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Self-Reported Discrimination and Health-Related Quality of Life Among Whites, Blacks, Mexicans and Central Americans

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Abstract This study investigates whether self-reported racial discrimination is related to poor health-related quality of life (HRQoL). Analyses focused on Whites (n = 52,571), Blacks (n = 4,343), Mexicans (n = 12,336), Central Americans (n = 1,504), Multi-ethnic Latinos (n = 1,102), and Other Latinos (n = 1,828) who participated in the 2003 and 2005 California Health Interview survey. Logistic and negative binomial regression was used to examine the association between HRQoL (assessed with the CDC unhealthy days measures) and self-reported racial discrimination. Discrimination was reported by 10% of Whites, 57% of Blacks, and 24–31% of the Latino groups. These reports were associated with increased number of unhealthy days, disability days, and poor self-rated health, even after, controlling for education and other factors. This association did not consistently vary by race/ethnicity. Racial discrimination may be a risk factor for poor HRQoL among diverse groups. Future research should examine the factors that may reduce potential exposure to racial discrimination.

Keywords Self-reported discrimination · Health-related quality of life · Whites · Blacks · Latinos

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Introduction

Studies find that self-reported discrimination is related to a variety of health problems. The goal of this paper is to examine whether discrimination is associated with poor quality of life among Blacks, Latinos, and Whites. Although the literature on discrimination and health is growing, particularly among Blacks, there is much less known about Latinos. An important limitation of past research on Latinos is aggregating multiple ethnic groups or focusing on one group. The current study builds the literature by focusing on large samples of Mexicans, Central Americans, and Other Latinos.

Discrimination may expose one to environmental hazards, injure a person's self-concept, and restrict socioeconomic position [1, 2]. Experiences with discrimination may be a stressor that influences health through physiological, psychological, and behavioral responses [3]. Consistent with this theory, studies find that reports of discrimination are related to injury, substance use, depression, and high blood pressure [4–17]. Given the diverse range of outcomes studied, it is not surprising that discrimination is also related to summary measures of well-being. Reports of discrimination have been associated with lowered self-rated health among Mexicans in California [18, 19], and global indicators of well-being among Blacks in Detroit [3]. Prospective studies have found that reports of discrimination were associated with health-related work limitations among Blacks, Latinos, and Whites among young adults across the United States (US) [20] and diminished self-rated health among Blacks in Detroit [21]. Similarly, self-reported discrimination has been inversely associated with good quality of life among adolescents in Spain [22].

Recent studies have employed the health-related quality of life (HRQoL) measures developed by the Centers for

Disease Control and Prevention (CDC), including self-rated health, unhealthy days, and activity limitation days. These CDC measures are consistent with the World Health Organization's definition of health and are part of the Institute of Medicine's twenty key indicators of health [23]. One study found the hypothesized associations between self-reported discrimination and HRQoL among Asians in California [24], while a second study found partial support for these associations among Blacks and Latinos in New York [15]. A third study found Whites, Blacks, and Latinos who reported discrimination had higher odds of having unhealthy days compared to those who did not report discrimination [25]. Yet, in the same study, reports of discrimination were also associated with poor self-rated health among Blacks and Whites, but not Latinos.

The findings for Latinos are not entirely consistent for all studies and outcomes. One reason is that estimates of self-rated health may be biased among Latinos, particularly when not controlling for immigration-related factors [26]. A second reason might be due to aggregation of heterogeneous Latino groups into one category. If one group is high on a characteristic while another is low on the same characteristic, the combined estimate will not be representative of either. Further, estimates may be weighted heavily in favor of the numerically largest group. A corollary is some studies have very small samples of certain Latino subgroups, precluding disaggregation.

In the present study, we examine how self-reported discrimination is associated with HRQoL among Whites, Blacks, and Latinos. A unique feature of this study includes the large sample of Central Americans, an understudied population [27, 28]. In 2005, there were 3 million Central Americans residing in the US, yet, they have not been included in many research studies [29, 30].

Methods

Sample

We used data from the California Health Interview Survey (CHIS), a random digit dial population-based telephone survey [31, 32]. We combine the 2003 and 2005 CHIS samples to increase the number of cases; other survey years did not include the measure of self-reported discrimination used in the present analyses. We focus on the White, Black, and Latino adult respondents, interviewed in English or Spanish. The overall response rate for adults was 33.5% (2003) and 26.9% (2005). Interviews conducted by proxy were excluded because they are not likely to be reliable estimates of self-reported discrimination.

