Self-Reported Experiences of Discrimination and Depression in Native Hawaiians

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Abstract

Discrimination is an acute and chronic stressor that negatively impacts the health of many ethnic groups in the United States. Individuals who perceive increased levels of discrimination are at risk of experiencing psychological distress and symptoms of depression. No study to date has examined the relationship between perceived discrimination and mental health in Native Hawaiians. The purpose of this study is to explore the relationship between perceived discrimination and depression based on the Homestead Health Survey mailed to Native Hawaiian residents of Hawaiian Home Lands. This study also explores the role of cultural identity and how it may impact experiences of discrimination and symptoms of depression. Based on cross-sectional data obtained from 104 Native Hawaiian residents, a significant positive correlation was found between perceived discrimination and symptoms of depression (r= 0.32, P*<.001). Cultural identity did not significantly correlate with discrimination or depression. Multiple linear regression analyses indicate that the relationship between depression and discrimination remained statistically significant (coefficient estimate of 0.18;* P*<.01), after accounting for differences in socio-demographics and degree of identification with the Native Hawaiian and American cultures. These findings are consistent with other studies that have focused on the effects of discrimination on psychological wellbeing for other ethnic minority populations.*

Introduction

Discrimination is an acute and chronic stressor that threatens the health of racial and ethnic minorities and lower socioeconomic groups in the United States.[1,2] During the last few decades, increased attention has focused on discrimination and its negative impact on health.[1] Individuals who perceive increased levels of discrimination are at a greater risk of experiencing psychological distress and symptoms of depression.[3,4] Indices of psychological distress are found to mediate the relationship between discrimination and physical health.[5] Research indicates that ethnic minority populations are most at risk of experiencing discrimination due to their race/ethnicity, poorer economic status, or a combination of these factors, which may result in poorer mental health.[6-9]

Studies examining the health of Native Hawaiians, the indigenous people of Hawai'i, show poorer health outcomes for Native Hawaiians compared with all other major ethnic groups in the State of Hawai'i,[10-13] which in part may be attributed to experiences of discrimination.[14] Prior to Western contact, Native Hawaiians were described as a healthy and robust population.[15] Today, they are at increased risk for many physical and mental health concerns.[11-13] According to the most recent Behavioral Risk Factor Surveillance System (BRFSS) reports, approximately 13.7% [(95% confidence interval (CI) =11.9-15.6)] of Native Hawaiian adults have been diagnosed with a depressive disorder, compared with the state average of 11.2% (95% CI=10.6-11.8).[16] Exploring the way discrimination influences depression of Native Hawaiians may shed light on the extent to which perceived discrimination leads to poorer mental health. Uncovering this relationship could lead to a better understanding of the mechanisms by which social inequities are associated with mental health disparities observed in Native Hawaiians.

To date, no study has explored the relationship between discrimination and mental health in Native Hawaiians despite their susceptibility to experiencing discrimination.[14,15] Minimal studies with Native Hawaiian participants demonstrate a positive relationship between perceived discrimination and poorer physical health outcomes such as increased hypertension and being overweight or obese.[14,17] These findings support the notion that perceived discrimination may have a negative influence on hypertension and other stress-related health outcomes among Native Hawaiians, consistent with research focusing on other indigenous and ethnic minority populations.[6-9,14,17]

Studies focusing on ethnic identity, discrimination, and health demonstrate a paradoxical relationship, identifying ethnic identity as a factor that may positively or negatively impact the relationship between discrimination and health.[18] In general, previous research exploring the impact of Native Hawaiian cultural identity suggests that individuals with increased identification with the Hawaiian culture are at greater risk of experiencing poorer health outcomes because of greater cultural discord with the mainstream culture.[19-21]

