PERCEIVED RACIAL/ETHNIC DISCRIMINATION AND DEPRESSIVE SYMPTOMS AMONG ADOLESCENTS LIVING IN THE CHEROKEE NATION

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Abstract: The objective of this study was to examine the longitudinal relationship between perceived racial/ethnic discrimination and depressive symptoms among adolescents living in the Cherokee Nation, as well as the potential moderating roles of race and social support. Self-reported survey data were analyzed from a sample of high school students (n = 1,622) who identified as American Indian only, American Indian and White, and White only. Compared to students who reported no discrimination on the basis of race, those who reported ever having experienced discrimination scored, on average, 1.62 units higher on the depressive symptoms scale six months later (p < .0001, 95% CI: 0.90, 2.33), while adjusting for age, race, gender, baseline depressive symptoms, enrollment in a free/reduced-price lunch program, and social support. Discrimination intensity did not significantly predict depressive symptoms among those reporting some frequency of discrimination. Race and social support did not modify either effect. These findings may inform development of interventions to promote mental health among American Indian adolescents.

INTRODUCTION

American Indian adolescents are at higher risk for mental health problems than other racial/ethnic groups in the United States (Leavitt et al., 2018). Over the past two decades, the suicide rate among American Indian and Alaska Native (AI/AN) youth and young adults increased significantly, from 20 to 34 per 100,000 among males and from 5 to 11 among females (Curtin & Hedegaard, 2019). The suicide rate among AI/AN youth is 1.56 times higher than the national average of same-aged youth; in contrast to national trends where suicide rates gradually increase and level off with age, suicide rates peak among AI/AN during adolescence and young adulthood (Centers for Disease Control and Prevention, 2021). These differences in the onset of peak suicide rates across groups may be attributable to an array of risk factors including social determinants of health such as rurality, poverty, historical trauma, and substance use, among others (Garcia, 2020; Leavitt et al., 2018; National Indian Council on Aging, 2019; Sarche & Spicer, 2008; Suicide Prevention Resource Center, 2020). A growing body of literature on adverse childhood experiences and major life events shows that exposure to adversity throughout the life course increases the risk of mental health problems among AI/AN populations (Brockie et al., 2015; Munnelly & Hishinuma, 2020; Roh et al., 2015). More research is being done to understand how racism, including discrimination, stigma, and historical trauma, can be better addressed to inform culturally relevant prevention and intervention strategies for indigenous youth (Maguire-Jack et al., 2020; Munnelly & Hishinuma, 2020).

Racial/ethnic discrimination can be broadly conceptualized as unfair treatment on the basis of one's race or ethnicity (Vines et al., 2017). Racial/ethnic discrimination has increasingly been studied as a social determinant of health and mental health specifically (Cave et al., 2020; Priest et al., 2013; Vines et al., 2017). A systematic review of adolescent health found significant positive associations in 76% of included studies between reported discrimination and adverse mental health outcomes such as depression and anxiety (Priest et al., 2013). However, most studies were cross-sectional and reported primarily on adolescents who identified as African American, Asian, or Latino/a/x (Priest et al., 2013). More recently, a systematic review of longitudinal studies revealed the predictive strength of racial discrimination on later mental health outcomes among adolescents (Cave et al., 2020). The need to understand this exposure-outcome relationship is particularly pressing for understudied, underserved groups such as AI/AN youth who experience the brunt end of disparities in mental health, substance use, and exposure to the criminal justice system in the United States. These disparities in health and well-being may be partially attributable to racial/ethnic discrimination rooted in historical trauma and colonization (Garcia, 2020; Skewes & Blume, 2019; Komro, 2018; Suicide Prevention Resource Center, 2020; Swaim & Stanley, 2018).

To scaffold emerging evidence on discrimination and mental health with theory, Vines and colleagues developed a Framework of Discrimination Stress, Coping and Mental Health (2017). According to the framework, perceived racial/ethnic discrimination is conceptualized as a chronic stressor whose persistence and unpredictability depletes an individual's protective psychological resources over time (Vines et al., 2017). In turn, risky behaviors (e.g., substance use and externalizing problems) in conjunction with diminished emotional control are more likely, thereby increasing the likelihood of poor mental health (Vines et al., 2017). Since poor mental health can presuppose and exacerbate risky behaviors, adverse cyclical patterns may result. Other contextual factors, such as social support or race/ethnicity, may affect an individual's perception of discrimination severity and ultimately the impact of discrimination on mental health (Vines et al., 2017).

