anxiety, compared to their peers with different racial/ethnic backgrounds (National Institute of Mental Health [NIMH], 2019; Serafini et al., 2017). Moreover, AI/AN adolescents had the highest suicide rates relative to other races/ethnicities in the United States (Center for Disease Control and Prevention [CDC], 2020; Jiang et al., 2015). For instance, in 2012–2013, the suicide rate among young adults 18 to 24 years old was 22.5% for AI/ANs, higher than White (15.4%), Latino (8.3%), Black (8.9%), and Asian (9.4%) young adults (Jiang et al., 2015). In addition, the intentional self-harm rate was highest for AI/AN youth aged 14 to 19 (CDC, 2020). Relatedly, alcohol use, smoking, and substance use were more prevalent among AI/AN youth (Substance Abuse and Mental Health Services Administration [SAMHSA], 2017). These disparities are well documented.

Mental health status is an important part of youth social, emotional, and academic development. Nevertheless, AI/AN students have been historically underserved (Guillory & Wolverton, 2008), and research regarding their academic and developmental outcomes is limited, due to consistently small samples (Peng & Wright, 1994; Hughes et al., 2009) and the complexity of racial, ethnic, and tribal characteristics (Demmert et al., 2006; Wall et al., 2000). Therefore, knowledge and practice regarding AI/AN student experiences and contexts must be understood to better meet their needs and support thriving, including both risk factors that affect their mental health status and protective factors that support their development.

In this study, we addressed mental health status and its associations with risk[1] and protective[2] factors. Using the 2019 Minnesota Student Survey (MSS), with a large sample of AI/AN students, we examined positive youth development perspectives of AI/AN students, including developmental supports and challenges, healthy lifestyle status, and family and social contexts. In examining elements of the ecology of youth development and the occurrence of mental distress, we offer a different elucidation of the developmental journeys of AI/AN students.

[1] Variables associated with a higher likelihood of negative outcomes (SAMHSA, 2019).
[2] Variables associated with a lower likelihood of negative outcomes or that reduce a risk factor's impact (SAMHSA, 2019).

Risk Factors Associated with Mental Distress

Described in Burnette and Figley's systematic review (2016), risk factors associated with the mental wellness of AI/AN adolescents include societal (e.g., historical oppression, discrimination), cultural (e.g., ethnic identity, spirituality, cultural connectedness), individual (e.g., self-esteem and self-worth, substance use, depression, self-care), familial (e.g., lack of family support, family income, parental mental health, family trauma and stressful life events), and community (e.g., community and school environments, peer influence and support) factors.

As a societal factor, longstanding historical trauma (e.g., negative stereotypes, microaggressions, forced relocation, and prohibition of cultural practices) has lasting impacts on the mental health and well-being of AI/AN communities and is a risk factor for mental distress (Brendtro et al., 2019; Campbell & Evans-Campbell, 2011; Evans-Campbell, 2008). Children and youth carry, as mental distress (emotional, behavioral, and mental health problems), lingering intergenerational trauma (Brokenleg, 2017). Cultural factors or assets, including cultural and ethnic identity, commitment to cultural tribal spirituality, and belonging to one's own culture and value systems, are associated with positive mental health and well-being and lower mental distress and suicide ideation (Garroutte et al., 2003; Hill, 2009; LaFromboise et al., 1993; Masotti et al., 2020).

Individual factors, such as sex, age, family socio-economic status (SES), and race/ethnicity, are strongly associated with mental distress among adolescents. For instance, females and older youth have higher risk of experiencing mental distress or depressive symptoms (Ersan et al., 2018; NIMH, 2019). Similarly, adolescents from families with low SES are more likely to experience mental health problems (Schraedley et al., 1999). Low SES is associated with mental health problems directly, as well as indirectly, through individual (e.g., low quality of nutritional intake), relational (e.g., unhealthy social relationships with family members and peers), or institutional (e.g., school, neighborhood, unstable parental employment) factors (Yoshikawa et al., 2012). Moreover, mixed-race status is associated with higher risk of general health problems and mental health and behavioral problems among youth (Ersan et al., 2018; Garcia et al., 2019; Udry et al., 2003).

Negative family environments are another risk factor. AI/AN youth receiving mental health services reveal high rates of traumatic experiences, such as witnessing domestic violence or experiencing physical, emotional, and sexual abuse at the hands of family members, or living with someone who has substance abuse problems or engages in criminal activity (Borowsky et al., 1999; Burnette & Figley, 2016; Dickerson & Johnson, 2012; Grossman et al., 1991).

Similarly, negative school environments pose community-related risk factors. AI/AN youth often face peer victimization that includes behaviors like racism, cultural insensitivity, and stereotyping that leads to feelings of isolation, low self-esteem, and hopelessness in AI/AN youth (Galliher et al., 2011; Gloppen et al., 2018; Jaramillo et al., 2016; Messias et al., 2014; Silmere & Stiffman, 2006). Youth subsequently internalize these feelings, experience depression, or engage in high-risk behaviors, such as substance use (Boyd-Ball et al., 2006; Johnson & Tomren, 1999; Whitbeck et al., 2001) and suicide attempts (Barlow et al., 2012; Yu et al., 2005). Moreover, school absenteeism is associated with higher risk of depression, suicide ideation, self-harm, social exclusion, and lack of school connectedness, and these factors negatively impact adolescents' emotional and mental health (Burton et al., 2014; Epstein et al., 2019; Gonzálves et al., 2018; Langille et al., 2015; Shochet et al., 2006).

Positive Youth Development

In this study, we promote a positive youth development framework providing an ecological and asset-based approach to AI/AN students' mental health. We also connect positive youth development through an indigenous perspective on youth development through the Circle of Courage.

Positive youth development (PYD) is a framework to bring greater attention to positive aspects of youth development through assets, relationships, and environments that support youth thriving, acknowledging youth as the focus of their own development. The framework indicates when youth participate in multiple meaningful relationships, contexts, and environments, positive development is enhanced (Benson, 1990, 2002; Benson et al., 2006; Lerner et al., 2011). Adolescents who have greater assets (e.g., high level of social supports, empowerment, social competence, positive identity) have lower risk of engaging in alcohol use, aggressive behaviors, and depression and have higher grades in school (Benson et al., 2011; Kang et al., 2018). Most notably, the role and function of developmental assets are relevant and important to youth from diverse communities, including youth from different racial and ethnic communities (Aspen Institute, 2018; Benson et al., 2006).

Family and community social supports benefit AI/AN students' social, emotional, mental, and academic well-being (Benson et al., 2006). Parental support, for instance, is a positive factor in AI/AN students' schooling (Okagaki et al., 2009), and AI/AN adolescents who have peer support are more resilient in general (Stumblingbear-Riddle & Romans, 2012). Most importantly,

social supports lower depressive symptoms, promote social and emotional well-being (Cummins et al., 1999; Sherman et al., 2011), and decrease substance use (Kulis et al., 2002). Belongingness and social connectedness are critical basic human motivations (Baumeister & Leary, 1995), particularly for AI/AN youth, where belonging to community is a significant element of identity (Brendtro et al., 2019).

In addition to family and community support, feeling safe in families, schools, and neighborhoods (Côté-Lussier & Fitzpatrick, 2016; Cummins et al., 1999; Meltzer et al., 2007) and being empowered by family warmth and connectedness are additional protective factors associated with lower mental distress and depressive symptoms (Cummins et al., 1999; Whitbeck et al., 2009). Moreover, feelings of school connectedness and having a fair, trustworthy school environment play significant roles in students' mental health (Cummins et al., 1999).

From a PYD perspective, high quality out-of-school-time (OST) activity participation is associated with positive developmental outcomes. For instance, participation in school sports is positively associated with developmental skills and social supports and negatively associated with developmental challenges, including depression, anxiety, and other mental distress (Fraser-Thomas et al., 2005; Hosker et al., 2019; Mason et al., 2009; Van Boekel et al., 2016; Zhu et al., 2019). Participating in structured leisure activities, such as sports, arts, or youth organizations, has a positive impact on development of initiative that is an essential skill on the human development continuum through adulthood (Larson, 2000). For disadvantaged youth with mental health challenges, higher frequency of OST activity participation is associated with higher interpersonal strengths and lower internalizing problems (Abraczinskas et al., 2016).