In 1921, Congress signed the Hawaiian Homes Commission Act into law, which designated 200,000 acres of government-sponsored homelands for individuals with a minimum of 50 percent Hawaiian blood quantum.[22] Today, there are approximately 9,450 Hawaiian Home Land lessees.[23] Data on residents of Hawaiian Home Lands are substantially limited.[24] Exploring the relationship between everyday experiences of perceived discrimination and mental health outcomes in individuals residing on Hawaiian Home Lands is particularly important due to individuals demonstrating susceptibility to experiencing low socio-economic status, which has been shown to be associated with poorer health outcomes.[23,24] To address this gap in the literature, the primary aim of this study is to examine the relationship between perceived discrimination and depression symptoms of Native Hawaiians residing on Hawaiian Home Lands with a study hypothesis of greater perceived discrimi-

nation being associated with more depression symptoms. As a secondary aim, this study will explore the role of cultural identity and how it may influence the relationship between perceived discrimination and depression symptoms.

Methods

Study Design and Participants

This study was approved by the University of Hawai'i Institutional Review Board (IRB). Cross-sectional data were obtained from individuals who participated in the Homestead Health Survey Project. Approximately 390 individuals residing on selected Hawaiian Home Lands from the island of O'ahu were invited to participate in this pilot study.

Procedures

Co-investigators of the Homestead Health Survey, including the primary author of this report, assembled and designed the survey based on adapted and pre-existing scales. This study used a community-based participatory research (CBPR) approach that included community members as co-investigators who directly participated in all phases of this study, to include co-authoring of this report. Blank surveys were mailed to lessees currently residing on Hawaiian Home Lands from the island of O'ahu between January and April 2015. Prospective participants also received a personalized cover letter describing the purpose of the project and a consent form explaining the informed consent process. Participants were compensated with a $15 gift card for participating in the survey.

Instruments

Table 1 summarizes variables and measures of this study. Demographic and socio-economic variables were measured by items that used the same language as items included in the BRFSS including age (in years), gender (1=male and 2 = female), annual household income, and education level. Participants reported their annual household income based on nine answer choices, which were coded into four categories: (1) less than $25,000, (2) $25,000 to less than $50,000, (3) $50,000 to less than $75,000 and 4) $75,000 or more. Education was measured by asking participants to report their highest grade or year of school completed, which was coded as (1) high school or equivalent and less, (2) some college, and (3) college graduate.

Discrimination was measured with the Everyday Discrimination Scale (EDS), which measures frequency of experiencing perceived acts of discrimination in a respondent's day-to-day life. The scale consists of 9-items on a Likert-type response scale ranging from 1 (never) to 6 (almost everyday), with a final score ranging from 9-54.[8] Higher scores indicate increased frequency of perceived discrimination. Example items include "You are treated with less courtesy than other people are" and "People act as if they are afraid of you." Participants were asked to indicate the main reason for experiences of discrimination, which included their race, ancestry, or national origins; gender; skin color; education or income level; or a physical disability. The EDS has been previously validated in other populations, with high levels of internal consistency.[27,28] Measures of internal consistency for the EDS were high in our full sample (N=125) with a Cronbach's Alpha of 0.90.

Native Hawaiian cultural identity and American cultural identity, respectively, were measured with the Native Hawaiian Cultural Identity Scale (NHCIS) and the American Cultural Identity Scale (ACIS).[21] Each scale consisted of 4-items, which measured an individual's knowledge, attitudes, feelings, and association with both cultures. An example item includes "How do you feel toward the Hawaiian (or American) culture and lifestyle?" Items were scored based on a series of answers ranging from 1 to 5 with a total score ranging from 4-20 for each scale. Higher scores indicate a stronger identity with the Native Hawaiian or American culture.

