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Historical Trauma and Substance Use among Native Hawaiian College Students

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Abstract

Objectives—To test the relationships among historical trauma, perceived discrimination, and substance use (cigarette, alcohol, and marijuana use) among Native Hawaiians.

Methods—Cross sectional self-report data were collected online from 128 Native Hawaiian community college students (M age = 27.5; SD = 9.5; 65% Women). Hypotheses were tested using structural equation modeling.

Results—Historical trauma had 2 paths to substance use: an indirect path to higher substance use through higher perceived discrimination and a direct path to lower substance use.

Conclusions—Thoughts, knowledge, or experience associated with historical trauma may enhance substance use behavior via increased perceived discrimination and may also be protective against substance use, possibly via increased pride in one's cultural heritage. This research has implications for historical trauma, discrimination, and substance use research concerning Native Hawaiians.

Keywords

historical trauma; native Hawaiian; substance use

Native Hawaiians and other Pacific Islanders represent one of the fastest growing racial categories in the US and more than half a million individuals in the country currently identify themselves as full or part Native Hawaiian.¹ Native Hawaiians are indigenous to the Hawaiian islands. Commonly subsumed under a broad category of “Asian/Pacific Islanders,” Native Hawaiians are often overlooked in research as a separate ethnic entity and, as a result, have been severely understudied. This is problematic because Native Hawaiians are known to be at markedly higher risks for poor health outcomes and health behaviors, including substance use, compared to most “Asian” groups (eg, Chinese, Japanese, Korean).² For example, Native Hawaiians in Hawaii are at highest risk for cancer mortality³ and Native

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Human Subjects Statement

The human subjects protection protocol for this study was approved by the Institutional Review Board (IRB) of the institution where the research was conducted (CHS #18862).

Conflicts of Interest Statement

The authors have no conflicts of interest to report.

Hawaiians of all age-groups tend to show higher prevalence of tobacco and other substance use, compared to other ethnic groups in the state.⁴⁻⁶ Currently, little is known about substance use risk factors that are unique to Native Hawaiians. Researchers have stressed the need to study the health behaviors and health outcomes of high-risk ethnic groups in relation to the groups' unique socio-cultural contexts.⁷ Native Hawaiians have had a unique history, thereby elevating the importance of examining substance use in this population.

Historical Trauma

Historical trauma refers to the traumatic experiences undergone by members or descendants of national, religious or racial/ethnic groups, historically or at present times, as a result of colonization, war, genocide, or other forms of social, political, and cultural subjugation.^{8,9} Historical trauma is receiving increasing research attention in relation to the mental and physical health and health behaviors of American Indians in the US.¹⁰⁻¹² Researchers have argued that historical trauma is inter-generationally transmitted such that historical trauma is of significance not only to those who experienced the traumatic events first-hand but also to later generation individuals who may continue to experience some form of traumatic events or may have internalized the trauma as transmitted to them biologically, socially, and culturally.⁸⁻¹⁰ Research among American Indian adults and adolescents has shown that thoughts, feelings, and awareness associated with historical trauma are related to poorer mental health and greater likelihood of being engaged in maladaptive behaviors such as tobacco, alcohol, and other drug use.¹³⁻¹⁶ Theoretically, historical trauma is thought of as a stressor that may directly harm health or encourage health risk behaviors such as substance use as a means of coping.^{8,10,11,17,18}

In research among American Indians, historical trauma has been assessed mainly using 2 types of self-report measures. Of these 2, the more commonly used instrument is the measure of perceived historical loss.¹² The historical loss measure includes 2 subscales: the historical loss subscale, which assesses frequency of experiencing thoughts of cultural or historical loss (eg, thoughts about lost land, culture), and the historical loss associated symptoms subscale, which assesses emotional reactions to the thoughts of historical loss (eg, feel depressed, sad, or angry). The second measure assesses historical trauma in terms of self-report on different types of traumatic events experienced by self and/or relatives, specifically, parents, grandparents, great-grandparents, and great-great-grandparents.¹⁹ The historical loss measure has been found to be a robust predictor of substance use and poor mental health symptoms among American Indians.^{13,15}

The history of Native Hawaiians has been similar to that of American Indians to the extent that both groups underwent colonization and social, political, and cultural subjugation in their ancestral lands. Contact with the colonizers disrupted both groups' traditional ways of life and both groups experienced loss of life in disproportionate numbers after coming into contact with outsiders.²⁰ Thus, historical trauma is pertinent to Native Hawaiians' health as well. However, although historical trauma has been previously discussed in relation to the health and well-being of Native Hawaiians,²¹ no study to date has studied historical trauma among Native Hawaiians empirically.

