Discrimination, Psychosocial Stress, and Health among Latin American Immigrants in Oregon

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Abstract

Chronic psychosocial stress related to discrimination has been shown to be associated with biological measures such as elevated systolic blood pressure (SBP), increased body fat, and higher fasting glucose levels. Few studies have examined this relationship in immigrant populations. The present study recruited a sample of 132 Oregon Latino immigrant adults in order to investigate the relationships between perceived discrimination and several health measures (blood pressure, body mass index [BMI], and fasting glucose). Results indicate that perceived discrimination stress predicted elevated SBP among men but not among women. Perceived discrimination was significantly higher among obese women than among women of normal BMI. The same pattern was not observed for men. Further, a strong trend relationship was detected: the higher women's reported discrimination stress, the higher their fasting glucose levels. Again, this pattern was not observed for men. These results suggest that chronic psychosocial stress plays an important role in disease risk among Latin American immigrants, and that male and female immigrants may have distinctive physiological responses. If confirmed, these findings may have important clinical and public health implications for chronic disease prevention among Latinos.

Numerous studies have confirmed that health disparities, such as disproportionate risk of disease among minority populations when compared with the white population, are related to perceptions of racial or ethnic discrimination as a type of stressful life experience (Dressler et al., 2005; Williams et al., 2003). Chronic psychosocial stress linked to discrimination has been shown to be associated with health measures such as elevated systolic blood pressure (SBP; (Williams et al., 2003), increased body fat, and higher fasting glucose levels (DeVogli et al., 2009). Few studies, however, have focused on immigrant populations and considered the implications of discrimination-related health change for chronic disease risk among immigrants (Harrell et al., 2003).

METHODS

Participants

A convenience sample of 132 immigrant adult farm workers in Oregon (≥ 18 years of age; 86 females, 46 males; 96% Mexican origin) was recruited to investigate relationships between perceived discrimination as a chronic stressor and physiological responses. The project involved collaboration with a well-respected community organization that provides

farmworker housing. The target sample was drawn from farmworker residents living in one of three Willamette Valley locations: 1) a small rural community (pop. 8,200); 2) on the outskirts of one of Oregon's medium-sized cities (pop. 149,000); and 3) within an established Latino ethnic enclave (pop. 22,000). The Institutional Review Board at the Oregon Social Learning Center approved the research protocol and all participants provided written consent prior to the assessment. All respondents were assessed in Spanish.

Measurements

Measures included self-reported indicators of perceived discrimination and socioeconomic status (SES) as well as blood pressure and metabolic measures (e.g., body mass index [BMI] and glucose). For interview brevity, specific items were drawn from a larger assessment battery consisting of culturally-specific and psychometrically validated standardized instruments (e.g., Perceived Discrimination [Kessler et al., 1999]). In keeping with Williams and colleagues' (2003) observation that the most useful way to measure discrimination may be to ask about perceptions of unfair treatment, respondents were asked whether they had been treated as if inferior because of their race, ethnicity, skin color, language or nationality within the last three months. Participants could select "0-No," or if reporting one or more discriminatory events, were asked to rate on a 5-point scale the degree of stress they experienced due to the event(s) (1 = not at all stressful to 5 = extremely stressful).

Stature, body mass, and waist circumference (WC) were recorded using standard procedures (Lohman et al., 1988). BMI was calculated as mass divided by height in meters squared (kg/m^2). Blood pressure was measured using an Omron HEM-422CRLC manual inflation oscillometric blood pressure monitor (Vernon Hills, IL) following standard procedures; blood pressure was measured two separate times for each participant. Glucose concentrations (mg/dL) were obtained from fasted participants using 15 μL samples of capillary blood collected from finger prick and using a CardioChek PA analyzer and PTS Panels (Polymer Technology Systems, Indianapolis, IN). This professional glucose testing system meets standard clinical guidelines for accuracy and precision.

RESULTS AND DISCUSSION

Descriptive statistics for age, anthropometric, and health data are presented in Table 1. Approximately 38% of men and 33% of women had a third grade education or less, with 11% of men and 19% of women completing high school or receiving post-secondary education. Ninety-three percent of men and 46% of women were employed; an additional 38% of women reported being homemakers. Heads of household reported an annual median household income of $15,825—one-third that of Oregon households—to support an average household of five people (*SD* = 1.5).

Forty percent of participants reported being treated as if inferior, a higher discrimination prevalence than that reported in most U.S. Latino samples (at 18 to 30%; Pérez et al., 2008). Participants' anthropometric and health measures were generally more favorable than national data for Latinos, with the exception of elevated rates of obesity (BMI ≥ 30) among both sexes, and overweight (BMI 25–29.9) and pre-hypertension (SBP 120–139 or diastolic blood pressure 80–89 mmHg) among women (Table 2). An SES variable was computed from z-scored education and annual household income; occupation was excluded as there was little variance in the farmworker sample. Pearson's correlations showed SES to be unrelated to men and women's blood pressure, BMI, and glucose levels (results not shown), and SES was excluded from later analyses. An established literature demonstrates that more U.S. time in residency (TR) relates to higher discrimination exposure (e.g., Pérez et al., 2008), and poorer health outcomes (e.g., Himmelgreen et al., 2004). In the present study, TR was unrelated to reported discrimination stress (DS) among both men ($r = .16$; $P > .10$) and

women ($r = -.06$; $P > .10$). However, more TR was related to: increased BMI ($r = .28$; $P = .01$) and WC ($r = .29$; $P = .01$) among women (though not men); elevated glucose levels among men ($r = .31$; $P = .04$) (though not women); and showed a trend with higher SBP among both men ($r = .26$; $P = .09$) and women ($r = .18$; $P = .10$).