Finally, maintaining a healthy lifestyle, including eating nutritional diets and getting enough sleep, is important for overall health and wellness. More specific to mental health, sleeping 8 to 10 hours a day on a regular basis, as recommended for teenagers, is associated with better mental and physical health (Hosker et al., 2019; Paruthi et al., 2016; Tarokh et al., 2016) and improved school outcomes (Wahlstrom, 2016). A healthy diet of regularly eating vegetables, fruits, proteins, and healthy grains, as well as limiting sugary drinks and fast foods, have significant, although small, positive associations with lower depression and anxiety (Jacka et al., 2011; Khalid et al., 2017; O'Neil et al., 2014) and are important in maintaining a healthy lifestyle (Hosker et al., 2019).

The Circle of Courage

The PYD framework primarily directed our work. However, we acknowledge an earlier form of PYD relevant for AI/AN youth, the Circle of Courage, which was introduced in 1990 by Brendtro et al. (2019; third edition), predating the introduction of positive psychology by Seligman and Csikszentmihalyi in 2000. There are meaningful connections between the Circle of Courage and PYD frameworks. The Circle of Courage is formulated in indigenous sacred contexts of the four directions and the medicine wheel. The four core values embodied in the Circle of Courage include belonging, mastery, independence, and generosity.

The spirit of belonging transcends kinship (where kinship is more than biology) and encompasses the recognition of interdependence, not only among people, but all living things, the environment, and Earth. Belonging to community is a significant element of identity. Notions of belonging are similar to PYD concepts of family and community support.

The spirit of mastery is realized through meaningful and appropriate opportunities to learn, to achieve competencies, and to become a model for others. Achievement motivation is essential for positive cognitive, social, emotional, physical, and spiritual competence. In PYD, mastery is developed through supports from family, community, teachers, and schools. Many youth develop important skills through participation in OST activities, particularly those that are culturally grounded.

The spirit of independence includes not only autonomy, but self-control, self-confidence, and shared responsibility. In contrast, mainstream cultural notions of independence focus on assertiveness, competition, and individualism that may lead to a sense of powerlessness, learned helplessness, disengagement, and alienation. In PYD, the related concept of empowerment rests on a sense of safety at home, school, and community; feeling appreciated; and having responsibilities and meaningful roles in the family. Independence is developed through multiple support systems and engagement in meaningful OST activities.

The spirit of generosity is presented as the highest virtue in many indigenous legends and stories; “it is mapped in our genes” (Brendtro et al., 2019, p. 25). When adults give to others in need, children and youth participate in generosity. In PYD, generosity is exemplified through service-learning activities and community engagement, opportunities to engage in caring for others, and promoting self-worth and community-worth by serving others.

Therefore, the Circle of Courage is, in part, characterized in this study through the inclusion of indicators for tribal membership, teacher and school support, family and community support,

empowerment, and participation in OST activities, as well as self-care through healthy diets and sleep, all elements of PYD.

Study Purpose

The purpose of this study was to estimate the strength of associations between mental distress and demographic characteristics, risk factors, risky behaviors, and protective factors. In addition, the effects of risk factors and risky behaviors was examined in the presence of protective factors including social support measures, OST activity participation, and healthy behaviors, from a PYD framework. Four research questions were posed:

1. To what extent are student characteristics associated with mental distress?
2. To what extent are risk factors and risky behaviors associated with mental distress (beyond demographics)?
3. To what extent are developmental supports and positive assets associated with mental distress (beyond demographics)?
4. To what extent are demographics, risk factors and risky behaviors, and developmental supports and positive assets simultaneously associated with mental distress?

METHODS

Instrument

The data were from the 2019 Minnesota Student Survey ([MSS], Minnesota Department of Education, 2019), designed by the Departments of Education, Health, Human Services, and Public Safety, administered triennially and anonymously to fifth, eighth, ninth, and eleventh grade public-school students. The purpose of the MSS is to monitor trends in students' well-being, developmental skills and supports, and positive and risky behaviors. Fifth grade students were not asked questions regarding mental health, thus were excluded.

The MSS Interagency Team provided the researchers access to the survey database for secondary data analyses, as part of a larger research program investigating the ecologies of PYD (Minnesota Youth Development Research Group, n.d.), with institutional review board approval.

Participants

Participants included 3,736 AI/AN students in eighth (38%), ninth (38%), and eleventh (24%) grade, where 53% identified themselves as female and 34% lived in the Twin Cities metropolitan area. The mean age was 14.7 (*SD* = 1.3). About 60% of AI/AN students reported experiencing mental distress, although much higher among females (71%) than males (48%). Students could select all racial/ethnic categories to which they identified. Accordingly, 30% of the AI/AN participants reported only AI/AN identification, and 70% identified with multiple racial/ethnic groups. The most common combination included White (44%), followed by Black (4%), other (5%), or combinations of Asian, Black, White, and Latino (18%). Additionally, three options for tribal affiliation were available; students identified themselves as Anishinaabe/Ojibwe (51%) and Dakota/Lakota (17%), the two largest tribal communities in Minnesota, with the remaining in the *other tribal affiliation* category (34%).

Measures

All study variables, associated items from the MSS, and response options for each item are listed in Appendix Table A1.

Mental Distress

Mental distress was measured in the MSS (Rodriguez, 2017) as a severe form of mental distress, including having long-term mental health, behavioral, or emotional problems; having been treated for mental health, emotional, or behavioral problems; having considered or attempted suicide; or purposefully hurting or injuring oneself. The dichotomous mental distress indicator identified students who reported experiencing at least one instance of severe mental distress. AI/AN youth had the largest percentage (60%) with mental distress, followed by multiracial/ethnic students (48%), Latino students (46%), White students (40%), Black students (37%), and Asian students (34%).

Demographics

Demographic variables included age, sex (male as reference group), and participation in free/reduced priced lunch (a proxy for low SES). Racial identification was grouped into five categories with AI/AN-only as the reference group, including AI/AN-White, AI/AN-Black, AI/AN with other races/ethnicities (Asian-Pacific Islander, Latino), and AI/AN-multiple races/ethnicities (more than two). Tribal affiliation was grouped into three categories: Anishinaabe/Ojibwe, Dakota/Lakota, and other tribal affiliation (reference group).

Risk Factors

Trauma, a dichotomous variable, indicated students who reported they had experienced at least one trauma event, consistent with the Adverse Childhood Experiences used by the CDC (2020; see Table A1 in Appendix). Being bullied was a continuous measure (based on 14 items; see Table A1 in Appendix).

Risky Behaviors

Substance use, a dichotomous variable, indicated students who reported they used alcohol, marijuana, or other drugs at least once during the last 12 months. Skipping school, a dichotomous variable, indicated students who reported they missed at least one full day of school during the last 30 days without an excuse.

Social Support

Family/community support, sense of empowerment (Empowerment from the Search Institute [2013] Developmental Asset Profile), and teacher/school support were continuous measures of social supports created based on students' self-reported responses to the relevant items (see Table A1 in Appendix).

Two primary sources of validity evidence for MSS measures included content-related evidence (documented in Benson, 1990, 2002; Benson et al., 2006; Search Institute, 2013) and construct-related evidence obtained from 2013, 2016, and 2019 MSS data (Rodriguez, 2017). To support construct-related inferences, the internal structure of the measures was evaluated through confirmatory factor analysis (CFA; using Mplus v.7; Muthén & Muthén, 2012). Overall, the fit indices, factor loadings, and correlations supported the use of these items as indicators of developmental support measures (Rodriguez, 2017). The support measures were scored using the partial credit Rasch model (Masters, 1982) in Winsteps 4.4.7 (Linacre, 2019). Each continuous measure was standardized with a minimum score of zero for analysis.

Out-of-school-time (OST) Activity Participation

Students were asked how many days in a typical week they participate in any of six categories of OST activities (see Table A1 in Appendix). The OST activity participation was an indicator of participating in one or more OST activities at least three times a week.

Nutrition and Sleep

Healthy dieter was a dichotomous indicator for students who reported to eat fruit and vegetables at least 4 times in the last 7 days. Similarly, healthy sleeper was a dichotomous indicator

for students who reported to sleep at least 8 hours in a typical school night (based on recommendations of the American Academy of Sleep Medicine; Paruthi et al., 2016).

Statistical Analysis

We first examined frequencies and descriptive statistics of each variable (Tables 1 and 2), as well as intercorrelations among variables (Table A2 in Appendix). The study has a cross-sectional design where magnitude of associations were examined. We employed four logistic regression models to answer each of the research questions. Accordingly, in the first model, odds of having mental distress was examined as a function of student characteristics only. In Model 2, risk factors and risky behaviors, and in Model 3, protective factors (social supports, OST activity participation, and healthy behaviors), were added separately in addition to the student characteristics. Finally, all the study variables were examined in Model 4 (full model). Since the outcome measure, mental distress, was dichotomous, the logistic regression coefficient was the estimated change in the log-odds of experiencing mental distress, due to the presence of a student characteristic or one-unit change in the value of the continuous variables (Szumilas, 2010).