Clearly, there is a need to study historical trauma among Native Hawaiians, especially in relation to health risk behaviors such as substance use. Further, there is currently a need to refine theoretical models relating historical trauma and substance use.^{17,22} There is a lack of understanding as to how other related psychosocial factors such as current ethnic discrimination fit in the model of historical trauma and substance use. It may be argued that for members of indigenous communities, including Native Hawaiians, historical trauma provides a context to notice and appraise ethnic discrimination in everyday life. Not only may perceived discrimination be shaped by historical trauma, but perceived everyday discrimination also may, in fact, be a greater stressor and a more proximal substance use risk factor than historical trauma.

Perceived Ethnic Discrimination

In mainland US samples of ethnic minorities, ethnic discrimination has been consistently associated with poor health outcomes^{23,24} and substance use.²⁵⁻²⁷ Exposure to ethnic discrimination has been associated with increased stress,²⁸ psychological distress,²⁹ and anger,³⁰ factors that encourage maladaptive coping via substance use. Among Native Hawaiians, perceived ethnic discrimination has been relatively less studied as a substance use risk factor. However, one study found self-reported racial oppression associated with physiological indicators of stress (eg, high cortisol level) among Native Hawaiian adults.³¹ Perceived everyday ethnic discrimination has not been studied among Native Hawaiians.

Perceived everyday ethnic discrimination may be defined as perceived unfair treatment experienced in day-to-day life.³² Examples include having received poor service at restaurants, being followed in stores, and being slighted by others for ethnic or racial reasons. This way of measuring perceived ethnic discrimination, which has been found to be a robust predictor of tobacco and other substance use across ethnic groups,^{26,33} may be of special importance in the context of historical trauma and substance use. For indigenous communities that have experienced traumatic events over time at the hands of alien cultures and continue to exist under the dominance of the same or other alien cultures, experiences of day-to-day unfair treatment are likely to be more salient. Hence, it is likely that an increased sense of historical trauma is related to higher perceived discrimination. In research thus far, the role of perceived discrimination as a mediator of the effects of historical trauma on substance use has not been tested.

The Present Study

This study examined whether historical trauma is associated with substance use among Native Hawaiian community college students. Specifically, we tested the hypothesis that the relationship between greater historical trauma and higher substance use is mediated through higher perceived discrimination in day-to-day life. Cross sectional data were collected from self-identified full or part Native Hawaiian students recruited from classrooms across 3 community colleges in Oahu, Hawaii. In Hawaii, the community college demographics closely match the demographics of the state in terms of ethnicity and socioeconomic status.^{1,34} Moreover, community college students represent greater variability in age and greater variety of emerging adults including those who are transitioning to 4-year colleges,

full-time workers, and students seeking associate degree for various “blue-collar” professions.³⁵

METHODS

Participants

This study is based on self-report data from N = 128 Native Hawaiian community college students who represented a subsample of students that participated (Total N = 539) in a substance use study conducted across 3 community colleges in Oahu, Hawaii. Table 1 shows the demographic characteristics of the study participants. As with other studies based on community college students,^{36,37} more women than men were represented in the current sample.

Procedures

Students were recruited from classrooms across the 3 community colleges and later invited via e-mail to participate in an online survey. Survey administration in the classroom was not feasible because of the survey's length. However, recruiting participants from the classroom provided the opportunity to recruit across various academic disciplines and enhance the representativeness of the sample.

Classroom recruitment—Instructors of 62 classes across the 3 community colleges were contacted by phone or e-mail seeking permission to recruit participants from their classes. Instructors from across the following academic areas were approached: social and behavioral sciences, humanities, math and natural sciences, and nursing and allied health sciences. These areas were selected because they offered maximum number of classes with enrollment sizes of 15 students. Relatively large enrollment sizes were important because visiting a large number of small classes would cost more resources. Of the 62 instructors contacted, 46 agreed to cooperate. Thus, 2 research staff visited 46 classes, of which 33% represented social/behavioral sciences or humanities, 33% represented math or natural science classes, and 34% represented nursing or allied health (eg, medical technology, dental assisting) classes.