Among men, multiple regression analyses indicated that higher levels of DS predicted higher SBP ($\beta = 0.34$; $P = 0.01$), after controlling for age, TR, and WC (a stronger confounder than BMI), accounting for 40% of the variance in men's SBP levels. This pattern is similar to that documented elsewhere (Ryan et al., 2006; Sweet et al., 2007). Though women and men reported equal levels of DS (t[129] = $-.07$; $P > .10$), women's stress was not reflected in SBP ($\beta = -.13$; $P = .21$), a finding in keeping with previous research (Brown et al., 2006; Krieger et al., 2008). This sex difference may stem from sociocultural factors, such as depression or changes in eating behavior, or may reflect underlying evolved biological differences between men and women.

Univariate analyses of covariance provide preliminary support for distinct physiological pathways for stress by sex; women measured as obese (based on BMI) reported significantly higher levels of DS than women with normal BMI (after controlling for age and TR) (F[2,81] = 3.7, $P = .03$). Also, women's higher stress showed a strong positive trend with higher fasting glucose levels (adjusted for age, BMI, and TR) ($r = 0.22$; $P = .056$); results were identical when WC was used as a confounder instead of BMI. Among men, no significant associations were detected between DS and BMI ($r = -.12$; $P > .10$), WC ($r = -.01$; $P > .10$), or glucose levels ($r = -.03$; $P > .10$).

Results showing that DS predicted elevated SBP among men and, among women, was significantly associated with obesity and showed a trend with higher fasting glucose levels may, if replicated in a larger representative sample, have clinical and public health implications. Elevated SBP is an established risk factor for cardiovascular disease (Lenfant et al., 2003), and obesity-related insulin resistance and related inflammation are considered to be central elements in the pathogenesis of the metabolic syndrome (Grundy et al., 2005). Further study is clearly needed to establish causal relationships between women's DS and increased BMI; it is possible that women's DS is related to stigma associated with obesity rather than pointing to DS as a contributor to increased BMI. Additional research also is needed to address strategies related to coping and presentation of self to mitigate the health effects of exposure to discrimination (Brondolo et al., 2009). Though numerous cross-sectional studies show that immigrants' reported DS repeatedly triggers a cascade of physiological changes, more longitudinal research is needed to determine if these changes contribute, over the long term, to increased chronic disease. If this causal link is established, discrimination stress may ultimately be understood as a contributor to common health conditions among Latinos in the U.S., including abdominal obesity, type 2 diabetes, and cardiovascular disease.

Acknowledgments

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Table 1

Anthropometric, sociocultural, and health measures.[a,b]

Measure	Females (n = 86)	Males (n = 46)
Age (*years*)	35.9 (11.6)	38.7 (13.0)
Time in residence (*years*)	9.5 (6.9)[*]	13.5 (9.4)
Height (*cm*)	154.6 (6.6)[***]	165.1 (6.1)
Weight (*kg*)	70.5 (14.1)[*]	75.8 (14.1)
BMI (*kg/m²*)	29.6 (6.1)[*]	27.7 (4.1)
WC (*cm*)	90.3 (13.6)	92.3 (12.4)
SBP (*mm Hg*)	112.7 (15.3)[*]	118.3 (12.0)
DBP (*mm Hg*)	73.8 (9.3)	72.4 (9.0)
Glucose (*mg/dL*)	84.1 (18.0)	84.6 (21.0)

BMI: body mass index; WC: waist circumference; SBP: systolic blood pressure; DBP: diastolic blood pressure.

[a]All values are represented as means and standard deviations.

[b]Differences between females and males are statistically different at

[*]$p < 0.05$;

[***]$P < 0.001$.

Table 2

Prevalence of health conditions for Latinos in Oregon and the United States.

	Overweight (%) (BMI 25–29.9 kg/m²)	Obese (%) (BMI≥30 kg/m²)	WC (cm)	Diabetes (%) (>125 mg/dL)	Prediabetes (%) (100–125 mg/dL)	High Total Cholesterol (%) (≥240 mg/dL)	Prehypertension (SBP 120–139 or DBP 80–89 mmHg)
OR Men	44	30	92	6	4	0	33
OR Women	40	33	90	5	9	2	29
U.S. Men*	46[a]	26[a]	97[b]	10[a]		18[e]	41[b]
U.S. Women*	33[a]	29[a]	94[b]	11[a]		14[e]	20[b]
U.S. Adults*				15[c]	26[d]		

BMI: body mass index; WC: waist circumference; mg/dL: milligrams per deciliter. Data are from the following sources:

[a] National Health Interview Survey, Centers for Disease Control and Prevention (CDC);

[b] National Health and Nutritional Exam Survey, CDC;

[c] National Center for Health Statistics;

[d] National Center for Chronic Disease Prevention and Health Promotion, CDC;

[e] Office of Minority Health & Health Disparities, CDC.

* Note: all U.S. data are for Mexican origin adults (NCHS, NCCDPHP, NHANES, OMHD) or for Latino adults (NHIS).