The exponential function of the regression coefficients correspond to the odds ratio (OR) of having experienced mental distress. ORs provide relative odds of having experienced mental distress. Accordingly, the adjusted OR equals the ratio of having experienced mental distress to not having experienced mental distress, conditioned on an explanatory variable, or when controlling others. For each logistic regression model, OR and 95% confidence intervals were reported. We presented McFadden's Pseudo-R^2 (an approximation of the proportion of variance explained by explanatory variables appropriate for logistic regression; Smith & McKenna, 2013) and Akaike Information Criterion (AIC; Bozdogan, 1987) for each model for model comparison.

RESULTS

Descriptive Statistics

The frequencies and descriptive statistics of each variable used in this study were reported in Table 1 and Table 2, by mental distress status. In addition, we reported the OR of having experienced mental distress given each explanatory variable independently (relative to the reference group). These are unadjusted ORs, examining the effect of each group characteristic or

lowest level of each continuous variable (age, being bullied, family/community support, sense of empowerment, teacher/school support).

Table 1 shows the frequency and proportion distributions of the levels of given categorical explanatory variables. The ORs for categorical variables indicate change in OR for the remaining groups relative to the reference category. Table 2 contains continuous explanatory variables and shows their means and standard deviations. Accordingly, being bullied, family/community support, sense of empowerment, and teacher/school support were centered so that minimum value is 0 with *SD* = 1.0. The OR for age is the change in OR for each additional year of age. For being bullied, family/community support, sense of empowerment, and teacher/school support, ORs represent the change in odds of having experienced mental distress for a one *SD* increase in the measure score.

Table 1

Frequencies and Proportions of the Levels of Categorical Explanatory Variables as a Function of Mental Distress Status and Independent Bivariate Logistic Regression Results

	Not experiencing mental distress (*n* = 1503, 40%)		**Experiencing some mental distress (*n* =2233, 60%)**		**Logistic regression odd ratios**	
	n	**%**	***n***	**%**	**OR**	**95% CI**
Demographics						
Free/reduced priced lunch						
No (reference)	759	48	839	52		
Yes	744	35	1394	65	1.70***	[1.49, 1.95]
Gender						
Male (reference)	925	52	847	48		
Female	578	29	1386	71	2.62***	[2.29, 3.00]
Race						
AI/AN (reference)	472	42	638	58		
AI/AN-White	670	41	966	59	1.07	[0.91, 1.24]
AI/AN-Black	68	47	78	53	0.85	[0.60, 1.20]
AI/AN-other	77	46	91	54	0.87	[0.63, 1.21]
AI/AN-multi	216	32	460	68	1.58***	[1.29, 1.93]
Tribe						
Other (reference)	564	40	832	60		
Anishinaabe/Ojibwe	740	40	1107	60	1.02	[0.89, 1.17]
Dakota/Lakota	199	40	294	60	1.06	[0.88, 1.27]
Risk factors						
Trauma						
No (reference)	808	61	522	39		
Yes	695	29	1711	71	3.81***	[3.31, 4.39]

continued on next page

Table 1 Continued

Frequencies and Proportions of the Levels of Categorical Explanatory Variables as a Function of Mental Distress Status and Independent Bivariate Logistic Regression Results

	Not experiencing mental distress (*n* = 1503, 40%)		Experiencing some mental distress (*n* =2233, 60%)		Logistic regression odd ratios	
	n	**%**	***n***	**%**	**OR**	**95% CI**
Risky behaviors						
Substance use						
No (reference)	1151	52	1045	48		
Yes	352	23	1188	77	3.72***	[3.22, 4.30]
Skip school or class						
No (reference)	629	47	711	53		
Yes	874	36	1522	64	1.54***	[1.35, 1.76]
Protective factors						
Out-of-school-time activities						
No (reference)	659	34	1252	66		
Yes	844	46	981	54	0.61***	[0.54, 0.70]
Healthy diet						
No (reference)	782	38	1292	62		
Yes	721	43	941	57	0.79***	[0.69, 0.90]
Healthy sleep						
No (reference)	916	34	1738	66		
Yes	587	54	495	46	0.44***	[0.38, 0.51]

Note. *p < .05. **p < .01. *** p< .001.

Table 2

Means and Standard Deviations of Continuous Explanatory Variables as a Function of Mental Distress Status and Independent Bivariate Logistic Regression Results

	Not experiencing mental distress (*n* = 1503, 40%)		Experiencing some mental distress (*n* =2233, 60%)		Logistic regression odd ratios	
	M	***SD***	***M***	***SD***	**OR**	**95% CI**
Demographics						
Age	14.6	1.27	14.7	1.26	1.06*	[1.01, 1.12]
Risk factors						
Being bullied	0.85	0.90	1.57	0.96	2.19***	[2.03, 2.36]
Protective factors						
Family/community support	3.14	0.96	2.43	0.92	0.46***	[0.42, 0.49]
Empowerment	3.81	0.97	3.04	0.89	0.42***	[0.39, 0.45]
Teacher/school support	3.24	0.97	2.76	0.97	0.60***	[0.56, 0.65]

Note. *p < .05. **p < .01. *** p< .001.

Logistic Regression Results

Logistic regression models in Table 3 correspond to each research question; all of the ORs in Table 3 are adjusted ORs, conditioned on the other variables within the model. Regarding demographic variables, age (*OR* = 1.09), participation in free/reduced priced lunch (OR = 1.79), and being female (*OR* = 2.60) were positively associated with higher odds of mental distress (Model 1). For example, the odds of having mental distress for females was 2.6 times greater than males, conditioned on other student characteristics in the model. Furthermore, students who identified as AI/AN-White (*OR* = 1.18) or AI/AN with multiple racial/ethnic combination (*OR* = 1.54) had higher odds of mental distress than students who identified as AI/AN only, the reference group. For other AI/AN mixed race/ethnicity groups, the odds of having mental distress were not significantly different than AI/AN-only students (possibly due to smaller group size). Regarding tribal identity, the odds of having mental distress for students who identified as Anishinaabe/Ojibwe and Dakota/Lakota were not different than those with other tribal affiliation.

For Model 2, both risk factors (experiencing trauma and being bullied) and risky behaviors (substance use and skipping school) were associated with higher odds of having mental distress, when controlling for demographic characteristics of students. According to Model 2, experiencing trauma (*OR* = 2.42) and being bullied by peers (*OR* = 1.85) were strongly associated with experiencing mental distress. In other words, according to Model 2 results, the odds of having mental distress were 2.42 times and 1.85 times greater for students who experienced trauma and were being bullied, respectively, conditioned on other variables in the models. In addition, the odds of having mental distress were 2.33 times greater for students using any substance (cigarette, alcohol, drug, etc.) compared to students not using substances, and 1.18 times greater for students who skipped school or class than ones who did not, controlling for other variables in the model.

Regarding protective factors, and specifically social supports (Model 3), family/community support (*OR* = 0.70) and sense of empowerment (*OR* = 0.57) were associated with lower ORs of mental distress. However, teacher/school support (*OR* = 1.00) was not associated with the likelihood of experiencing mental distress, when controlling for other variables in the model. Accordingly, one *SD* increase in family/community support was associated with 0.70 times the odds and one *SD* increase in sense of empowerment was associated with 0.57 times the odds of experiencing mental distress; more family/community support and sense of empowerment was associated with substantially lower likelihood of experiencing mental distress.

Similarly, we examined the association of OST activity participation, healthy diet, and healthy sleep with mental distress. When controlling for other variables in the model, OST activity participation (*OR* = 0.82) and healthy sleep (*OR* = 0.73) were associated with lower odds of experiencing mental distress; however, healthy diet was not statistically significantly associated with mental distress. It should be noted that this does not mean eating healthy was not associated with mental distress, rather as shown in Table 1, it was associated with significantly lower odds of having mental distress (*OR* = 0.79). However, when the effects of other variables were included in the model, healthy diet no longer explained significant incremental variation in the odds of having mental distress.

In addition, we examined the proportion of explained variance as a measure of goodness of fit that shows how well the variation in dependent variable is explained approximately by the model. Accordingly, McFadden R^2 showed the increase in variance explained was about .14 when adding risk factors, or there was about .10 additional explained variance when adding protective factors above demographics. Finally, in Model 4, all variables were examined simultaneously, risk and protective factors together explain even more variance (.18) above demographics. Similarly, AIC suggested Model 4 had better model-data fit compared to other models.