First, the research staff described the study, explaining that: (1) the study was about tobacco and other substance use; (2) participation in the study was voluntary; (3) everyone 18 years of age was invited to participate in the study regardless of sex or ethnicity; (4) the study involved providing contact information in the classroom and completing an online survey; and (5) a \$20 gift card would be provided to each participant who completed the online survey. Next, the informed consent protocol was described to the students who expressed interest in participating in the study. Students who provided written consent completed an information sheet and a brief survey in the classroom. N = 673 students provided consent to participate in the study. Of these, N = 161 self-identified as being full or part Native Hawaiian. On average, the consent rate across classrooms was 90%.

Online data collection—Participants who completed the classroom survey were contacted within 3 days via e-mail, inviting them to participate in the online survey. The e-

mail included a uniform resource locator (URL), unique for each individual, which directed each participant to the survey questionnaire. SurveyMonkey.com was used to create and deliver the online survey. For each college, the online survey was kept active until the end of the fifth week after the last classroom visit. Until the survey was kept active, non-respondents received e-mail reminders every third day beginning from the day of the first e-mail invitation. Participants who did not respond by the end of the third week after the last classroom visit also received a telephone reminder.

Of the 673 participants who were invited to participate in the online survey, 539 completed it; of those completing it, 128 were full or part Native Hawaiian. Thus the online response rate was 80%. The participants who responded to the online survey request did not differ from non-respondents in terms of ethnicity or substance use characteristics. However, non-respondents tended to be significantly younger ($p < .05$; 2-tailed) and tended to represent more men than women ($p < .05$; 2-tailed). The online survey was designed in such a way that data on historical trauma were collected only from participants who identified themselves as full/part Native Hawaiian.

Measures

Demographic variables—Demographic variables measured included age, sex, annual household income, and ethnicity. Age, sex, and income were assessed using single-item indicators. Ethnicity was assessed using an instrument that has been validated among adults in Hawaii.³⁸ Participants were asked: *What is your ethnic or racial background?* and were asked to select “all that apply” from a list of ethnicities common in Hawaii and the US: Black/African American, Chinese, Filipino, Hawaiian, Japanese (including Okinawan), Korean, Mexican or other Hispanic, and White or Caucasian. In addition, participants were asked: *Are you full or part Native Hawaiian?* (Yes/No). Participants who identified themselves as “Hawaiian” in response to the first ethnicity question and responded “Yes” to the second ethnicity question were included in the present study.

Historical traumatic events—Eight items relevant to Native Hawaiian experiences were adapted from the Historical Traumatic Events measure that originally contained 13 items designed for American Indians.¹⁹ Each item described a potentially traumatic event (eg, forced to not speak the native language or practice other forms of cultural expression; desecration of traditional lands; forceful occupation of land; experience of medical testing without consent; Table 2) and asked participants if the event occurred to them (ie, self), their parents, grandparents, great-grandparents, and/or great-great-grandparents. Participants responded “Yes” or “No” to each option and were advised to select all options that applied. This study is the first one to test the 8 adapted items among Native Hawaiians.

Historical loss—Eight items adapted from the historical loss scale used in previous research among American Indians¹²⁻¹⁵ were employed (Table 2). Participants were asked how often they thought (eg, several times a day, daily, weekly, monthly, yearly/special times, never) about various types of historical or cultural loss (eg, loss of land, loss of language, loss of their people from early dead, loss of respect by children for elders). The original 12-item scale has shown good reliability and validity, including substance use predictive

validity.¹³ This is the first time the scale was adapted for use among Native Hawaiians. In this study, the 8 items showed excellent internal consistency (Cronbach's alpha = .94).

Perceived discrimination—Perceived ethnic discrimination was assessed with a widely used 9-item measure of self-reported everyday experiences of unfair treatment.³² Different from the original measure, however, in the present study, participants were directly asked how often they experienced instances of day-to-day unfair treatment because of their ethnicity. In the original measure, respondents first rate the frequencies of having experienced unfair treatment and then report on the perceived reason(s) for unfair treatment, with “ethnicity” provided as one possibility. Examples of unfair treatment represented by the 9 items include being subject to poorer services at restaurants, being followed around in stores, being treated with less courtesy, and being thought of as less smart. The 9 items showed excellent internal consistency in this sample (Cronbach's alpha = .91).