Our analytic sample includes 52,571 Whites, 4,343 Blacks, 12,336 Mexicans, 1,504 Central Americans (744

from El Salvador, 430 from Guatemala, and 330 from Other Central American countries), 1,102 Multi-ethnic Latinos, and 1,828 Other Latinos (715 from Europe, 508 from South America, 274 from Puerto Rico, and 331 from other backgrounds). Multi-ethnic Latinos included individuals who identified with two or more Latino groups, such as Mexican and Salvadoran. We did not aggregate the Multi-ethnic Latinos with the Other Latino category because the former tends to be younger and less of an immigrant population than the latter.

Measures

Dependent Variables

The dependent variables were self-rated health, activity limitation days, and unhealthy days based on the CDC's measures of HRQoL [24, 33–35]. *Self-rated health* was measured by asking respondents, "would you say that in general your health is…." Respondents could indicate "excellent, very good, good, fair, or poor". Based on previous studies, responses were dichotomized as "excellent/very good/good" versus "fair/poor." [24, 35, 36]. *Activity limitation days* was measured by asking respondents, "during the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation," with responses ranging from 0–30 days. *Unhealthy days* was measured by asking respondents, "now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good" and, "now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good". Based on CDC recommendations, responses for these two questions were summed with the maximum limited to 30 days [24, 33–35].

Independent Variables

Self-reported discrimination was measured by asking respondents, "thinking about your race or ethnicity, how often have you felt treated badly or unfairly because of your race or ethnicity." [24]. Respondents could indicate "never, rarely, sometimes, often, or all of the time". Based on the distribution, responses were dichotomized as "never/rarely" versus "sometimes/often/all of the time".

Sociodemographic characteristics included age, gender, employment, education, percent life in the US, limited English proficiency, marital status, and income-poverty ratio. This ratio was calculated by dividing family income by the federal poverty level. These measures have been

associated with discrimination and quality of life among Latinos [18, 37]. Since the 2003 and 2005 CHIS were used, an indicator of the year was included to account for any historic changes during this period. To facilitate interpretation of the intercept, continuous variables were centered at their means.

Analytic Plan

Analyses began with simple descriptives and bivariate associations between HRQoL and independent variables.

Multivariate regression techniques were then employed with three models. The first model included race/ethnicity and the sociodemographic control variables. The second model added self-reported discrimination. The third model included the interaction between discrimination and race/ethnicity to investigate whether the effect of discrimination on HRQoL varied by group. Logistic regression was used for the binary measure of self-rated health. Negative binomial regression was used for the count measures of activity limitation days and unhealthy days. Analyses were weighted to account for the sampling design and to allow

Table 1 Participant characteristics, by race or ethnicity

	Non-Latino Whites (n = 52,571)	Non-Latino Blacks (n = 4,343)	Mexicans (n = 12,336)	Central Americans (n = 1,504)	Multi-ethnic Latinos (n = 1,102)	Other Latinos (n = 1,828)
Activity limitation days, mean (SE)	2.2 (0.0)	2.6 (0.2)[a]	1.8 (0.1)[a,b]	1.6 (0.1)[a,b]	2.5 (0.3)[c,d]	2.4 (0.2)[c,d]
Unhealthy days, mean (SE)	7.0 (0.1)	8.0 (0.2)[a]	7.0 (0.1)[b]	7.6 (0.3)	7.7 (0.4)	8.0 (0.3)[c]
Fair/poor health, %	13.3	22.0[a]	30.0[a,b]	34.7[a,b,c]	17.9[a,b,c,d]	17.7[a,b,c,d]
Discrimination, %	10.4	56.9[a]	28.1[a,b]	26.5[a,b]	30.8[a,b]	24.0[a,b,c,e]
Limited English proficiency, %	0.3	0.5	45.4[a,b]	51.1[a,b,c]	5.7[a,b,c,d]	10.1[a,b,c,d,e]
Female, %	51.2	54.2[a]	48.8[a,b]	50.5[b]	50.8	50.3[b]
Married, %	57.5	36.8[a]	53.5[a,b]	49.3[a,b,c]	45.2[a,b,c]	49.3[a,b,c]
% Life US		a	a,b	a,b,c	a,b,c,d	a,b,c,d,e
0–20	1.5	1.5	11.4	12.6	1.3	6.5
21–40	1.5	1.1	16.8	28.4	2.4	7.3
41–60	2.0	1.6	20.2	31.5	6.1	8.7
61–80	1.9	1.1	8.9	10.3	4.4	7.7
81–100	93.1	94.7	42.7	17.3	85.9	69.9
Currently employed, %	62.6	60.0[a]	63.3[b]	67.4[a,b]	66.7[a,b]	65.5[a,b]
Education		a	a,b	a,b,c	a,b,c,d	a,b,c,d,e
Less than 9th grade	1.48	2.37	28.3	35.2	5.4	5.7
Grades 9–11	4.44	7.93	18.7	12.5	11.2	9.3
High school graduate	24.51	30.75	27.3	22.2	30.7	24.8
Some college	16.86	20.75	10.5	11.1	20.1	18.5
Vocational school	2.76	3.3	2.3	2.9	3.5	3.0
AA/AS degree	8.57	10.62	4.4	4.5	11.6	8.5
BA/BS degree	23.93	15.43	6.1	7.8	12.3	18.2
Some grad. school	1.78	0.68	0.3	0.6	0.4	0.9
MA/MS degree	11.34	6.08	1.6	2.5	3.5	8.6
PhD or equivalent	4.33	2.09	0.4	0.7	1.3	2.5
Income-poverty ratio, mean (SE)	5.8 (0.0)	3.8 (0.1)[a]	2.3 (0.03)[a,b]	2.3 (0.07)[a,b]	4.0 (0.2)[a,c,d]	4.2 (0.1)[a,b,c,d]
Age, mean (SE)	48.5 (0.1)	44.0 (0.3)[a]	37.5 (0.1)[a,b]	38.8 (0.4)[a,b,c]	37.1 (0.6)[a,b]	43.7 (0.5)[a,c,d,e]