Relative to the other models, in Model 4, skipping school (*OR* = 1.12) was no longer significantly associated with mental distress, and teacher/school support (*OR* = 1.15) was significantly associated with mental distress in the unexpected direction. Teacher/school support counterintuitively predicted a slightly higher likelihood of mental distress.

In Model 4, we observed slight changes in most ORs relative to Model 2, which did not include the protective factors. The negative effects of being female, being older adolescent, and having low SES were slightly smaller, and the ORs associated with risk factors and risky behaviors were smaller, especially with trauma. Without the inclusion of protective factors, the OR for mental distress associated with trauma experiences was 2.42; with protective factors the OR was 1.90. In the presence of the few protective factors included in this model, the adjusted odds of experiencing mental distress being associated with experiencing trauma was reduced by about 37% ([2.42-1.90] / [2.42-1.00]). Similarly, the adjusted odds of experiencing mental distress being associated with being bullied and substance use were reduced by about 18% and 15%, respectively, comparing Model 4 to Model 2.

Table 3

Logistic Regression Results Predicting Mental Distress

Variables	Model 1		Model 2		Model 3		Model 4	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Demographics								
Age	1.09**	[1.03, 1.15]	1.09**	[1.03, 1.16]	1.06*	[1.02, 1.16]	1.08*	[1.01, 1.15]
Free/reduced priced lunch	1.79***	[1.55, 2.06]	1.49***	[1.27, 1.75]	1.49***	[1.15, 1.60]	1.32**	[1.12, 1.56]
Female	2.60***	[2.26, 2.98]	2.23***	[1.91, 2.59]	2.21***	[1.79, 2.45]	2.10***	[1.79, 2.46]
Race								
AI/AN-White	1.18*	[1.00, 1.40]	1.24*	[1.03, 1.49]	1.20*	[1.01, 1.47]	1.25*	[1.03, 1.51]
AI/AN-Black	0.72	[0.50, 1.04]	0.71	[0.47, 1.05]	0.77	[0.49, 1.11]	0.78	[0.52, 1.17]
AI/AN-other	0.74	[0.53, 1.04]	0.73	[0.50, 1.07]	0.68*	[0.47, 1.04]	0.71	[0.48, 1.05]
AI/AN-multi	1.54***	[1.24, 1.91]	1.44**	[1.14, 1.83]	1.52***	[1.16, 1.88]	1.50**	[1.17, 1.92]
Tribe								
Anishinaabe/Ojibwe	0.97	[0.84, 1.12]	0.88	[0.75, 1.03]	0.91	[0.74, 1.03]	0.87	[0.74, 1.03]
Dakota/Lakota	1.08	[0.90, 1.31]	0.98	[0.79, 1.21]	0.98	[0.77, 1.18]	0.95	[0.76, 1.18]
Risk factors/behaviors								
Trauma			2.42***	[2.06, 2.85]			1.90***	[1.61, 2.26]
Being bullied			1.85***	[1.70, 2.00]			1.70***	[1.56, 1.86]
Substance use			2.33***	[1.98, 2.75]			2.13***	[1.79, 2.53]
Skip school or class			1.18*	[1.01, 1.39]			1.12	[0.95, 1.32]
Protective factors								
Family/community support					0.70***	[0.67, 0.84]	0.77***	[0.69, 0.86]
Empowerment					0.57***	[0.57, 0.71]	0.66***	[0.59, 0.73]
Teacher/school support					1.00	[1.04, 1.26]	1.15**	[1.04, 1.26]
Out-of-school-time activities					0.82**	[0.61, 0.84]	0.71***	[0.61, 0.84]
Healthy diet					1.12	[0.93, 1.29]	1.09	[0.93, 1.29]
Healthy sleep					0.73***	[0.68, 0.96]	0.81*	[0.68, 0.96]
Model fit								
Model loglikelihood	-2369.317		-2015.542		-2100.143		-1911.440	
Null model loglikelihood	-2517.817		-2517.817		-2517.817		-2526.198	
McFadden R^2	.059		.199		.166		.241	
AIC	4758.6		4059.1		4232.3		3862.9	

Note. Age was centered so that minimum value is 0. Being bullied, Family/community support, Empowerment, and Teacher/school support were centered so that minimum value is 0 with *SD*=1.0. OR = adjusted odds ratio. *p < .05. **p < .01. *** p< .001.

DISCUSSION

For the first research question, we examined the associations between AI/AN students' background variables and mental distress. We found that AI/AN students who are older, lower SES, and female have higher likelihoods of mental distress. Additionally, students who identify as AI/AN-White and AI/AN with multiple racial/ethnic combinations have higher likelihoods of mental distress than students who identify as AI/AN only (reference group), although students identifying as AI/AN (regardless of other race/ethnicities) do report higher likelihoods of mental distress than students who do not identify as AI/AN. This increased likelihood of mental distress could reflect a history of trauma, colonization, and assimilation. That is, this history may impact how students perceive the extent to which they belong to their educational and social environments (Baumeister & Leary, 1995), as one example, that subsequently contributes to their likelihood of mental distress. The complexity introduced by multi-racial AI/AN students and AI/AN-White students likely indicates the struggles students with multiracial backgrounds face that may present conflicting ways of knowing or being, greater exclusion or isolation, and unique forms of discrimination (Sanchez, 2010; Shih & Sanchez, 2005). However, empirical research on multiracial AI/AN youth is sparse.

From the second research question, we found that risk factors, particularly trauma, are significantly associated with higher likelihood of mental distress. Risky behaviors, including substance use and skipping school, are also associated with higher likelihood of mental distress; simultaneously, risky behaviors are possibly the result of mental distress (bidirectional associations; Kang et al., 2018). These results were expected.

When the protective factors were added into the full model, the magnitudes of the risk factors each dropped, and skipping school was no longer statistically significant. This is the major set of findings: adding protective factors in the model of student characteristics and risk factors and behaviors reduced the likelihood of experiencing mental distress and reduced the negative accumulating effects of risk factors.

Furthermore, we observed that teacher/school support counterintuitively predicted a slightly higher likelihood of mental distress in the full model. We consider two possible explanations for this result. First, we see that the bivariate correlations for family/community support, sense of empowerment, and teacher/school support with mental distress are all negative (Table A2 in Appendix). One explanation is that the partial correlation of teacher/school support

with mental distress, controlling for family/community support and sense of empowerment, is positive. Another possibility is that once we account for family/community support and sense of empowerment, the remaining variance could be due to students who have more mental distress and are seeking out more support from teachers and school personnel (teacher/school support). This finding is important and could serve to highlight the discrepancies between roles of various sources of social support. This deserves further study.

In this quantitative study, we aimed to contribute to AI/AN youth development and mental health programming to promote PYD practices in a way that is consistent with indigenous perspectives of youth development. The Circle of Courage provides a foundation for psychological resilience for Native youth, particularly youth at-risk (Brendtro, 2020; Werner, 2012). For instance, Werner (2012) explained that youth with disadvantaged backgrounds can gain resiliency and thrive in life in conjunction with the elements of the Circle of Courage. Accordingly, the belonging element portrays that youth with adverse life events gain resiliency and thrive in life, with help of social support from peers, extended family members, or community. Mastery element of the Circle of Courage is realized by providing opportunities to youth to feel valued, appreciated, and competent by encouraging sense of empowerment and OST activity participation that also motivates youth to have a purpose in life. Similarly, sense of empowerment, OST activity participation, and self-care through healthy lifestyle can help youth to acquire independence and self-discipline. Lastly, with feelings of belongingness through social supports and OST activity participation, sense of responsibility in a partnership with others is enhanced, reflecting the generosity element of the Circle of Courage.

Limitations

There are some limitations for this study. The first limitation is the focus on AI/AN students in Minnesota, and although the sample includes over 3,700 students, generalizability beyond Minnesota should be done cautiously. Also, in the case of multi-racial AI/AN students, sample sizes were small for some groups. For example, although the ORs were different than 1.0 with AI/AN-Black students for each model, they were not statistically significant (likely due to low power). In addition, there may be a differential threshold for students whose bi-cultural identities are both stigmatized compared to students with only one stigmatized identity, or the two cultures are in conflict. Finally, although the MSS did allow students to identify with Anishinaabe/Ojibwe

and Dakota/Lakota tribal affiliations (the largest groups attending Minnesota schools), one-third of students selected *other tribe* with unknown affiliation.