Substance use—Substance use was measured in terms of past 30-day cigarette, alcohol, and marijuana use. Alcohol use was measured in terms of frequency of having gotten drunk. Participants were asked how often they had gotten drunk, and used cigarettes or marijuana, and were asked to rate the frequencies on an 11-point scale (0 times, 1-10 times, 11-20 times, 21-30 times,..., 91-100 times, over 100 times). This way of measuring substance use has been validated in previous research.^{39,40} Further, self-report measures of substance use are considered to be valid across different ethnic groups.⁴¹

Data Analysis

Descriptive analyses were performed using the SAS statistical program. Structural equation modeling (SEM) in *Mplus* was used to test the study hypotheses. In the SEM analysis, historical trauma was specified as a latent variable, with historical traumatic events and historical loss as indicators. An index of historical traumatic events was created by summing up all positive responses (ie, for self, parents, grandparents, great-grandparents, and great-great-grandparents) per item across all 8 items. Similarly, a composite index for historical loss was created from responses across the 8 items of the historical loss scale.

Historical trauma was specified as an exogenous variable, along with age, sex, and income. Perceived ethnic discrimination was specified as a mediator and substance was specified as a criterion variable. A single substance use variable was created by combining use or non-use of cigarette, alcohol, and marijuana in the past 30 days. Covariances were specified among all exogenous variables.

Two steps were followed to determine the relationships among study variables. First, paths were specified from all exogenous variables to the mediator and the criterion variable and a path was specified from the mediator to the criterion variable. The fit of this model to the data was examined. Next, the model was fit to the data again, but retaining only the paths found to be statistically significant in the first step. The goodness-of-fit of the model to the data was determined based on a chi-square statistic, comparative factor index (CFI), and Root Mean Square Error of Approximation (RMSEA).

RESULTS

Table 1 lists the basic descriptive statistics pertaining to the key study variables. Table 2 shows the data related to historical traumatic events, historical loss, and perceived discrimination in more detail. For each traumatic event, the percentage of participants who reported having experienced the event themselves was small. As would be expected, more participants reported earlier generations as having experienced such events. Notably, 18% to 20% participants reported that their grandparents, great-grandparents, and/or great-great-grandparents were forced not to speak the native language or practice other forms of cultural expression; moreover, they were subjected to non-natives occupying, visiting, or living on native land and prohibiting access to traditional fishing, hunting, or food gathering sites.

At least once a year or at special occasions, approximately 81% of the participants reported thinking about the loss of their ancestral land, 87% reported thinking about loss of language, and 66% reported thinking about loss of self-respect from poor treatment by government officials. Between 12% and 15% the of participants reported that they thought “several times a day” about the loss of respect by children for elders or traditional ways. Approximately 75% of the participants reported at least one occasion of having experienced ethnic discrimination in some form. The most common reported forms of everyday ethnic discrimination included being treated by others with less courtesy, with less respect, as being less intelligent, and as being not as good.

Table 3 shows the bivariate relationships among study variables in terms of zero-order correlations. Reported occurrences of historical traumatic events to self, parents, grandparents, great-grandparents, and great-great-grandparents were significantly correlated among each other. Indices of historical traumatic events, historical loss, and perceived ethnic discrimination were positively and significantly correlated among each other. Perceived discrimination was significantly correlated with cigarette use. Cigarette, alcohol, and marijuana use were positively and significantly correlated among each other. Older age was significantly correlated with higher reported occurrences of historical trauma events to self and others and also with the higher composite index of historical traumatic events.

Results of the SEM analysis are shown in Figure 1. Both historical traumatic events and historical loss indicators loaded strongly and statistically significantly on the latent factor representing historical trauma. The first model in which paths were specified from all exogenous variables to perceived discrimination and substance use and from discrimination to substance use resulted in 3 statistically significant paths ($p < .05$): direct paths from historical trauma to perceived discrimination and substance use and a direct path from perceived discrimination to substance use. None of the paths from the demographic variables to the mediator or the criterion variable was statistically significant. Hence, the model was fit again, retaining only the statistically significant paths and retaining all the covariance specified among exogenous variables, including the demographic variables. The latent historical trauma construct did not show statistically significant correlations with age, sex, or income. The fit statistics for the model were as follows: $\chi^2 = 14.7$ ($df = 10$; $p = .14$); CFI = 0.95; RM-SEA = 0.06. Thus, the model showed a good fit to the data. The indirect effect of

historical trauma on substance use through perceived discrimination was statistically significant [standardized indirect effect = 0.15 (SE = 0.07); $p < .05$].