California health interview survey, 2003–2005 (N = 73,684)

Estimates are weighted to account for the sampling design

[a] Statistically different from Whites

[b] Statistically different from Blacks

[c] Statistically different from Mexicans

[d] Statistically different from Central Americans

[e] Statistically different from Multi-ethnic Latinos

estimates to be representative of the California adult population using the *svy* procedures in Stata (v11) software [38].

Results

Table 1 describes the participant's characteristics by race/ethnicity. There was no uniform pattern with regards to the health measures. When considering unhealthy days, Blacks and Other Latinos reported the most days. When considering activity limitation days, Blacks again reported the most days. Yet, when considering self-rated health, Central Americans and Mexicans reported the most fair/poor health.

Reports of discrimination, however, showed a clear gradient. Blacks (56.9%) reported the most discrimination and Whites (10.4%) reported the least. Latinos were intermediate. Central Americans, Mexicans, and Multi-ethnic Latinos did not statistically differ from one another (26.5–30.8%). Other Latinos, however, were significantly lower (24.0%).

Certain sociodemographic characteristics also varied by race/ethnicity. Whites had the highest levels of education and the most economic resources; Latinos were overall the youngest and most likely to be immigrants; and Blacks had the lowest employment rate. Among Latinos, Central Americans and Mexicans were relatively similar, although the latter fared slightly worse on some indicators. Central Americans and Mexicans also fared worse overall than Multi-ethnic Latinos and Other Latinos, who were relatively similar to one another.

Table 2 presents the multivariate analyses for self-rated health. Model 1 shows Blacks and Latinos were significantly more likely to have fair/poor health compared to Whites, adjusting for covariates. For instance, Central Americans have an 83% ($e^{0.604} = 1.83$) higher odds of fair/poor health than Whites. Model 2 shows persons who report discrimination have a significantly higher (62%) odds of fair/poor health compared to those who do not report discrimination. Further, the coefficients for the racial/ethnic groups shrank and remained significant except for Other Latinos. Model 3 shows the interaction between discrimination and race/ethnicity is significant for Blacks

Table 2 Association between self-reported discrimination and poor self-rated health

	Model 1		Model 2		Model 3	
	Beta	(SE)	Beta	(SE)	Beta	(SE)
Race or ethnicity						
White	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Black	0.438	(0.059)***	0.228	(0.064)***	0.429	(0.089)***
Mexican	0.387	(0.049)***	0.309	(0.050)***	0.327	(0.057)***
Central American	0.604	(0.100)***	0.533	(0.101)***	0.491	(0.118)***
Multi-ethnic Latino	0.319	(0.098)**	0.231	(0.097)*	0.254	(0.138)
Other Latino	0.173	(0.079)*	0.110	(0.081)	0.211	(0.094)*
Discrimination						
No Discrimination	–	–			Ref.	Ref.
Discrimination	–	–	0.480	(0.041)***	0.589	(0.055)***
Interaction						
White*discrimination	–	–	–	–	Ref.	Ref.
Black*discrimination	–	–	–	–	−0.422	(0.115)***
Mexican*discrimination	–	–	–	–	−0.110	(0.081)
Central American*discrimination	–	–	–	–	0.101	(0.177)
Multi-ethnic Latino*discrimination	–	–	–	–	−0.124	(0.236)
Other Latino*discrimination	–	–	–	–	−0.426	(0.185)*