Since the measures and variables used in the study were based on self-reported responses to the survey items, it should be noted that respondents may tend to be more biased to the items related to negative experiences. Therefore, self-report bias may mask the real magnitude of the associations (Devaux & Sassi, 2015; Krumpal, 2013; Latkin et al., 2017).

CONCLUSION

The socio-cultural and educational contexts for AI/AN students are complex and their mental health outcomes are unacceptable, which begets the need to expand on and increase research activities in this student community. Bivariate associations and correlations are insufficient and do not uncover the whole picture. Risk factors and risky behaviors are consistently associated with mental distress across AI/AN student groups. But most importantly, not only do protective factors reduce the likelihood of mental distress, they also reduce the negative effects of risk factors and behaviors. Educators, counselors, and youth workers can use this information to structure curriculum and after school programs, learning supports, therapy practices, and developmental opportunities, to better support the needs of these students, specifically through better understanding of the events and contexts that contribute to students' elevated mental distress levels. de Heer et al. (2020), and many others (McKinley et al., 2019, Shane et al., 2018), point to the value of collaborations among researchers and practitioners; this is a good place to demonstrate that recommendation.

Social supports reduce the likelihood of mental distress among AI/AN students, particularly family/community support and sense of empowerment. In fact, in the context of such supports, the negative effects of risk factors and behaviors are reduced, particularly the negative effects of experiencing trauma. These findings can equip practitioners with the knowledge to further support AI/AN students, specifically, through a better understanding of which social supports are at play and the importance of context, such as home and school environments. The Circle of Courage, as an indigenous PYD framework, is more than a philosophy; it represents core values for education and youth work in ways that are consistent with our findings. Leveraging the assets, positive supports, and elements reflected in the Circle of Courage, practitioners and policy makers can be better equipped to promote positive mental health among AI/AN students.

REFERENCES

Abraczinskas, M., Kilmer, R., Haber, M., Cook, J., & Zarrett, N. (2016). Effects of extracurricular participation on the internalizing problems and intrapersonal strengths of youth in a system of care. *American Journal of Community Psychology*, *57*, 308–319. https://doi.org/10.1002/ajcp.12048

Aspen Institute. (2018). *Pursuing social and emotional development through a racial equity lens: A call to action*. https://www.aspeninstitute.org/publications/

Barlow, A., Tingey, L., Cwik, M., Goklish, N., Larzelere-Hinton, F., Lee, A., Suttle, R., Mullany, B., & Walkup, J. T. (2012). Understanding the relationship between substance use and self-injury in American Indian youth. *The American Journal of Drug and Alcohol Abuse, 38*(5), 403-408. https://doi.org/10.3109/00952990.2012.696757

Baumeister, R. F, & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497-529. https://doi.org/10.1037/0033-2909.117.3.497

Becker, B. E., & Luthar, S. S. (2002). Social–emotional factors affecting achievement outcomes among disadvantaged students: Closing the achievement gap. *Educational Psychologist, 37*(4), 197-214. https://doi.org/10.1207/S15326985EP3704_1

Benson, P. L. (1990). *The troubled journey: A portrait of 6th to 12th grade youth*. Search Institute. http://pub.search-institute.org/file/archive/1990-Benson-Troubled-Journey.pdf

Benson, P. L. (2002). Adolescent development in social and community context: A program of research. In R. M. Lerner, C. S. Taylor, & A. von Eye (Eds.), *New Directions for Youth Development: Pathways to Positive Development among Diverse Youth, 95*, 123–147.

Benson, P. L., Scales, P. C., Hamilton, S. F., & Sesma, A. (2006). Positive youth development: Theory, research, and applications. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology: Vol. 1* (6th ed., pp. 894-941). John Wiley & Sons.

Benson, P. L., Scales, P. C., & Syvertsen, A. K. (2011). The contribution of the developmental assets framework to positive youth development theory and practice. In R. M. Lerner, J. V. Lerner, & J. B. Benson (Eds), *Advances in child development and behavior, 41*. https://www.sciencedirect.com/bookseries/advances-in-child-development-and-behavior/volumes

Borowsky, I.W., Resnick, M.D., Ireland, M., & Blum, R.W. (1999). Suicide attempts among American Indian and Alaska Native youth: risk and protective factors. *Archives of Pediatric and Adolescent Medicine, 153*(6), 573-580. https://doi.org/10.1001/archpedi.153.6.573

Boyd-Ball, A. J., Manson, S. M., Noonan, C., & Beals, J. (2006). Traumatic events and alcohol use disorders among American Indian adolescents and young adults. *Journal of Traumatic Stress, 19*(6), 937-947. https://doi.org/10.1002/jts.20176

Bozdogan, H. (1987). Model selection and Akaike's Information Criterion (AIC): the general theory and its analytical extensions. *Psychometrika, 52*(3), 345-370. https://doi.org/10.1007/BF02294361

Brendtro, L. K. (2020). Trauma-wise teens. *Thriving, 5*(1). https://growingedgetraining.com/thriving

Brendtro, L.K., Brokenleg, M., & Van Bockern, S. (2019). *Reclaiming youth at risk: our hope for the future* (3rd ed.). Solution Tree Press.

Breslau, J., Lane, M., Sampson, N., Kessler, R. C. (2008). Mental disorders and subsequent educational attainment in a US national sample. *Journal of Psychiatric Research, 42*, 708-716. https://doi.org/10.1016/j.jpsychires.2008.01.016

Brokenleg, M. (2017). *Reclaiming youth at risk: The circle of courage* [Presentation]. Educational Equity in Action Convening, University of Minnesota, Minneapolis, MN. http://www.gap.umn.edu/About/edequityinaction.html

Burnette, C. E., & Figley, C. R. (2016). Risk and protective factors related to the wellness of American Indian and Alaska Native youth: A systematic review. *International Public Health Journal, 8*(2), 137-154.

Burton, C. M., Marshal, M. P., & Chisolm, D. J. (2014). School absenteeism and mental health among sexual minority youth and heterosexual youth. *Journal of School Psychology, 52*(1), 37-47. http://doi.org/10.1016/j.jsp.2013.12.001

Campbell, C. D., & Evans-Campbell, T. (2011). Historical trauma and Native American child development and mental health: An overview. In M. C. Sarche, P. Spicer, P. Farrell, & H. E. Fitzgerald (Eds.), *Child psychology and mental health. American Indian and Alaska Native children and mental health: Development, context, prevention, and treatment* (pp. 1-26). Praeger/ABC-CLIO.

Centers for Disease Control and Prevention. (2020). *1999-2018 Wide Ranging Online Data for Epidemiological Research (WONDER), Underlying Cause of Death* [Data file]. https://wonder.cdc.gov/ucd-icd10.html

Côté-Lussier, C. & Fitzpatrick, C. (2016). Feelings of safety at school, socioemotional functioning, and classroom engagement. *Journal of Adolescent Health, 58*(5), 543-550. http://doi.org/10.1016/j.jadohealth.2016.01.003

Cummins, J., Ireland, M., Resnick, M., & Blum, R. W. (1999). Correlates of physical and emotional health among Native American adolescents. *Journal of Adolescent Health, 24*(1), 38-44. https://doi.org/10.1016/S1054-139X(98)00063-9

de Heer, B., Heffern, J. K., Cheney, J. S., Secakuku, A., & Baldwin, J. (2020). A community-based evaluation of a culturally grounded, American Indian after-school prevention program: The value of practitioner-researcher collaboration. *American Indian and Alaska Native Mental Health Research, 27*(1), 1-20. https://doi.org/10.5820/aian.2701.2020.1

Demmert, W. G., Grissmer, D., & Towner, J. (2006). A review and analysis of the research on Native American students. *Journal of American Indian Education, 45*(3), 5-23. https://jaie.asu.edu/sites/default/files/453_2006_2_demmert_et_al.pdf

DeSocio, J., & Hootman, J. (2004). Children's mental health and school success. *The Journal of School Nursing, 20*(4), 189-196. https://doi.org/10.1177/10598405040200040201

Devaux, M. & Sassi, F. (2015). Social disparities in hazardous alcohol use: self-report bias may lead to incorrect estimates. *European Journal of Public Health, 26*(1), 129–134. https://doi.org/10.1093/eurpub/ckv190

Dickerson, D. L., & Johnson, C. L. (2012). Mental health and substance abuse characteristics among a clinical sample of urban American Indian/Alaska Native youth in a large California metropolitan area: A descriptive study. *Community Mental Health Journal, 48*(1), 56-62. https://doi.org/10.1007/s10597-010-9368-3