DISCUSSION

This study attempted to determine whether historical trauma was associated with substance use among Native Hawaiian community college students and whether the relationship was mediated through perceived everyday discrimination. We found perceived discrimination to mediate the effects of historical trauma on substance use in the sample but we also found a separate, inverse association between historical trauma and substance use. Delving deeper into the way historical trauma was operationalized in the present study may help better interpret these findings.

We tested 2 measures of historical trauma that have been used previously among American Indians in mainland US samples. The mean levels of historical traumatic events experienced by self and relatives (ie, parents, grandparents etc.) in the current sample were lower compared to the levels reported in the previous study with American Indians.¹⁹ However, we should note that 5 items in the original measure that exclusively applied to American Indians were removed in the traumatic events measure we used. Perhaps the removed items were endorsed frequently by American Indian participants because the items represented events central to the American Indian historical experiences, thereby resulting in higher mean levels of historical trauma events experienced. However, the historical traumatic events measured in the present study appear to be adequately applicable to the Native Hawaiian context: the index of historical traumatic events created by summing up items across self and relatives showed a relatively high positive correlation with the historical loss scale.

The frequencies of responses across the items of the historical loss scale were mostly comparable to what Whitbeck et al¹² found in their sample of American Indian adults. However, individuals who reported that thoughts of historical loss occurred to them “yearly or at special occasions” were of greater proportion in the current sample. The American Indian sample was more likely to report that thoughts of historical loss occurred to them “daily” or “several times a day.” Among the 8 items that were assessed in both samples, the frequency of a thought of historical loss never occurring ranged between 10% and 30% in the present sample compared to 9% and 29% in the American Indian sample. Thus, similar to American Indians, historical loss appears to be on the minds of contemporary Native Hawaiians.

The historical traumatic event indices for self, parents, grandparents, and great-great-grandparents were significantly and positively correlated with age. Although this association suggests that older individuals seem more knowledgeable about historical traumatic events, it is not clear if that is so because older individuals experienced such events first-hand, had more opportunities to learn about such events from older relatives, or that individuals in general learn about historical traumatic events more as they grow older. The relationship between age and historical trauma needs additional study.

Another issue that needs further research concerns determining the importance of historical trauma as a stressor. The strength of historical trauma as a stressor is poorly understood. In the current study we did not find either of the 2 indices of historical trauma or individual historical traumatic events correlated significantly with cigarette, alcohol, or marijuana use. However, historical trauma measures were positively correlated with perceived ethnic discrimination and perceived discrimination was significantly correlated with higher cigarette use.

The pattern of correlations suggests that historical trauma may influence a more proximal risk factor of substance use such as perceived discrimination. This finding was congruent with our hypothesis which posited that perceived discrimination mediates the relationship between historical trauma and substance use. The hypothesis was supported by the next level of analysis, namely the SEM analysis. The mediation model we tested fit reasonably well to the data. Higher experience of historical trauma was related to higher perceived day-to-day discrimination, and consistent with previous findings,²⁵⁻²⁷ higher perceived discrimination was related to higher levels of recent substance use. These findings may be interpreted to suggest that thoughts, knowledge, and/or experience of historical trauma provide a cultural context to understand and appraise others' discriminatory behaviors towards self, and by doing so, function as stressors that may place one at risk for substance use.

A seemingly anomalous finding of this study was the direct, negative path linking historical trauma with substance use. Theoretically, historical trauma is considered a stressor and to our knowledge, an inverse association between historical trauma and substance use or any maladaptive behavior has not been recorded previously. However, previous studies have not commonly examined the relationship between historical trauma and substance use in terms of mediated and direct paths or measured latent historical trauma construct using more than one measure. Thus, our study raises some interesting questions about what historical trauma may signify for current young adults and other adults, the majority of whom are several decades away from the initial and presumably more traumatic phases of colonization.

The individuals who scored higher on the measures of historical trauma are likely to be individuals who are also culturally conscious and know family history and/or history of the community. It has been argued previously that intergenerational experiences with historical trauma may promote resiliency factors such as ethnic pride or greater identification with one's culture.⁴² In minority groups, including Native Hawaiians,⁴³ greater identification with one's culture and ethnic pride are considered to be protective against maladaptive behaviors, including substance use.⁴⁴ Because we did not measure ethnic pride or cultural identification, we could not test whether these variables mediated the protective effect of historical trauma on substance use. Still, based on our findings, it appears that historical trauma may have contrasting effects on substance use behavior through separate mechanisms.