Much remains unknown about AI adolescent mental health, longitudinal relationships between adversity exposures and well-being outcomes, and the role of discrimination (Cave et al., 2020). A significant body of previous research on racial/ethnic discrimination and depression has focused on other racial/ethnic and sociodemographic groups using cross-sectional study designs. Prior work has examined depressive symptoms and substance use among Cherokee adolescents, but this work did not look at the role played by discrimination exposure (Komro et al., 2016; Garrett et al., 2017). Further, social support has been shown to protect against depressive symptoms in a sample of older AI adults (Roh et al., 2015), which suggests a potential buffering effect of social relationships. Empirical support for the Framework of Discrimination Stress, Coping and Mental Health (2017) among AI adolescents may explain the relationship between exposure and outcome to better inform the prevention and treatment of mental health among AI youth (Montag et al., 2015).

The present study aims to address gaps in empirical support for the Vines et al. framework (2017) for AI youth by studying the longitudinal association between perceived racial/ethnic discrimination and depressive symptoms among adolescents in the Cherokee Nation. Given the longitudinal timing of exposure and outcome, we hypothesized that higher reported discrimination frequency and intensity would positively predict depressive symptoms among high school students. In an effort to identify potential intervention targets to better support adolescents, we also examined moderation by racial/ethnic group and social support.

METHODS

Data Source and Participants

Data come from a cluster randomized trial to prevent alcohol and substance use among adolescents living within the Cherokee Nation tribal jurisdiction of northeastern Oklahoma, which currently comprises 14 counties. The trial design and data collection methods are described in detail elsewhere (Komro et al., 2015), but the multi-level intervention that was tested in the trial consisted of 1) one-on-one coaching of students via a program called Connect, in conjunction with

2) a community-wide initiative to reduce substance use access among adolescents. Sample characteristics come from the baseline, pre-intervention period during which waves of self-reported data were collected from students (*n* = 1,622) via survey in four high schools located in rural communities within the Cherokee Nation. Included in the present analyses are data collected at two of these pre-intervention timepoints: T1 (November – December of 2011) and T2 (April – May of 2012). Eighty-eight percent of the sample was between the ages of 15-18 years old. Students self-identified as American Indian only (26%), American Indian and White (21%), and White only (53%). The sample was approximately 50% female and 45% low-income as indicated by self-reported enrollment in a free or reduced-price lunch program at school. Enrollment in a free or reduced-price lunch program at school was used as an indicator of low income instead of asking students to report on their household income without sufficient knowledge. Other racial/ethnic groups were not included in analyses due to small cell counts.

Measures

Perceived Racial/Ethnic Discrimination

Perceived racial/ethnic discrimination was self-reported in terms of frequency and intensity using two items from the National Youth Risk Behavior Survey (Centers for Disease Control and Prevention, 2010). Discrimination frequency was assessed with the question, “How often have you experienced any kind of discrimination due to your race/ethnicity?” Students selected from the following response options: “never,” “hardly ever,” “a few times a year,” “monthly,” and “daily.” Due to small cell counts at higher frequencies of discrimination, categories were collapsed for regression analyses to yield a binary discrimination frequency variable for “ever” versus “never” having experienced discrimination. Discrimination intensity was assessed with the question, “How would you describe the discrimination you have experienced?” and response options were reported on a 4-point Likert-type scale where 1 = “very disturbing,” 2 = “somewhat disturbing,” 3 = “not very disturbing,” and 4 = “I have not experienced any kind of discrimination due to my race/ethnicity.” For regressions, the analytic subsample included those who reported ever having experienced discrimination (i.e., excluded those who responded, “I have never experienced any kind of discrimination due to my race/ethnicity”). Due to small cell counts at higher intensities of discrimination, categories were collapsed for regression analyses to yield a binary discrimination intensity variable for “more intense” (“very disturbing” combined with “somewhat disturbing”) versus “less intense” (“not very disturbing”).