EAB. (2020). Are districts the Nation's adolescents mental health care providers? https://eab.com/research/district-leadership/whitepaper/are-districts-the-nations-adolescent-mental-health-care-providers/

Epstein, S., Roberts, E., Sedgwick, R., Polling, C., Finning, K., Ford, T., Dutta, R., & Downs, J. (2019). School absenteeism as a risk factor for self-harm and suicidal ideation in children and adolescents: a systematic review and meta-analysis. *European Child & Adolescent Psychiatry, 29*, 1175-1194. https://doi.org/10.1007/s00787-019-01327-3

Ersan, O., Do, T., Kang, Y., & Rodriguez, M. C. (2018). *Mental distress: Risk and protective factors among American Indian youth* [Paper presentation]. The annual meeting of the American Educational Research Association, New York, NY. https://sites.google.com/view/mnydrg/research

Evans-Campbell, T. (2008). Historical trauma in American Indian/Native Alaska communities: A multilevel framework for exploring impacts on individuals, families, and communities. *Journal of Interpersonal Violence, 23*(3), 316-338. https://doi.org/10.1177/0886260507312290

Fraser-Thomas, J. L., Côté, J., & Deakin, J. (2005). Youth sport programs: An avenue to foster positive youth development. *Physical Education and Sport Pedagogy, 10*(1), 19-40. https://doi.org/10.1080/17408980420003348 90

Galliher, R. V., Jones, M. D., Dahl, A. (2011). Concurrent and longitudinal effects of ethnic identity and experiences of discrimination on psychosocial adjustment of Navajo adolescents. *Developmental Psychology, 47*(2), 509–526. https://doi.org/10.1037/a0021061

Garcia, G. M., Hedwig, T., Hanson, B. L., Rivera, M., & Smith, C. A. (2019). The relationship between mixed race/ethnicity, developmental assets, and mental health among youth. *Journal of Racial and Ethnic Health Disparities, 6*, 77-85. https://doi.org/10.1007/s40615-018-0501-2

Garroutte, E. M., Goldberg, J., Beals, J., Herrell, R., Manson, S. M., & the AI-SUPERPFP Team (2003). Spirituality and attempted suicide among American Indians. *Social Science & Medicine, 56*(7), 1571-1579. https://doi.org/10.1016/s0277-9536(02)00157-0

Gloppen, K., McMorris, B., Gower, A., & Eisenberg, M. (2018). Associations between bullying involvement, protective factors, and mental health among American Indian youth. *American Journal of Orthopsychiatry, 88*(4), 413-421. http://doi.org/10.1037/ort0000284

Gonzálves, C., Kearney, C. A., Jiménez-Ayala, C. E., Sanmartín, R., Vicent, M., Inglés, C. J., & García-Fernández, J. M. (2018). Functional profiles of school refusal behavior and their relationship with depression, anxiety, and stress. *Psychiatry Research, 269*, 140-144. https://doi.org/10.1016/j.psychres.2018.08.069

Grossman, D. C., Milligan, B. C., & Deyo, R. A. (1991). Risk factors for suicide attempts among Navajo adolescents. *American Journal of Public Health, 81*(7), 870-874. https://doi.org/10.2105/ajph.81.7.870

Guillory, R. M., & Wolverton, M. (2008). It's about family: Native American student perspective in higher education. *The Journal of Higher Education, 79*(1), 58-87. https://doi.org/10.1080/00221546.2008.11772086

Hill, D. L. (2009). Relationship between sense of belonging as connectedness and suicide in American Indians. *Archives of Psychiatric Nursing, 23*(1), 65-74. https://doi.org/10.1016/j.apnu.2008.03.003

Hosker, D. K., Elkins, R. M., & Potter, M. P. (2019). Promoting mental health and wellness in youth through physical activity, nutrition, and sleep. *Child Adolescent Psychiatric Clinics of North America, 28*(2), 171-193. https://doi.org/10.1016/j.chc.2018.11.010

Hughes, D., Witherspoon, D., Rivas-Drake, D., & West-Bey, N. (2009). Received ethnic-racial socialization messages and youths' academic and behavioral outcomes: Examining the mediating role of ethnic identity and self-esteem. *Cultural Diversity and Ethnic Minority Psychology, 15*(2), 112-124. https://doi.org/10.1037/a0015509

Jacka, F. N., Kremer, P. J., Berk, M., de Silva-Sanigorski, A. M., Moodie, M., Leslie, E. R., Pasco, J. A., & Swinburn, B. A. (2011). A prospective study of diet quality and mental health in adolescents. *PloS ONE, 6*(9), e24805. https://doi.org/10.1371/journal.pone.0024805

Jaramillo, J., Mello, Z. R., Worrell, F. C. (2016). Ethnic identity, stereotype threat, and perceived discrimination among Native American adolescents. *Journal of Research on Adolescence, 26*(4), 619–1064. https://doi.org/ 10.1111/jora.12228

Jiang, C., Mitran, A., Miniño, A., & Ni, H. (2015). *Racial and gender disparities in suicide among young adults aged 18–24: United States, 2009–2013*. https://www.cdc.gov/nchs/data/hestat/suicide/racial_and_gender_2009_2013.htm

Johnson, T., & Tomren, H. (1999). Helplessness, hopelessness, and despair: Identifying the precursors to Indian youth suicide. *American Indian Culture and Research Journal*, *23*(3), 287-301. https://doi.org/10.17953/aicr.23.3.vq543623wv51h23t

Kang, Y., Smith, M., Ersan, O., & Rodriguez, M. C. (2018, April). *A pathway to resilience for students who experience trauma: A structural equation modeling approach* [Paper presentation]. The annual meeting of the American Educational Research Association, New York, NY. https://sites.google.com/view/mnydrg/research

Khalid, S., Williams, C. M., & Reynolds, S. A. (2017). Is there an association between diet and depression in children and adolescents? A systematic review. *British Journal of Nutrition, 116*(12), 2097-2108. https://doi.org/10.1017/S0007114516004359

Krumpal, I. (2013). Determinants of social desirability bias in sensitive surveys: a literature review. *Quality & Quantity*, 47, 2025–2047. https://doi.org/10.1007/s11135-011-9640-9

Kulis, S., Napoli, M., & Marsiglia, F. F. (2002). Ethnic pride, biculturalism, and drug use norms of urban American Indian adolescents. *Social Work Research, 26*(2), 101-112. https://doi.org/10.1093/swr/26.2.101

LaFromboise, T., Coleman, H. L. K., & Gerton, J. (1993). Psychological impact of biculturalism: Evidence and theory. *Psychological Bulletin, 114*(3), 395-412. http://dx.doi.org/10.1037/0033-2909.114.3.395

Langille, D. B., Asbridge, M., Cragg, A., & Rasic, D. (2015). Associations of school connectedness with adolescent suicidality: Gender differences and the role of risk of depression. *The Canadian Journal of Psychiatry, 60*(6), 258-267. https://doi.org/10.1177/070674371506000604

Larson, R. W. (2000). Toward a psychology of positive youth development. *American Psychologist*, *55*(1), 170-183. https://doi.org/10.1037/0003-066X.55.1.170

Latkin, C. A., Edwards, C., Davey-Rothwell, M. A., & Tobin, K. E. (2017). The relationship between social desirability bias and self-reports of health, substance use, and social network factors among urban substance users in Baltimore, Maryland. *Addictive Behaviors*, *73*, 133-136. https://doi.org/10.1016/j.addbeh.2017.05.005

Lerner, R. M., Lerner, J. V., Lewin-Bizan, S., Bowers, E. P., Boyd, M. J., Mueller, M. K., Schmid, K. L., & Napolitano, C. M. (2011). Positive youth development: Processes, programs, and problematics. *Journal of Youth Development, 6*(3), 41-64. https://doi.org/10.5195/JYD.2011.174

Linacre, J. M. (2019). *Winsteps* (Version 4.4.7) [Computer Software]. https://www.winsteps.com/

Mason, M. J., Schmidt, C., Abraham, A., Walker, L., & Tercyak, K. (2009). Adolescents' social environment and depression: Social networks, extracurricular activity, and family relationship influences. *Journal of Clinical Psychology in Medical Settings*, *16*, 346-354. https://doi.org/10.1007/s10880-009-9169-4

Masotti, P., Dennem, J., Hadani, S., Banuelos, K., King, J., Linton, J., Lockhart, B., & Patel, C. (2020). The Culture is Prevention Project: Measuring culture as a social determinant of mental health for Native/Indigenous peoples. *American Indian and Alaska Native Mental Health Research, 27*(1), 86-111. https://doi.org/10.5820/aian.2701.2020.86