California health interview survey, 2003–2005 (N = 73,684)

Estimates are weighted to account for the sampling design

Models use logistic regression

All estimates adjust for age, gender, employment, education, poverty, marital status, survey year, percent of life in the US, and limited English proficiency

Beta unstandardized coefficient; *SE* robust standard error

Ref. reference category

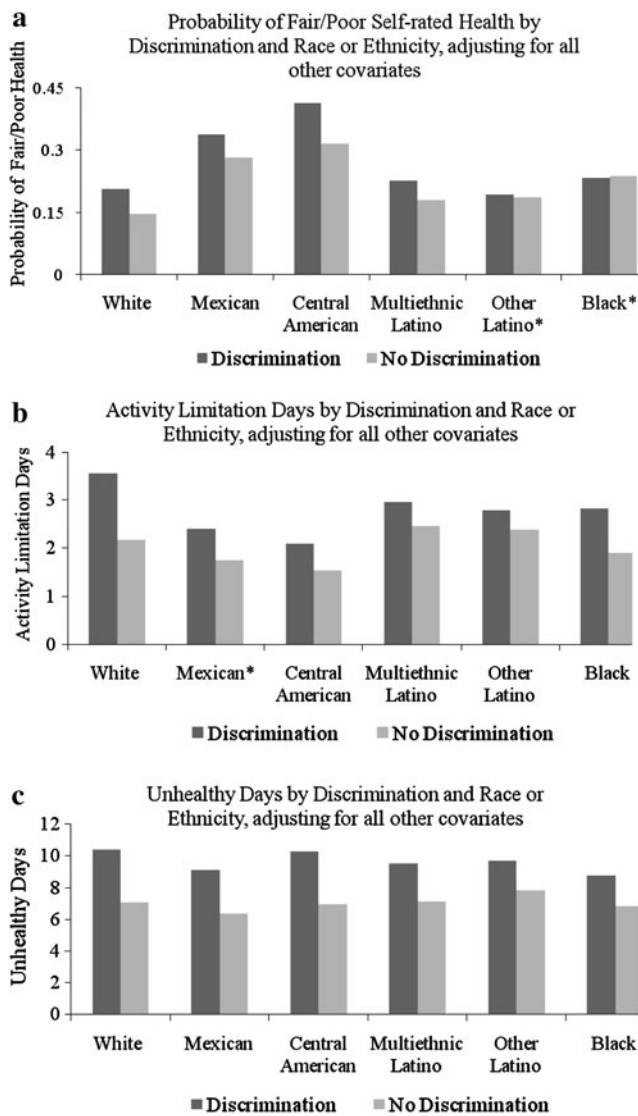* $P \leq 0.05$; ** $P \leq 0.01$; *** $P \leq 0.001$

Fig. 1 Association between discrimination and quality of life, by race or ethnicity. CHIS 2003–2005

and Other Latinos for self-rated health, adjusting for other covariates. This interaction is clarified in Fig. 1a and indicates discrimination is a significant correlate of fair/poor health for all groups except Blacks and Other Latinos.

Table 3 provides the multivariate analyses for activity limitation days. Model 1 shows Blacks have significantly fewer activity limitation days than Whites. As a group, Latinos did not differ from each other or from Whites. Yet in Model 2, when discrimination is accounted for, Blacks, Mexicans, and Central Americans show significantly fewer activity limitation days than Whites. Additionally, discrimination is significantly associated with activity limitation days: individuals reporting discrimination are expected to have an additional 1.52 days per month ($e^{0.421} = 1.52$) compared to those who do not report discrimination. Model 3 shows the interaction between

discrimination and race/ethnicity is significant for Mexicans. Figure 1b shows this interaction and suggests the magnitude of effect for discrimination among Mexicans is lower than the effect among Whites.

Table 4 shows the multivariate analyses for unhealthy days. Model 1 indicates Mexicans and Other Latinos are the only groups significantly different from Whites. In Model 2, once discrimination is included, Mexicans remain significantly different from Whites. Also, Blacks now become statistically different from Whites. Additionally, the main effect of discrimination is statistically significant. Individuals who report discrimination are expected to have an additional 1.46 ($e^{0.378} = 1.46$) unhealthy days per month compared to those who do not report discrimination. In Model 3 the interaction between discrimination and race/ethnicity is not significant for any groups for unhealthy days, as shown in Fig. 1c.