Depression was measured through the 11-item Center for Epidemiologic Studies-Depression (CES-D) measure.[25] The CES-D is a self-report scale that measures the frequency of experiencing depressive symptoms during the past week based on four sub-scales: depressed affect, positive affect, somatic symptoms, and interpersonal symptoms. Depressed affect includes feelings of depression, loneliness, and sadness. An individual with positive affect may experience feelings of happiness and enjoying life. Somatic symptoms of depression are characterized as physical symptoms that may impact daily functioning of an individual including poor appetite, feeling as though everything is an effort, and restless sleep. Interpersonal symptoms of depression are characterized as problems related to interactions with individuals that may impair social functioning. Examples include feeling as though other people are unfriendly or feeling as if people dislike the individual. Responses were based on a Likert scale ranging from rarely (less than 1 day) to most of the time (5-7 days) with final scores ranging from 0-33. Higher scores indicate increased symptoms of depression. Measures of internal consistency of the CES-D were high in our full sample (Cronbach's Coefficient Alpha =0.84, Spearman Brown Coefficient =0.85 and Guttman Split-Half Coefficient =0.85), consistent with other studies that utilized this scale as a measure of depression.[25]

Data Reduction and Statistical Analysis

Returned surveys were assigned an identification number to ensure confidentiality. Data from returned surveys were then entered into REDCap, a secured, electronic database. Characteristics of study participants were summarized by descriptive statistics. Pairwise correlation coefficients for CES-D, CES-D subscales, EDS, NHCIS and ACIS scores were obtained and tested for significance. Multiple linear regressions were performed to confirm findings from the correlation analysis with CES-D scores as the outcome variable after adjusting for age (in years), gender, education, income level, and the NHCIS and ACIS scores. All data analyses were performed in SAS 9.3.[26] A two-tailed *P*-value of less than 0.05 was regarded as statistically significant.

Results

Participant Characteristics

In total, 125 participants out of 390 adults over the age of 18 agreed to participate in the pilot study, with a response rate of 32.1%. Due to missing data, 21 participants were removed from the dataset, yielding a final sample of 104 participants. Table 2 summarizes the characteristics of participants from this study. Participants included in the final sample were predominantly female (73.1%, n=76) with an average age of 56.3 years (SD=13.3). Approximately 45% of the sample had an annual household income of less than $50,000.

Participants had an average summed score of 8.4 (out of 20) for the NHCIS and 8.8 (out of 20) for the ACIS. About 81% of the sample (n=84) highly identified with both the Native Hawaiian and American cultures, with scores of 12 or higher on both scales. The average summed score of discrimination measured by the EDS was 17.1 (out of 54, with possible scores ranging from 9-54). Participants selected race, ancestry, or national origin (41.4%) as the main reason for experiences of discrimination, followed by education or income level (37.5%), gender (30.8%), skin color (18.3%), and physical disabilities (10.6%).

The average summed score of the CES-D was 4.6, indicating on average, participants experienced depressive symptoms that were not of clinical significance.

Table 1. Summary of Study Variables and Measures

Participant Characteristics	Independent Variables	Dependent Variables
Demographic and socio-economic variables • Behavioral Risk Factor Surveillance System (Reported as a mean or N[%])	Discrimination • Everyday Discrimination Scale score (continuous)	Primary Outcome: Depression • Center for Epidemiologic Studies-Depression (CES-D) score (Continuous)
Reasons for experiences of discrimination • Everyday Discrimination Scale (Reported as N[%])	Cultural Identity • Native Hawaiian Cultural Identity Scale score (continuous) • American Cultural Identity Scale score (continuous)	Secondary Outcomes: Subscales of depression • CES-D Depressed Affect Subscale score (continuous) • CES-D Positive Affect Subscale score (continuous) • CES-D Somatic Subscale score (continuous) • CES-D Interpersonal Subscale score (continuous)

Table 2. Study Participant Characteristics (n=104)