Lack of ethnic pride or cultural identification measure is a limitation of this study. There are other limitations of this study that need to be considered when interpreting its findings. Our sample size was relatively small and included more women than men, which may limit generalizability. Further, most participants were younger adults; hence, our findings may not

apply to youths or older adults. We did not collect enough data to distinguish “full” Native Hawaiians from “part” Native Hawaiians, which limits our ability to infer what proportion of the current sample was full Native Hawaiian versus part. Future studies would be able to answer the questions regarding group differences between full and part Native Hawaiians, in the relationships among historical trauma, perceived discrimination, and substance use. Another limitation is that we did not measure stress or psychological distress associated with historical trauma and perceived discrimination. Lastly, our data were cross sectional. Hence, the findings should not be interpreted as causal. The mediational model was constructed based on theoretical assumptions rather than actual temporal order of the variables.

Despite its limitations, this study is significant for a number of reasons. First, this study likely represents the first attempt to study historical trauma among Native Hawaiians empirically in the context of substance use or other variables. Second, this study tested for the first time existing measures of historical trauma among Native Hawaiians. Third, this study is significant for testing perceived discrimination as a mediator of the effects of historical trauma on substance use. Our findings may be thought of as important preliminary evidence showing the relevance of studying historical trauma as a predictor of substance use among Native Hawaiians and highlighting the importance of studying perceived ethnic discrimination in the context of historical trauma. Importantly, this study noted that historical trauma may have a protective effect on substance use as well, and thus, stressed the need for additional research to examine multiple measures and mediators of historical trauma. Validation of the model developed in this study through future research may have important implications for prevention. The model suggests that thoughts and awareness related to historical trauma may not be harmful to health if issues associated with contemporary ethnic discrimination are addressed and individuals are equipped with skills and resources to manage stress or distress associated with perceived discrimination.

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*** $p < .001$; ** $p < .01$; * $p < .05$

Note.

Coefficients presented are standardized. Age, sex, and income were entered as covariates in the model and treated as exogenous variables. The paths from age, sex, and income to perceived discrimination and substance use were statistically non-significant ($p > .05$; 2-tailed).

Figure 1.

Model Representing the Relationships among Key Study Variables (N = 128)

Table 1

Participants' Demographic and Other Characteristics (N = 128)

Characteristics		Mean (SD)	Frequency
Age		27.5 (9.5)	
Sex	Men		34.6%
	Women		65.4%
Annual household income	\$0-\$19,999		33.9%
	\$20, 000- \$39,999		28.2%
	\$40,000-\$59,999		15.6%
	\$60,000 or over		19.4%
Historical traumatic events^a	Self	0.33 (0.88)	
	Parents	0.30 (0.88)	
	Grandparents	0.73 (1.49)	
	Great-grandparents	0.84 (1.62)	
	Great-great-grandparents	0.80 (1.55)	
	None	4.60 (3.15)	
Historical loss^b		21.4 (9.9)	
Perceived discriminatio^c		18.9 (8.8)	
Used cigarette in past 30 days			20%
Got drunk in past 30 days			30%
Used marijuana in past 30 days			13%

Note.

SD = Standard deviation

^a Average of the sum across 8 items for each category (ie, self, parents, grandparents, great-grandparents, great-great-grandparents, and "none of the above.")

^b Average of the sum across 8 items

^c Average of the sum across 9 items

Table 2

Response Frequencies across Items of Historical Traumatic Events, Historical Loss, and Perceived Discrimination Measure (N = 128)

Historical traumatic events	Self	Parents	Grand parents	Great grandparents	Great-great grandparents	None
Forced to not speak native language or practice cultural expression	4.7%	4.7%	18.8%	18.0%	19.5%	40.6%
Desecration of traditional lands	6.3%	4.7%	10.9%	17.2%	14.1%	48.4%
Non-natives occupying, visiting, or living on Native land	14.6%	12.5%	20.3%	19.5%	17.2%	41.4%
Experienced medical testing, experimentation	2.3%	2.3%	3.1%	1.6%	2.3%	68.8%
Forcibly removed by the US government from traditional homelands and relocated	1.6%	6.3%	3.9%	6.3%	5.5%	66.4%
Received treatment by poorly qualified medical staff	0.8%	1.6%	6.3%	6.3%	3.1%	65.6%
Arrested, imprisoned, or experienced police brutality	1.6%	0%	2.3%	3.9%	3.9%	68.8%
Native traditional healing or spiritual practices outlawed or prohibited	1.2%	3.1%	7.0%	10.9%	14.1%	57.8%