As a sensitivity check, multivariate analyses were stratified by race/ethnicity (not shown), revealing substantively similar findings. In supplemental analyses, we explored potential interactions between discrimination and nativity and years in the US, but did not find consistent effect moderation.

Discussion

Our results show self-reported discrimination was associated with poorer HRQoL among a representative sample of Blacks, Whites, and Latinos in California. Overall, our analyses suggest that individuals reporting discrimination are expected to have an extra 18 activity limitation days per year, 17 unhealthy days per year, and a 61% higher odds of fair/poor health compared to persons not reporting discrimination. These findings are comparable to a study conducted among Asians in California using a similar modeling strategy; for instance, South Asians reporting discrimination had an extra 14.4 activity limitation days per year [24]. The findings are also comparable to other studies using slightly different measures, which find reports of discrimination are related to poor self-rated health and higher likelihood of unhealthy days among Blacks and Latinos [3, 15, 18, 19, 21, 25].

As expected, we also found that groups varied in reporting of discrimination. Almost 3 in 5 Blacks reported discrimination and about 1 in 4 Latinos reported discrimination, compared to only 1 in 10 Whites. Some of these differences between Blacks and Latinos in the reporting of discrimination may be related to immigration [11]. With increasing duration in the US among immigrant Blacks and Latinos comes increasing exposure to racial bias [39, 40]. Within Latinos, reporting levels were fairly similar and only slightly lower reporting among Other Latinos. Our

Table 3 associations between self-reported discrimination and activity limitation days

	Model 1		Model 2		Model 3	
	Beta	(SE)	Beta	(SE)	Beta	(SE)
Race or ethnicity						
White	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Black	−0.107	(0.046)*	−0.2564	0.06209***	−0.282	(0.089)**
Mexican	−0.142	(0.078)	−0.1783	0.04589***	−0.141	(0.050)**
Central American	0.119	(0.104)	−0.2023	0.08058*	−0.156	(0.100)
Multi-ethnic Latino	0.119	(0.131)	0.05395	0.14113	0.119	(0.187)
Other Latino	−0.057	(0.061)	0.07921	0.10481	0.144	(0.115)
Discrimination						
No discrimination	–	–	Ref.	Ref.	Ref.	Ref.
Discrimination	–	–	0.42129	0.03963***	0.523	(0.045)***
Interaction						
White*discrimination	–	–	–	–	Ref.	Ref.
Black*discrimination	–	–	–	–	−0.037	(0.114)
Mexican*discrimination	–	–	–	–	−0.175	(0.079)*
Central American*discrimination	–	–	–	–	−0.217	(0.155)
Multi-ethnic Latino*discrimination	–	–	–	–	−0.277	(0.255)
Other Latino*discrimination	–	–	–	–	−0.331	(0.184)

California health interview survey, 2003–2005 (N = 73,684)

Estimates are weighted to account for the sampling design

Models use negative binomial regression

All estimates adjust for age, gender, employment, education, poverty, marital status, survey year, percent of life in the US, and limited English proficiency

Beta unstandardized coefficient; *SE* robust standard error

Ref. reference category

* $P \leq 0.05$; ** $P \leq 0.01$; *** $P \leq 0.001$

findings differ from those of Perez and colleagues (2008), who found differences in reporting of discrimination between Puerto Ricans, Cubans, and Mexicans [37]. Our studies are not fully comparable, however, given our study is based in California while theirs is based across the nation and also that the two studies did not examine the same ethnic groups.

These reports of discrimination were significantly related to all three measures of health-related quality of life, even after accounting for poverty, limited English proficiency and other sociodemographic factors. Further, discrimination was not only directly associated with poor health-related quality of life, but also influenced inferences about racial/ethnic differences in these outcomes. In general, differences between racial/ethnic minorities and Whites attenuate after including discrimination. Blacks had more unhealthy days (8 days) compared to Whites (7 days) when not adjusting for any factors. Once we adjusted for poverty and other sociodemographics, the Black-White disparity was no longer statistically significant. However, once we included discrimination, Blacks began to have a

significant advantage over Whites (i.e. *fewer* unhealthy days). Williams and colleagues reported a similar finding: no Black-White disparities existed in well-being or psychological distress when adjusting for socioeconomic status [3]. However, once they included discrimination, Blacks began to show improved well-being and less distress than Whites. Williams and colleagues hypothesized Blacks may be better able to cope with discrimination than Whites. Future studies should explore coping strategies and resiliency which may enable racial/ethnic minorities to be better suited to cope with discrimination than Whites [3].