Characteristics	Mean (SD) or Percent
Age (years)	56.3 (13.3)
Female (vs male)	73.1%
Educational attainment	
High School diploma or equivalent and less	38.5%
Some college/technical/vocational	33.7%
College graduate	26.9%
Missing	0.9%
Income	
Less than $25,000	15.4%
$25,000 to $50,000	29.8%
$50,000 to $75,000	6.7%
$75,000+	36.5%
Missing	11.6%
Everyday Discrimination Scale (EDS) mean Score	17.1 (7.9)
Reasons for experiences of discrimination	
Race, ancestry, or national origin	41.4%
Gender	30.8%
Skin color	18.3%
Education level or income level	37.5%
Physical disability	10.6%
Native Hawaiian Cultural Identity Scale (NHCIS) mean score	8.4 (3.1)
American Cultural Identity Scale (ACIS) mean score	8.8 (2.9)
Center for Epidemiologic Studies-Depression (CES-D) mean score	4.6 (5.3)

Correlation Findings

Correlation analyses were conducted to determine the pairwise Pearson correlations amongst summed depression scores of the CES-D, CES-D sub-scales, discrimination scores from the EDS, and cultural identity scores from the NHCIS and ACIS using a two-tailed test for the final sample of 104 people (Table 3). Correlation analyses indicated a significant and moderately positive association between the summed scores of the EDS and CES-D ($r = 0.32$, $P < .001$). When considering specific aspects of depression, the discrimination EDS scores were found to have a significant positive association with the CES-D somatic subscale ($r = 0.33$, $P < .001$) and the CES-D interpersonal subscale ($r = 0.40$, $P < .0001$). Cultural identification scores (NHCIS and ACIS) had no significant correlation with either depression or discrimination scores. Nonetheless, NHCIS scores were positively and significantly correlated with ACIS scores ($r = 0.54$, $P < .0001$).

Multiple Linear Regression Findings

Multiple linear regression analyses were conducted to examine the relationship between CES-D and EDS after accounting for socio-demographic variables, NHCIS scores, and ACIS scores (Table 4). The multiple regression model produced $R^2 = 0.26$, $F(10,93) = 3.29$, $P < .01$ with depression scores from the CES-D as the outcome variable, $R^2 = 0.18$, $F(10,93) = 2.08$, $P < .05$ with the CES-D somatic subscale score as the outcome variable, and $R^2 = 0.29$, $F(10,93) = 3.87$, $P < .001$ with CES-D interpersonal subscale score as the outcome variable.

As shown in Table 4, discrimination scores from the EDS had a positive and significant association with depression scores from the CES-D, with a weak coefficient estimate of 0.18 ($P < .01$), suggesting that individuals who perceived more frequent acts of discrimination tended to report greater symptoms of depression after controlling for other variables in the model, including socio-demographic variables and cultural identity. Similar findings were observed between discrimination and the CES-D somatic subscale of depression, with a very weak coefficient and positive estimate of 0.09 ($P < .01$) and the CES-D interpersonal subscale of depression, with a very weak and positive coefficient estimate of 0.05 ($P < .0001$). Income levels greater than $75,000 were significantly and negatively associated with depression scores of the CES-D, indicating that individuals with higher levels of income reported less symptoms of depression. Other demographic predictors including age, gender and education were not significantly associated with depression scores of the CES-D. To test the potential moderating effects of the NHCIS and ACIS scores on the association between EDS scores and CES-D scores, interaction terms (eg, NHCIS x EDS) were created and tested (data not shown). The interactions were not statistically significant ($P > .05$).

Discussion

In this study, the effects of discrimination and cultural identity on depressive symptoms were examined based on cross-sectional data collected from a survey administered to residents of Hawaiian Home Lands on the island of O'ahu. To date, this is the first study to examine the relationship between discrimination and depressive symptoms in Native Hawaiians. The findings demonstrate a weak and positive association between perceived discrimination and depression, which suggests that Native Hawaiians who reported more frequent acts of discrimination toward them also reported increased levels of depression symptoms, even after controlling for socio-demographic factors and identification with the Native Hawaiian and American cultures. In particular, perceived discrimination had a very weak and positive correlation with somatic and interpersonal symptoms of depression, suggesting that Native Hawaiians who perceived increased experiences of discrimination were likely to report increased symptoms of somatic and interpersonal depression. Depressed and positive affect, on the other hand, were not statistically related to experiences of discrimination.