Depressive Symptoms

Depressive symptoms were assessed using a 6-item scale validated in a clinical sample of adolescents (Kandel & Davies, 1982). Each item asked respondents to report how often in the past 30 days they were bothered or troubled by “feeling too tired to do things”; “going to sleep or staying asleep”; “feeling unhappy, sad, or depressed”; “feeling hopeless about the future”; and “feeling nervous or tense.” Response options were on a 3-point scale where 1 = “not at all,” 2 = “somewhat,” and 3 = “very often.” Consistent with scoring rules for this scale, item scores were summed, divided by 6, and multiplied by 10 to yield a range of possible scores on the depression scale from 10 to 30 (Kandel & Davies, 1982). Clinical cutoffs for depression risk categories were: < 18 is low risk, 18-23 is moderate risk, and ≥ 23 is high risk (Kandel & Davies, 1982). Cronbach’s alpha for the depression scale among this sample was 0.84 at T1 and 0.89 at T2.

Social Support

Social support was assessed using a 6-item scale that asked about the people in a person’s life (Oklahoma Department of Mental Health and Substance Abuse Services, 2010). Respondents used a 4-point Likert-type scale to indicate the extent to which they agreed with statements about availability of social support from various sources. Example items include, “There is an adult in my life, such as a parent, relative, teacher or neighbor, who I can ask for help if I have a personal problem” and “There are people in my town who encourage me to do my best.” Respondents rated items as 1 = “definitely not true,” 2 = “mostly not true,” 3 = “mostly true,” or 4 = “definitely true.” Item scores were summed to yield a range of possible scores on the social support scale from 6 to 24. Cronbach’s alpha for the social support scale among this sample was 0.82.

Sociodemographic Characteristics

Age, race, gender, and a proxy for socioeconomic status were also collected. On race, participants reported whether they identified as American Indian (yes/no) and White (yes/no). The race variable includes the resulting three categories for those who identified as American Indian (AI) only, American Indian and White (AI/White), and White only. Gender was assessed with a binary response option (female/male). Socioeconomic status was represented by the student’s enrollment in a free or reduced-price lunch program.

Analyses

Univariate analyses were performed using SAS 9.4 on data available for participants at both T1 and T2. Stratified by race (AI only, AI/White, White only), frequencies and percentages are reported for categorical demographic variables (age, gender, enrollment in a free or reduced-price lunch program). Mean scores with standard deviations are reported for continuous predictors (perceived racial/ethnic discrimination, social support, depressive symptoms at T1) and the outcome of interest (depressive symptoms at T2). Bivariate analyses were performed using unadjusted linear regressions to predict depressive symptoms (T2) based on discrimination frequency and intensity separately. Adjusted linear regression models were performed to predict depressive symptoms while adjusting for age, race, gender, enrollment in a free or reduced-price lunch program, depressive symptoms (T1), and social support. Additional models were assessed for moderation of the main relationships between discrimination and depressive symptoms by race and social support. To handle missingness, complete case analysis was used. As a sensitivity analysis, multiple imputations (m = 20) were performed to address missingness across time points using PROC MI in SAS 9.4. Linear regressions were performed for each imputed data set then pooled to estimate standard errors using parameter estimates and covariance matrices for each imputation (IDRE Statistical Consulting Group, 2021).

RESULTS

Results of the univariate analyses are presented for the overall sample as well as stratified by race in Table 1. Twenty percent of students who responded to the discrimination frequency item ($n = 316/1573$) reported ever having experienced discrimination. By race, the frequencies of adolescents reporting ever having experienced discrimination were 23.15% (AI), 22.39% (AI/White), and 17.72% (White). Of those who experienced discrimination, 44.03% ($n = 177/402$) described the discrimination experiences as somewhat or very disturbing. By race, among those who experienced discrimination, the frequencies of adolescents reporting somewhat or very disturbing discrimination experiences were 53.13% (AI), 43.59% (AI/White), and 38.27% (White).