Taken together, these findings suggest two important observations. First, self-reported discrimination is related to self-reported health. Second, and more intriguing, they also suggest that for unhealthy days and activity limitation days, racial/ethnic minorities may be as healthy as Whites if it were not for discrimination. Of course, these ideas should be seen as preliminary given the limitations of our data (discussed below), but they do provide directions for future research.

Table 4 Associations between self-reported discrimination and unhealthy days

	Model 1		Model 2		Model 3	
	Beta	(SE)	Beta	(SE)	Beta	(SE)
Race or ethnicity						
White	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Black	−0.0316	0.02849	−0.2057	0.03113***	−0.169	(0.044)***
Mexican	−0.1027	0.02375***	−0.1739	0.02603***	−0.177	(0.030)***
Central American	0.04665	0.05076	−0.0212	0.05099	−0.031	(0.060)
Multi-ethnic Latino	0.01102	0.05449	−0.0604	0.05436	−0.041	(0.069)
Other Latino	0.10945	0.04229*	0.06649	0.04313	0.102	(0.050)*
Discrimination					Beta	(SE)
No discrimination	–	–	Ref.	Ref.	Ref.	Ref.
Discrimination	–	–	0.37775	0.02008***	0.394	(0.023)***
Interaction						
White*discrimination	–	–	–	–	Ref.	Ref.
Black*discrimination	–	–	–	–	−0.077	(0.063)
Mexican*discrimination	–	–	–	–	0.000	(0.041)
Central American*discrimination	–	–	–	–	0.027	(0.097)
Multi-ethnic Latino*discrimination	–	–	–	–	−0.073	(0.121)
Other Latino*discrimination	–	–	–	–	−0.163	(0.097)

California health interview survey, 2003–2005 (N = 73,684)

Estimates are weighted to account for the sampling design

Models use negative binomial regression

All estimates adjust for age, gender, employment, education, poverty, marital status, survey year, percent of life in the US, and limited English proficiency

Beta unstandardized coefficient; *SE* robust standard error

Ref. reference category

* $P \leq 0.05$; ** $P \leq 0.01$; *** $P \leq 0.001$

Although groups varied in initial health status and in reporting of discrimination, groups did not consistently differ in the effect of self-reported discrimination on health, a finding seen in other studies [3]. These findings imply discrimination may be equally toxic to all persons. However, even if there are no racial/ethnic differences in reactivity to self-reported discrimination, it is important to recall Blacks and Latinos reported more discrimination than Whites. Hence, at the population level, the health "burden" of discrimination falls disproportionately onto racial/ethnic minorities.

One possibly anomalous finding was discrimination was not related to self-rated health among Blacks. Other studies using the Everyday Discrimination scale have found such an association [3, 21]. Our finding may result from chance, or it may be that our single-item measure of discrimination was not sensitive enough for this outcome among this population. Further replication may be warranted.

Our findings should be seen in light of several caveats. First, as we used cross sectional data, the relationship between discrimination and quality of life cannot be deemed causal.

Second, our data are based on self-reports. It is possible that unmeasured factors, such as dispositional negativity, may increase the reporting of both discrimination and poor health. The question on self-rated health may have limited validity among Latinos; immigrant Latinos report worse self-rated health than US born Latinos [7, 26, 41, 42]. This difference is thought to be due to a discrepancy in reporting rather than indicative of actual health, as Latino immigrants tend to be healthier than US born Latinos. Our findings are consistent with this literature: both Mexicans and Central Americans, which included a larger percentage of immigrants than Multi-ethnic Latinos or Other Latinos, reported worse self-rated health. To account for this discrepancy, we controlled for immigration factors per the recommendations by Finch and colleagues [26]. Future research should consider the cross-cultural adaption of quality of life measures [43].

Third, given the low response rate our findings run the risk of only being reflective of respondents rather than the California adult population. CHIS response rates are similar to other telephone surveys in California, including the 2005 California Behavioral Risk Factor Surveillance System Survey [44]. The demographics of CHIS respondents are

consistent with those from the Census Bureau [44]. The 2005–2007 American Community Survey shows 61% of Mexicans and 67% of Central Americans are currently employed; CHIS shows 63 and 67%, respectively. A particularly relevant concern for our study is that telephone surveys may not represent low-income and undocumented immigrants. However, Ortega and colleagues found that after weights were applied using 2005 CHIS, the total number of undocumented residents was consistent with estimates from the Pew Hispanic Center of undocumented residents in California [45, 46]. Thus, our use of sampling weights helps temper concerns that our analyses are unrepresentative of these groups.