Masters, G. N. (1982). A Rasch model for partial credit scoring. *Psychometrika, 47*(2), 149-174. https://doi.org/10.1007/BF02296272

McKinley, C. E., Figley, C. R., Woodward, S. M., Liddell, J. L., Billiot, S., Comby, N., & Sanders, S. (2019). Community-engaged and culturally relevant research to develop behavioral health interventions with American Indians and Alaska Natives. *American Indian and Alaska Native Mental Health Research, 26*(3), 79-103. https://dx.doi.org/10.5820/aian.2603.2019.79

Meltzer, H., Vostanis, P., Goodman, R., & Ford, T. (2007). Children's perceptions of neighbourhood trustworthiness and safety and their mental health. *Journal of Child Psychology and Psychiatry, 48*(12), 1208-1213. https://doi.org/10.1111/j.1469-7610.2007.01800.x

Messias, E., Kindrick, K., & Castro, J. (2014). School bullying, cyberbullying, or both: Correlates of teen suicidality in the 2011 CDC youth risk behavior survey. *Comprehensive Psychiatry, 55*(5), 1063-1068. https://doi.org/10.1016/j.comppsych.2014.02.005

Minnesota Department of Education. (2019). *Minnesota Student Survey*. http://education.state.mn.us/MDE/dse/health/mss

Minnesota Youth Development Research Group. (n.d.). *Research*. University of Minnesota. https://sites.google.com/view/mnydrg/research

Muthén, L. K., & Muthén, B. O. (2012). *Mplus*. (Version 7). [Software program]. https://www.statmodel.com/

National Association of Secondary School Principals. (2019). *Positional statement: Mental health.* https://files.nassp.org/archive/nassp/2019/01/NASSP18ADV-0005_PositionStatements__MentalHealth_P1a-1.pdf

National Institute of Mental Health (NIMH). (2019). *Mental health information*. https://www.nimh.nih.gov/health/statistics/mental-illness.shtml#part_155771

Okagaki, L., Helling, M. K., & Bingham, G. E. (2009). American Indian college students' ethnic identity and beliefs about education. *Journal of College Student Development, 50*(2), 157-176. https://doi.org/10.1353/csd.0.0060

O'Neil, A., Quirk, S. E., Housden, S., Brennan, S. L., Williams, L. J., Pasco, J. A., Berk, M., & Jacka, F. N. (2014). Relationship between diet and mental health in children and adolescents: A systematic review. *American Journal of Public Health, 104*(10), e31-e42. https://doi.org/10.2105/AJPH.2014.302110

Paruthi, S., Brooks, L. J., D'Ambrosia, C., Hall, W. A., Kotagal, S., Lloyd, R. M., Malow, B. A., Maski, K., Nichols, C., Quan, S. F., Rosen, C. L., Troester, M. M., & Wise, M. S. (2016). Recommended amount of sleep for pediatric populations: A consensus statement of the American academy of sleep medicine. *Journal of Clinical Sleep Medicine, 12*(6), 785-786. https://doi.org/10.5664/jcsm.5866

Peng, S. S., & Wright, D. (1994). Explanation of academic achievement of Asian American students. *The Journal of Educational Research, 87*(6), 346-352. https://doi.org/10.1080/00220671.1994.9941265

Rodriguez, M. C. (2017). *Technical report on developmental skills, supports, & challenges: 2013 & 2016 Minnesota Student Survey*. University of Minnesota. https://conservancy.umn.edu/handle/11299/195197

Substance Abuse and Mental Health Services Administration. (2017). *Results from the 2017 National Survey on Drug Use and Health: Detailed tables.* https://www.samhsa.gov/data/sites/default/files/cbhsq-reports/NSDUHDetailedTabs2017/NSDUHDetailedTabs2017.htm#tab1-1B

Substance Abuse and Mental Health Services Administration. (2019). *Risk and Protective Factors*. https://www.samhsa.gov/sites/default/files/20190718-samhsa-risk-protective-factors.pdf

Sanchez, D. T. (2010). How do forced-choice dilemmas affect multiracial people? The role of identity autonomy and public regard in depressive symptoms. *Journal of Applied Social Psychology, 40*(7), 1657-1677. https://doi.org/10.1111/j.1559-1816.2010.00634.x

Schraedley, P. K., Gotlib, I. H., & Hayward, C. (1999). Gender differences in correlates of depressive symptoms in adolescents. *Journal of Adolescent Health, 25*(2), 98-108. https://doi.org/10.1016/s1054-139x(99)00038-5

Search Institute. (2013). *Developmental Assets Profile: Technical summary*. http://www.search-institute.org/surveys/dap

Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*(1), 5-14. https://psycnet.apa.org/doi/10.1037/0003-066X.55.1.5

Serafini, K., Donovan, D. M., Wendt, D. C., Matsumiya, B., McCarty, C. A. (2017). A comparison of early adolescent behavioral health risks among urban American Indians/Alaska Natives and their peers. *American Indian and Alaska Native Mental Health Research, 24*(2), 1–17. https://psycnet.apa.org/doi/10.5820/aian.2402.2017.1

Shallowhorn, K. (2018, February 28). Letter: Mental health legislation will be a game changer for teens. *The Buffalo News.* https://buffalonews.com/opinion/letters/letter-mental-health-legislation-will-be-a-game-changer-for-teens/article_857ce6bb-8f4c-52b7-bd22-fb9f07c77443.html

Shane, A. L., Apok, C. R., Doyle, M. J., Hiratsuka, V. Y., Dillard, D. A., & Caindec, K. (2018). Future directions in disseminating research findings to urban Alaska Native people. *American Indian and Alaska Native Mental Health Research, 25*(1), 96-109. https://dx.doi.org/10.5820/aian.2501.2018.96

Sherman, A. M., Skrzypek, A., Bell, R., Tatum, C., & Paskett, E. D. (2011). The contribution of social support and social strain to depressive symptoms in African American, Native American, and European American women. *Journal of Social and Personal Relationships, 28*(8), 1104-1129. https://doi.org/10.1177/0265407511406895

Shih, M., & Sanchez, D. T. (2005). Perspectives and research on the positive and negative implications of having multiple racial identities. *Psychological Bulletin, 131*(4), 569-591. https://doi.org/10.1037/0033-2909.131.4.569

Shochet, I. M., Dadds, M. R., Ham, D., & Montague, R. (2006). School connectedness is an underemphasized parameter in adolescent mental health: results of a community prediction study. *Journal of Clinical Child & Adolescent Psychology, 35*(2), 170-179. https://doi.org/10.1207/s15374424jccp3502_1

Silmere, H., & Stiffman, A. R. (2006). Factors associated with successful functioning in American Indian youths. *American Indian and Alaska Native Mental Health Research, 13,* 23-47. https://doi.org/10.5820/aian.1303.2006.23

Smith, T. J., & McKenna, C. M. (2013). A comparison of logistic regression pseudo R^2 indices. *General Linear Model Journal, 39*(2), 17-26. http://www.glmj.org/archives/GLMJ_2014v39n2.html

Stumblingbear-Riddle, G., & Romans, J. S. C. (2012). Resilience among urban American Indian adolescents: Exploration into the role of culture, self-esteem, subjective well-being, and social support. *American Indian and Alaska Native Mental Health Research, 19,* 1-19. https://doi.org/10.5820/aian.1902.2012.1

Szumilas, M. (2010). Explaining odds ratios. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 19(3),* 227-229. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2938757/

Tarokh, L., Saletin, J. M., & Carskadon, M. A. (2016). Sleep in adolescence: Physiology, cognition and mental health. *Neuroscience and Biobehavioral Reviews, 70*, 182–188. https://doi.org/10.1016/j.neubiorev.2016.08.008

Udry, J. R., Li, R. M., & Hendrickson-Smith, J. (2003). Health and behavior risks of adolescents with mixed-race identity. *American Journal of Public Health, 93*(11), 1865-1870. https://doi.org/10.2105/ajph.93.11.1865

Van Boekel, M., Bulut O., Stanke, L., Palma Zamora, J. R., Jang, Y., Kang, Y., & Nickodem, K. (2016). Effects of participation in school sports on academic and social functioning. *Journal of Applied Developmental Psychology, 46*, 31-40. https://doi.org/10.1016/j.appdev.2016.05.002

Wahlstrom, K. L. (2016). Later start time for teens improves grades, mood, and safety. *Phi Delta Kappan, 98*(4), 8-14. https://doi.org/10.1177/0031721716681770