Unadjusted linear regressions were performed to observe the effects of discrimination frequency and intensity on depressive symptoms without covariates. Compared to students who reported never having experienced discrimination, those who reported ever having experienced discrimination scored, on average, 2.62 units higher on the depressive symptoms scale six months later (95% CI: 1.82-3.43, $p<.0001$). This relationship was statistically significant for each racial/ethnic group (AI, $p = 0.005$; AI/White, $p < .0001$; White, $p < .0001$). Among the subsample of individuals who reported experiencing discrimination, there were no statistically significant differences in depressive symptoms based on discrimination intensity, overall or by racial/ethnic group ($p > .05$ for overall and for each racial/ethnic group). Adjusted linear regressions determined that neither race (AI/White, $p = 0.772$; White, $p = 0.346$) nor social support ($p = 0.519$) moderated the relationship between discrimination frequency and depressive symptoms.

Table 1

Sample characteristics of high school students for demographic, exposure, and outcome variables

	Overall (*n* = 1,622)		**AI (*n* = 422)**		**AI/White (*n* = 338)**		**White (*n* = 862)**	
	n or M	**% or SD**	**n or M**	**% or SD**	**n or M**	**% or SD**	**n or M**	**% or SD**
Age								
≥19	14	0.86	5	1.19	1	0.30	8	0.93
18	195	12.03	57	13.54	35	10.36	103	11.95
17	392	24.18	107	25.42	83	24.56	202	23.43
16	414	25.54	103	24.47	87	25.74	224	25.99
15	430	26.53	118	28.03	94	27.81	218	25.29
≤14	176	10.86	31	7.36	38	11.24	107	12.41
Gender								
Male	816	50.31	207	49.05	175	51.78	434	50.35
Female	806	49.69	215	50.95	163	48.22	428	49.65
Free or reduced-price lunch								
Yes	642	44.71	183	49.73	130	44.52	329	42.40
No	794	55.29	185	50.27	162	55.48	447	57.60
Discrimination frequency								
None	1257	79.91	312	76.85	253	77.61	692	82.28
Hardly ever	213	13.54	57	14.04	48	14.72	108	12.84
A few times a year	76	4.83	30	7.39	20	6.13	26	3.09
Monthly	14	0.89	3	0.74	2	0.61	9	1.07
Daily	13	0.83	4	0.99	3	0.92	6	0.71
Discrimination intensity								
Not applicable	1149	74.08	270	67.84	246	75.93	633	76.36
Not very disturbing	225	14.51	60	15.08	44	13.58	121	14.60
Somewhat disturbing	115	7.41	40	10.05	28	8.64	47	5.67
Very disturbing	62	4.00	28	7.04	6	1.85	28	3.38
Social support	18.33	3.86	18.36	3.84	18.05	3.61	18.42	3.97
Depressive symptoms	17.38	5.55	17.34	5.72	17.51	5.23	17.36	5.59
Depressive symptoms (T2)	16.56	5.92	16.45	6.10	16.87	5.85	16.49	5.87

n = number of students; M = mean; T2 indicates data collected at the second time point (April – May of 2012). Missing data where overall n ≠ 1622. Percentages were calculated based on available data for each race on each variable listed. Social support was assessed using a 6-item scale that asked about the people in a person's life. Possible scores range from 6 to 24 (Oklahoma Department of Mental Health and Substance Abuse Services, 2010). Depressive symptoms were assessed using a 6-item scale validated in a clinical sample of adolescents. Possible scores range from 10 to 30, where <18 is low risk, 18-23 is moderate risk, and ≥23 is high risk (Kandel & Davies, 1982).

Adjusted regression models were performed on the overall sample. Tables 2a and 2b show results of the adjusted linear regression models predicting depressive symptoms based on discrimination frequency (Model A) and discrimination intensity (Model B), respectively. When adjusting for age, race, gender, enrollment in a free or reduced-price lunch program, T1 depressive symptoms, and social support, discrimination frequency was found to significantly predict depressive symptoms six months later (Model A). Compared to students who reported never having experienced discrimination, those who reported ever having experienced discrimination scored, on average, 1.62 units higher on the depressive symptoms scale six months later ($p<.0001$, 95% CI: 0.90, 2.33), while accounting for potential confounders. Sensitivity analyses with multiple imputations resulted in a small attenuation of this effect (B = 1.27, $p < .0001$, 95% CI: 0.64, 1.89). Yet, discrimination intensity did not significantly predict depressive symptoms in adjusted analyses (Model B). These results remained robust in sensitivity analyses ($p = .672$).