Fourth, the composition of Multi-ethnic Latinos and Other Latinos may have limited applicability because they contain a heterogeneous mix of respondents. Future research, particularly in California, should include oversampling for Puerto Ricans and other subgroups to enable statistically reliable analyses.

These limitations are balanced by several strengths. Our study includes large samples of diverse ethnic groups, including the understudied population of Central Americans. Moreover, some prior studies including multiple racial/ethnic groups do not directly test for interactions between discrimination and racial/ethnic group (and instead, mainly look at coefficients in group stratified analyses). The testing of group differences requires explicit testing of effect modification as we have done. Further, we are among the few studies using the CDC measures of HRQoL. We believe future studies of discrimination should use these CDC measures as they are part of the twenty key indicators of health recommended by the Institute of Medicine [23].

In closing, this study finds that self-reported discrimination is associated with diminished well-being. Our calculations suggest individuals reporting discrimination have over two and a half additional weeks of unhealthy days and limited activity days annually. Future studies could extend this work by investigating whether these days are also related to other social and health outcomes. Further, it would be important to evaluate whether our findings are generalizable to other settings, and to investigate the mediating mechanisms. For instance, it would be worth exploring whether health care, substance use, or job strain mediates the associations [47–50]. Finally, it will be important to evaluate the individual-level and societal resources that may reduce and protect against discrimination.

References

1. Kessler RC, Mickelson KD, Williams DR. The prevalence distribution, and mental health correlates of perceived discrimination in the United States. J Health Soc Behav. 1999;40(3):208–30.
2. Pavalko EK, Mossakowski KN, Hamilton VJ. Does perceived discrimination affect health? Longitudinal relationships between work discrimination and women's physical and emotional health. J Health Soc Behav. 2003;44(1):18–33.
3. Williams DR, et al. Racial differences in physical and mental health: socio-economic status, stress and discrimination. J Health Psychol. 1997;2(3):335–51.
4. Bhui K, et al. Racial/ethnic discrimination and common mental disorders among workers: findings from the EMPIRIC Study of ethnic minority groups in the United Kingdom. Am J Public Health. 2005;95(3):496–501.
5. Caughy MOB, O'Campo PJ, Muntaner C. Experiences of racism among African American parents and the mental health of their preschool-aged children. Am J Public Health. 2004;94(12):2118–24.
6. Finch BK, et al. The role of discrimination and acculturative stress in the physical health of mexican-origin adults. Hisp J Behav Sci. 2001;23(4):399–429.
7. Finch BK, Kolody B, Vega WA. Perceived discrimination and depression among Mexican-origin adults in California. J Health Soc Behav. 2000;41(3):295–313.
8. Fischer AR, Shaw CM. African Americans' mental health and perceptions of racist discrimination: the moderating effects of racial socialization experiences and self-esteem. J Counsel Psychol. 1999;46(3):395–407.
9. Gee GC. A multilevel analysis of the relationship between institutional and individual racial discrimination and health status. Am J Public Health. 2002;92(4):615–23.
10. Gee GC, et al. Disentangling the effects of racial and weight discrimination on body mass index and obesity among Asian Americans. Am J Public Health. 2008;98(3):493–500.
11. Gee GC, et al. Self-reported discrimination and mental health status among African descendants, Mexican Americans, and other Latinos in the New Hampshire REACH 2010 initiative: the added dimension of immigration. Am J Public Health. 2006;96(10):1821–8.
12. Hogue CJR, et al. Minority health in America: findings and policy implications from the Commonwealth Fund minority health survey, vol. xviii. Baltimore, MD: Johns Hopkins University Press; 2000.
13. Noh S, Kaspar V. Perceived discrimination and depression: moderating effects of coping, acculturation, and ethnic support. Am J Public Health. 2003;93(2):232–8.
14. Schulz A, et al. Unfair treatment, neighborhood effects, and mental health in the Detroit metropolitan area. J Health Soc Behav. 2000;41(3):314–32.
15. Stuber J, et al. The association between multiple domains of discrimination and self-assessed health: a multilevel analysis of Latinos and blacks in four low-income New York City neighborhoods. Health Serv Res. 2003;38(6 Pt 2):1735–59.
16. Whitbeck LB, et al. Perceived discrimination, traditional practices, and depressive symptoms among American Indians in the upper Midwest. J Health Soc Behav. 2002;43(4):400–18.
17. Williams DR, Williams-Morris R. Racism and mental health: the African American experience. Ethn Health. 2000;5(3–4):243–68.
18. Finch BK, Vega WA. Acculturation Stress, social support, and self-rated health among Latinos in California. J Immigr Health. 2003;5(3):109–17.