These findings shed light on the way perceived acts of discrimination may influence reported symptoms of depression through somatic and interpersonal symptomology. In particular, negative interactions with other individuals due to feelings of inferiority or perceived discrimination may manifest as somatic

Table 3. Pairwise Pearson Correlation Coefficient (r) Matrix of Discrimination, Cultural Affiliation, and Depression

	CES-D	Depressed Affect	Positive Affect	Somatic Symptoms	Interpersonal Symptoms	EDS	NHCIS	ACIS
Depression (CES-D)	1.00	0.85***	0.59***	0.89***	0.61***	0.32**	0.17	0.12
Depressed Affect		1.00	0.37**	0.69***	0.35**	0.17	0.15	0.07
Positive Affect			1.00	0.29*	0.24*	0.10	0.16	0.12
Somatic Symptoms				1.00	0.49***	0.33**	0.11	0.07
Interpersonal Symptoms					1.00	0.40***	0.13	0.13
EDS						1.00	0.18	0.00
NHCIS							1.00	0.54***
ACIS								1.00

*$P < .05$, **$P < .001$, ***$P < .0001$

CES-D = Center for Epidemiologic Studies-Depression. CES-D sub-scales include depressed affect, positive affect, somatic symptoms, and interpersonal symptoms. EDS = Everyday Discrimination Scale. NHCIS = Native Hawaiian Cultural Identity Scale. ACIS = American Cultural Identity Scale.

and interpersonal symptoms of depression. As such, future research should further explore the way specific aspects of depression are impacted by perceived acts of discrimination as they may be targets for interventions. Income was the only socio-demographic predictor found to be significantly related to depression. Individuals who reported higher levels of income also reported decreased symptoms of depression. Education and income levels followed race, ancestry, or national origins as the most common reason for experiences of discrimination.

The authors were also interested in observing the way cultural identity may impact the relationship between discrimination and depression. In some studies, ethnic identity is identified as a coping resource that may mediate stress experienced through discrimination.[18] Other studies demonstrate the way cultural identity may intensify stressors of discrimination experienced by groups of individuals, such as indigenous peoples, who live in communities that do not value diverse cultures, and thus, exacerbate the negative health outcomes experienced by the individual.[19,20] Correlational analyses from this study indicated these relationships were not statistically significant. However, it should be noted that the relationship between discrimination and Native Hawaiian cultural identity began to approach statistical significance in the pairwise Pearson correlation (r= 0.18, *P*-value=.07). Thus, it is possible there is a positive relationship between stronger cultural identity and frequency of perceived acts of discrimination.

Future research is warranted to determine whether cultural identity serves as a moderating factor for the relationship between perceived discrimination and depression. In this sample of Native Hawaiians, those who reported increased identification with the Native Hawaiian culture also reported increased identification with the American culture. Thus, future researchers may want to expand on this study to include Native Hawaiians who reside on and off of Hawaiian Home Lands, which may provide additional insight on NHCI and ACI amongst Native Hawaiians residing in differing environments who may have varying levels of connectedness or lack of connectedness to the Native Hawaiian culture.

Limitations and Future Directions

Findings of this study were based on cross-sectional data. Consequently, this study has limitations similar to other studies with cross-sectional data including the inability to make causal inferences due to data being collected at one point in time. Data from the Homestead Health Survey was limited to individuals residing on selected Hawaiian Home Lands on the island of O'ahu, with a sample of participants who were pre-dominantly female with a mean age of 56.3 years.

While the findings of this study are consistent with other studies that have examined the effects of discrimination on psychological wellbeing in other ethnic minority populations,[3,4,6-9] findings should be interpreted with caution due to the small

Table 4. Multiple regression analyses with discrimination associated with depression, somatic depression, and interpersonal depression, adjusting for age, gender, education, income and affiliation scores.