Historical loss	Never	Yearly or at special occasions	Monthly	Weekly	Daily	Several times a day	Don't know
Loss of land	14.3%	41.8%	9.2%	16.3%	6.1%	8.2%	4.1%
Loss of language	10.1%	40.4%	12.1%	19.2%	9.1%	6.1%	3.0%
Loss of traditional spiritual ways	17.5%	34.0%	15.5%	10.3%	12.4%	6.2%	4.1%
Loss of self-respect from poor treatment by government officials	30.2%	25.0%	15.6%	13.5%	5.2%	6.3%	4.2%
Loss of culture	11.2%	29.6%	18.4%	16.3%	14.3%	8.2%	2.0%
Loss of respect by children for elders	21.2%	19.2%	18.2%	9.1%	15.2%	15.2%	2.0%
Loss of people through early death	20.4%	26.5%	14.3%	12.2%	11.2%	9.2%	6.1%
Loss of respect by children for traditional ways	16.5%	28.9%	17.5%	6.2%	14.4%	12.4%	4.1%
Perceived discrimination	Never	Once	2 or 3 times	5 or 6 times	Very often		
Treated with less courtesy than other people	35.4%	24.4%	28.4%	7.8%	3.9%		
Treated with less respect than other people	37.0%	18.1%	31.5%	9.5%	3.9%		
Received poor service than other people at restaurants or stores	45.7%	23.6%	22.8%	5.5%	2.4%		
People have acted as if they think you are not smart	32.3%	25.2%	25.2%	9.5%	7.9%		
People have acted as if they are afraid of you	61.4%	15.0%	11.0%	6.3%	6.3%		
People have acted as if you are dishonest	55.1%	18.1%	15.8%	7.9%	3.2%		
People have acted as if they are better than you are	25.2%	18.9%	29.9%	10.2%	10.8%		

Historical loss	Never	Yearly or at special occasions	Monthly	Weekly	Daily	Several times a day	Don't know
You have been called names or insulted	48.8%	22.8%	14.2%	9.5%	4.7%		
You have been threatened or harassed	59.8%	18.1%	11.8%	5.5%	4.7%		

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Table 3

Zero-order Correlations among Study Variables

	Age	Sex	INC	HT S	HT P	HT G	HT GG	HT GGG	HT	LOSS	DIS-CRI	CIG	ALC	MAR
Age	1													
Sex	.13	1												
INC	-.07	-.08	1											
HT S	.22*	.03	-.03	1										
HT P	.33**	.12	-.09	.73***	1									
HT G	.18*	.12	-.02	.52***	.69***	1								
HT GG	.12	.11	-.004	.36***	.52***	.78***	1							
HT GGG	.17*	.02	.02	.36***	.51***	.67***	.71***	1						
HT	.23**	.10	-.02	.64***	.79***	.91***	.87***	.84***	1					
LOSS	.08	-.04	-.06	.31**	.36***	.60***	.57***	.56***	.63***	1				
DIS-CRI	.06	-.04	-.01	.17*	.28**	.39***	.31***	.31***	.37***	.53***	1			
CIG	.12	-.02	-.07	.05	.02	.09	.10	.04	.08	.09	.19*	1		
ALC	-.05	-.04	.08	-.06	-.06	-.05	-.07	-.12	-.09	.04	.08	.35***	1	
MAR	-.14	-.11	.002	-.09	-.09	-.05	-.05	-.09	-.08	.08	.06	.08	.30***	1

Note.

INC = Income; HT S = Historical traumatic events—self; HT P = Historical traumatic events—parents; HT G = Historical traumatic events—Grandparents; HT GG = Historical traumatic events—Great -grandparents; HT GGG = Historical traumatic events—Great-great-grandparents; LOSS = Historical loss; DIS-CRI = Perceived discrimination; CIG = Past 30-day frequency of cigarette use; ALC = Past 30-day frequency of getting drunk; MAR = Past 30-day frequency of marijuana use

p < .001

**

p < .01

*

p < .05