Table 2a

Adjusted linear regression model predicting depressive symptoms (T2) based on discrimination frequency

Model (n)	**Variable**	**B**	**SE**	***p***	**95% CI**
A (1118)	Discrimination frequency: ever	1.62	0.37	<.0001	0.90-2.33
	Social support	-0.07	0.04	0.056	-0.15-0.00
	Age	0.06	0.12	0.603	-0.17-0.29
	Female	0.69	0.29	0.018	0.12-1.26
	Free/reduced-price lunch	-0.19	0.29	0.492	-0.77-0.37
	Depressive symptoms	0.61	0.03	<.0001	0.56-0.67
	AI/White	0.28	0.42	0.506	-0.55-1.11
	White	0.25	0.34	0.468	-0.42-0.93

T2 indicates depressive symptoms data collected at the second time point (April—May 2012).
All predictor variables were collected at T1 (November—December 2011). n = number of students (less than n reported in Table 1 due to missingness on covariates); B = beta; SE = standard error; CI = confidence interval; AI = American Indian. Model A (full sample) predicted T2 (April—May 2012) depressive symptoms based on discrimination frequency (ever vs. never) while adjusting for covariates. AI is the referent group.

Table 2b

Adjusted linear regression model predicting depressive symptoms (T2) based on discrimination intensity

Model (n)	Variable	B	SE	*p*	95% CI
B (262)	Discrimination intensity: more	0.26	0.66	0.700	-1.03-1.55
	Social support	-0.12	0.09	0.182	-0.29-0.05
	Age	-0.51	0.29	0.075	-1.07-0.05
	Female	1.54	0.69	0.023	0.21-2.86
	Free/reduced-price lunch	0.23	0.67	0.732	-1.09-1.55
	Depressive symptoms	0.58	0.06	<.0001	0.46-0.70
	AI/White	0.84	0.92	0.363	-0.96-2.64
	White	0.57	0.75	0.449	-0.91-2.05

T2 indicates depressive symptoms data collected at the second time point (April—May 2012).

All predictor variables were collected at T1 (November—December 2011). n = number of students (less than n reported in Table 1 due to missingness on covariates); B = beta; SE = standard error; CI = confidence interval; AI = American Indian.

Model B (subsample of individuals who reported ever having experienced discrimination) predicted T2 depressive symptoms based on discrimination intensity (more vs. less) while adjusting for covariates. AI is the referent group for both models.

DISCUSSION

Previous research has revealed associations between discrimination and mental health outcomes in young people, and the Framework of Discrimination Stress, Coping and Mental Health by Vines and colleagues describes the theorized relationship between discrimination exposure and mental health outcomes (Cave et al., 2020; Priest et al., 2013; Vines et al., 2017). As research on discrimination and depressive symptoms among AI adolescents and others living on reservations continues to grow, the mental health of these populations persists as a public health concern (Cave et al., 2020; Curtin & Hedegaard, 2019; Priest et al., 2013). The aim of the current study was to begin to fill this gap by better understanding the longitudinal role of perceived racial/ethnic discrimination among adolescents living within the Cherokee Nation reservation as it pertains to later depressive symptoms.

The significant relationship between discrimination frequency and depressive symptoms observed here aligns with the Framework of Discrimination Stress, Coping and Mental Health (Vines et al., 2017), as hypothesized. Students who reported experiences of discrimination at T1 reported significantly higher levels of depressive symptoms six months later, which lends evidence to the temporality of exposure and outcome. However, contrary to expectations, neither race nor social support moderated this association. Social support has previously been found to buffer the detrimental effects of adversity on mental health (Roh et al., 2015), so it is possible that the measure used in this study was not capturing the most important facets of social support for adolescents from the target population. Rather than query *who* provides support as the current measure does, it may be worth examining *what types of support* and *with what intensity and reliability* this social support is provided by others and received by adolescents. Future work is necessary to understand moderators (e.g., cultural-ethnic identities and internalizations, including positive private regard) as potential intervention targets to improve mental health and well-being of AI adolescents.