	Depression (CES-D)			Somatic Symptoms			Interpersonal Symptoms		
Parameter	Estimate	Standard Error	*P*-value	Estimate	Standard Error	*P*-value	Estimate	Standard Error	*P*-value
Intercept	1.55	6.46	.81	0.72	2.86	.81	1.78	1.07	.10
Everyday Discrimination Scale (EDS) score	0.18	0.06	.007	0.09	0.03	.004	0.05	0.01	<.0001
Age	-0.004	0.039	.91	-0.01	0.02	.72	-0.002	0.007	.76
Gender (male)	0.30	1.17	.80	-0.07	0.58	.90	0.38	0.22	.08
Educational attainment									
Some college/technical/vocational	0.07	1.17	.96	-0.17	0.58	.77	0.18	0.22	.42
College graduate	-0.75	1.43	.60	-0.50	0.71	.49	0.003	0.26	.99
Missing	-4.49	5.32	.41	-1.84	2.63	.49	1.47	0.98	.14
Income									
$25,000 to $50,000	-1.59	1.56	.32	-0.39	0.77	.62	-0.05	0.29	.86
$50,000 to $75,000	-0.51	2.36	.83	-0.49	1.17	.68	-0.24	0.43	.58
$75,000+	-3.27	1.64	.049	-0.91	0.81	.27	-0.27	0.30	.38
Missing	3.36	1.99	.10	1.07	0.98	.28	0.72	0.37	.052
NHCIS	0.10	0.20	.63	-0.005	0.10	.96	-0.033	0.038	.38
ACIS	-0.02	0.21	.91	0.004	0.10	.97	0.034	0.038	.38

Depression was measured through the Center for Epidemiologic Studies-Depression (CES-D). Somatic and interpersonal symptoms were measured as subscales from the Center for Epidemiologic Studies-Depression (CES-D). NHCIS = Native Hawaiian Cultural Identity Scale. ACIS = American Cultural Identity Scale. The reference groups for the categorical variables include: female (for gender), high school diploma or equivalent and less (for educational attainment), and less than $25,000 (for income).

sample size and low beta coefficients in the regression model. Although the sample size of this study is small, the findings indicate the sample was large enough to detect statistically significant relationships at the 0.01 level. These findings may also indicate that the positive relationship between discrimination and depression is significant enough to detect in this small sample. In the future, the Homestead Health Survey should be administered to additional residents of Hawaiian Home Lands, including those residing on other islands, to allow generalizability of the findings to the larger Native Hawaiian population.

Future researchers should consider the way different types of discrimination influence the health of Native Hawaiians based on previous research that indicates different types of discrimination, in addition to frequency of discrimination, differentially affects the risk of health outcomes such as hypertension.[29] Future studies should also explore the impact of discrimination on physical and mental health concurrently to examine the mechanistic pathways of discrimination on health. Previous research suggests discrimination negatively impacts physical health outcomes through psychological distress.[3,5]

Accordingly, the relationship between discrimination and mental health may interplay with the effect discrimination has on physical health outcomes. As such, future researchers should explore whether the relationship between discrimination and psychological indices interacts with or mediates the relationship between discrimination and physical health outcomes (ie, hypertension and obesity) that were found to be significantly and positively associated with discrimination in previous studies focusing on Native Hawaiians.[14,17]

Conclusion

In conclusion, this is the first study to explore the relationship between discrimination and psychological wellbeing, measured through symptoms of depression, for a Native Hawaiian population residing on Hawaiian Home Lands on the island of O'ahu. Individuals who perceived more frequent experiences of discrimination also reported increased symptoms of depression, even after controlling for socio-demographic factors and identification with the Hawaiian and American cultures. Upon examination of the sub-scales measuring depression, somatic and interpersonal symptoms of depression were positively related to experiences of discrimination. However, future research is needed to address limitations of this study.

Conflict of Interest

None of the authors identify any conflict of interest.

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