Wall, T. L., Garcia-Andrade, C., Wong, V., Lau, P., & Ehlers, C. L. (2000). Parental history of alcoholism and problem behaviors in Native-American children and adolescents. *Alcoholism: Clinical and Experimental Research*, *24*(1), 30-34. https://doi.org/10.1097/00000374-200001000-00005

Werner, E. (2012). Risk, resilience, and recovery. *Reclaiming Children and Youth, 21*(1), 18-22. http://reclaimingjournal.com/issues-46/

Whitbeck, L. B., Hoyt, D. R., McMorris, B. J., Chen, X., & Stubben, J. D. (2001). Perceived discrimination and early substance abuse among American Indian children. *Journal of Health and Social Behavior*, *42*(4), 405-424. https://doi.org/10.2307/3090187

Whitbeck, L. B., Walls, M. L., Johnson, K. D., Morrisseau, A. D., & McDougall, C. M. (2009). Depressed affect and historical loss among North American indigenous adolescents. *American Indian and Alaska Native Mental Health Research, 16*(3), 16-41. https://doi.org/10.5820/aian.1603.2009.16

Yoshikawa, H., Aber, J. L., & Beardslee,W. R. (2012). The effects of poverty on the mental, emotional, and behavioral health of children and youth: Implications for prevention. *American Psychologist, 67*(4), 272–284. https://doi.org/10.1037/a0028015

Yu, M., Stiffman, A. R., & Freedenthal, S. (2005). Factors affecting American Indian adolescent tobacco use. *Addictive Behaviors, 30*(5), 889-904. https://doi.org/10.1016/j.addbeh.2004.08.029

Zhu, X., Haegele, J. A., & Healy, S. (2019). Movement and mental health: behavioral correlates of anxiety and depression among children of 6-17 years old in the U.S. *Mental Health and Physical Activity, 16*, 60-65. https://doi.org/10.1016/j.mhpa.2019.04.002

ACKNOWLEDGEMENTS

This work was completed with the support of the Minnesota Youth Development Group (https://sites.google.com/view/mnydrg) and the Campbell Leadership Chair in Education and Human Development (held by Dr. Rodriguez) at the University of Minnesota.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interests.

AUTHOR INFORMATION

Ozge Ersan is a PhD candidate majoring in Quantitative Methods in Education, in the Department of Educational Psychology at the University of Minnesota in Minneapolis, MN. Her research area is educational measurement and evaluation.

Dr. Michael C. Rodriguez is a Professor of Quantitative Methods in Education, in the Department of Educational Psychology at the University of Minnesota in Minneapolis, MN. His research areas include educational measurement, with a focus on item-writing, accessible measurement, and educational equity.

APPENDIX

Table A1

Study Variables and Associated Items in MSS 2019

Name of variable	Items used to create the variable	Variable construction method
Mental Distress	• Do you have any long-term mental health, behavioral or emotional problems? Long-term means lasting 6 months or more. • Have you ever been treated for a mental health, emotional or behavioral problem (during the last year or more than a year ago)? • During the last 12 months, how many times did you do something to purposely hurt or injure yourself without wanting to die, such as cutting, burning or bruising yourself on purpose? * not Y/N • Have you ever seriously considered attempting suicide (during the last year or more than a year ago)? • Have you ever actually attempted suicide (during the last year or more than a year ago)? Choices: *Yes, No*	dichotomous variable 1=Yes, if *Yes* item choice is selected at least for one question; 0=No, otherwise.
Trauma	• Do you live with anyone who drinks too much alcohol? • Do you live with anyone who uses illegal drugs or abuses prescription drugs? • Does a parent or other adult in your home regularly swear at you, insult you or put you down? • Has a parent or other adult in your household ever hit, beat, kicked or physically hurt you in any way? • Have your parents or other adults in your home ever slapped, hit, kicked, punched or beat each other up? • Has any older or stronger member of your family ever touched you or had you touch them sexually? • Have any of your parents or guardians ever been in jail or prison? • During the past 12 months, have you stayed in a shelter, somewhere not intended as a place to live, or someone else's home because you had no other place to stay (on your own without any adult family members or with an adult family member)? Choices: *Yes, No*	dichotomous variable 1=Yes, if *Yes* item choice is selected at least for one question; 0=No, otherwise.

Name of variable	Items used to create the variable	Variable construction method
Being bullied (victim)	During the last 30 days, how often have other students harassed or bullied you for any of the following reasons? • Your race, ethnicity or national origin • Your religion • Your gender • Because you are gay or lesbian or because someone thought you were • A physical or mental disability • Your weight or physical appearance During the last 30 days, how often have you been bullied through e-mail, chat rooms, instant messaging, websites or texting? During the last 30 days, how often have other students at school… • pushed, shoved, slapped, hit or kicked you when they weren't kidding around? • threatened to beat you up? • spread mean rumors or lies about you? • made sexual jokes, comments or gestures towards you? • excluded you from friends, other students or activities? Choices: *never, once or twice, about once a week, several times a week, every day*	continuous variable created by partial credit Rasch model
Family/ community support	• Can you talk to your mother about problems you are having? Choices: *yes, most of the time; yes, some of the time; no, not very often; no, not at all; my mother is not around* • Your parents care about you. • Other adult relatives care about you. • Friends care about you. • Adults in your community care about you. Choices: *not at all, a little, some, quite a bit, very much*	continuous variable created by partial credit Rasch model

Name of variable	Items used to create the variable	Variable construction method
Empowerment	• I feel safe at school. • I feel safe in my neighborhood. • I feel safe at home. Choices: *strongly disagree, disagree, agree, strongly agree* • I feel valued and appreciated by others. • I am included in family tasks and decisions. • I am given useful roles and responsibilities. Choices: *not at all or rarely, somewhat or sometimes, very of often, extremely or almost always*	continuous variable created by partial credit Rasch model
Teacher/ school support	• Overall, adults at my school treat students fairly. • Adults at my school listen to the students. • The school rules are fair. • At my school, teachers care about students. • Most teachers at my school are interested in me as a person. • Teachers/other adults at school care about you. Choices: *strongly disagree, disagree, agree, strongly agree*	continuous variable created by partial credit Rasch model
OST activity participation (at least 3 times/week)	During a typical week, how often do you participate in each of the following activities outside of the regular school day • Sports teams, such as park and rec teams, school teams, in-house teams or traveling teams • School sponsored activities or clubs that are not sports, such as drama, music, chess or science club • Leadership activities such as student government, youth councils or committees • Other community clubs such as 4-H, Scouts, Y-clubs or Community Ed? • Artistic lessons, such as music or dance • Physical activity lessons, such as tennis or karate Choices: *0 days, 1 day, 2 days, 3 to 4 days, 5 or more days*	dichotomous variable 1=Yes, if student participates in any activities a total of at least three times a week; 0=No, otherwise

Table A2
Intercorrelations Among the Study Variables

	MD	age	low SES	sex	race	tribe	trauma	BD	subs. use	skip school	FCS	EM	TSS	OST activ.	diet
age	0.05	1.00													
low SES	0.20	-0.08	1.00												
sex	0.36	-0.02	0.08	1.00											
race	0.06	-0.02	-0.09	0.10	1.00										
tribe	0.01	0.04	0.19	0.06	-0.23	1.00									
trauma	0.48	0.02	0.35	0.15	-0.05	0.13	1.00								
BD	0.45	-0.11	0.08	0.20	0.06	-0.03	0.31	1.00							
subs. use	0.47	0.16	0.07	0.15	0.04	0.07	0.46	0.31	1.00						
skip school	0.16	0.04	0.14	0.10	-0.04	0.13	0.16	0.10	0.20	1.00					
FCS	-0.44	-0.02	-0.17	-0.17	-0.03	-0.05	-0.42	-0.32	-0.31	-0.12	1.00				
EM	-0.48	0.00	-0.18	-0.22	-0.02	-0.03	-0.41	-0.36	-0.32	-0.14	0.65	1.00			
TSS	-0.30	-0.01	-0.06	-0.19	-0.02	-0.07	-0.29	-0.31	-0.30	-0.18	0.54	0.51	1.00		
OST activ.	-0.19	-0.04	-0.24	0.00	0.04	-0.06	-0.20	0.06	-0.09	-0.12	0.24	0.23	0.13	1.00	
diet	-0.09	-0.02	-0.15	0.02	0.01	-0.08	-0.16	-0.01	-0.09	-0.06	0.20	0.23	0.14	0.25	1.00
sleep	-0.30	-0.16	-0.05	-0.15	-0.03	-0.04	-0.26	-0.16	-0.30	-0.18	0.34	0.35	0.27	0.12	0.16