The current study has several strengths. First, the temporality afforded by longitudinal analysis of exposure and outcome contributes greater confidence in the possibility of a causal relationship between discrimination and later depressive symptoms than cross-sectional research. Additionally, the sample size was large, which is especially important given the dearth of literature on discrimination and depressive symptoms among AI adolescents. Finally, the purpose and implementation of the original trial was conceived in collaboration with the Cherokee Nation and is rooted in community-based partnership with practical, need-based questions at the center of our analyses.

Despite these strengths, this study is not without limitations. First, although our discrimination measure captured both frequency and intensity, each was assessed with a single item. Importantly, measures that capture timing or duration of discrimination may be more helpful moving forward as we assess exposure and outcome using a life-course perspective (Cave et al., 2020). Knowledge of when and why discrimination effects change in mental health later on could assist intervention efforts in implementation timing, duration, and content. Use of well-established discrimination measures, including those previously validated among AI samples, would strengthen future research in this area (Blair et al., 2021; Gonzales et al., 2016; Krieger, 2014; Williams et al., 1997). Additionally, small cell counts at higher levels of discrimination necessitated collapsing of categories for the sake of power, which diminished acuity of the discrimination measures. The measure of depressive symptoms similarly may not adequately capture mental suffering of AI youth, since measures of depressive symptoms have been shown to work differently in AI/AN samples relative to non-AI/AN samples (Barbosa-Leiker et al., 2021). Use of self-reported data introduces the possibility of social desirability bias and recall bias of past exposures. Although the study's findings contribute to growing evidence behind the Framework of Discrimination Stress, Coping and Mental Health (Vines et al., 2017), contextual, historical, and sociological factors are not sufficiently addressed using this theoretical basis alone to effectively center Indigenous perspectives. As noted, as a common weakness in this type of research (Kirkinis et al., 2018), we did not measure or control for non-race-based trauma. Future studies could measure and account for cultural identity (e.g., centrality of ethnic-racial identity, private regard) and collective, intergenerational, and historical traumas that were not explored in this study.

In the face of concerning disparities in mental health outcomes, AI adolescents are not receiving needed attention (Brockie et al., 2015; Leavitt et al., 2018; National Indian Council on Aging, 2019), and these findings add to the evidence base that could inform future prevention and intervention strategies in timing, duration, and tailored content to prevent or buffer discrimination effects on mental health. For instance, as part of the ongoing community trial, Connect was designed as a one-on-one intervention between student and coach to foster mental health and prevent substance use (Komro et al., 2017). Understanding moderators of the relation between discrimination and depressive symptoms would be helpful to tailor Connect and similar programs to meet students' unique needs, using insight into understanding risk and protective factors as intervention targets. Future directions in this area could include testing the pathways of the guiding theoretical framework that include externalizing behavior patterns (e.g., risky behavior such as alcohol or other drug use) as mediators of the relation between discrimination and depressive symptoms, or the role of internalizing psychological responses such as cultural identity. Future work should also consider critical contextual influences (e.g., historical trauma and community factors) as social determinants of mental health among adolescents from understudied, underserved groups relative to Western populations who are typically at the focus of this type of research. Protective factors at the individual level (e.g., self-compassion, mindfulness) and community levels (e.g., cultural strengths, connectedness, engagement in tribal activities) may be powerful buffers on the pathway from discrimination to depressive symptoms and should be explored to inform tailored, culturally relevant strategies for mental health promotion among AI youth (Dolezal et al., 2021; Masotti et al., 2020).

In conclusion, this study adds to the evidence base behind discrimination as predictive of later depressive symptoms among adolescents from the Cherokee Nation by examining the longitudinal relationship between exposure and outcome. Adolescents from the Cherokee Nation comprise a population that may benefit from tailored support and resources to improve health outcomes.

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CONFLICT OF INTEREST

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