19. Flores E, et al. Perceived discrimination, perceived stress, and mental and physical health among Mexican-origin adults. Hisp J Behav Sci. 2008;30(4):401–24.

20. Gee G, Walsemann K. Does health predict the reporting of racial discrimination or do reports of discrimination predict health? Findings from the National Longitudinal Study of Youth. Soc Sci Med. 2009;68(9):1676–84.

21. Schulz AJ, et al. Discrimination, symptoms of depression, and self-rated health among African American Women in Detroit: results from a longitudinal analysis. Am J Public Health. 2006;96(7):1265–70.

22. Pantzer K, et al. Health related quality of life in immigrants and native school aged adolescents in Spain. J Epidemiol Community Health. 2006;60(8):694–8.

23. Institute of Medicine. State of the USA health indicators. Letter report. Washington, DC: The National Academies Press; 2009.

24. Gee GC, Ponce N. Associations between racial discrimination, limited English proficiency, and health-related quality of life among 6 Asian ethnic groups in California. Am J Public Health. 2010;100(5):888–95.

25. Fujishiro K. Is perceived racial privilege associated with health? Findings from the behavioral risk factor surveillance system. Soc Sci Med. 2009;68(5):840–4.

26. Finch BK, et al. Validity of self-rated health among Latino(a)s. Am J Epidemiol. 2002;155(8):755–9.

27. Barrett B. Integrated local health systems in Central America. Soc Sci Med. 1996;43(1):71–82.

28. Cervantes RC, de Snyder VNS, Padilla AM. Posttraumatic stress in immigrants from Central America and Mexico. Hosp Community Psychiatry. 1989;40(6):615–9.

29. Alegría M, et al. Understanding differences in past year psychiatric disorders for Latinos living in the US. Soc Sci Med. 2007;65(2):214–30.

30. Cook B, et al. Pathways and correlates connecting Latinos' mental health with exposure to the United States. Am J Public Health. 2009;99(12):2247–54.

31. Brown ER, et al. Community-based participatory research in the California health interview survey. Prev Chronic Dis. 2005;2(4):A03.

32. Ponce NA, et al. The California health interview survey 2001: translation of a major survey for California's multiethnic population. Public Health Rep. 2004;119(4):388–95.

33. Hennessy CH, et al. Measuring health-related quality of life for public health surveillance. Public Health Rep. 1994;109(5):665–72.

34. Preamble to the Constitution of the World Health Organization as Adopted by the International Health Conference, New York, June 19–22, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. Geneva, Switzerland: World Health Organization; 1948.

35. Zahran HS, et al. Health-related quality of life surveillance–United States, 1993–2002. MMWR Surveill Summ. 2005;54(4):1–35.

36. Manor O, Matthews S, Power C. Dichotomous or categorical response? Analysing self-rated health and lifetime social class. Int J Epidemiol. 2000;29(1):149–57.

37. Pérez DJ, Fortuna L, and Alegría M. Prevalence and correlates of everyday discrimination among US Latinos. J Community Psychol. 2008;421–433. doi:10.1002/jcop.20221.

38. StataCorp. Stata statistical software: release 11. College Station, TX: StataCorp LP; 2009.

39. Portes A, Bach RL. Latin journey: Cuban and Mexican immigrants in the United States, vol. xxi. Berkeley: University of California Press; 1985.

40. Waters MC. Black identities: West Indian immigrant dreams and American realities. New York and Cambridge: Mass.: Russell Sage Foundation and Harvard University Press; 1999.

41. Shetterly SM, et al. Self-rated health among Hispanic versus non-Hispanic white adults: the San Luis Valley Health and Aging Study. Am J Public Health. 1996;86(12):1798–801.

42. Vega WA, Amaro H. Latino outlook: good health, uncertain prognosis. Annu Rev Public Health. 1994;15(1):39–67.

43. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. J Clin Epidemiol. 1993;46(12):1417–32.

44. California Health Interview Survey. CHIS. Methodology series: report 4—response rates. Los Angeles, CA: UCLA Center for Health Policy Research, 2007. Available at: http://www.chis.ucla.edu/pdf/CHIS2005_method4.pdf (2005). Accessed 5 May 2010.

45. Ortega AN, et al. Documentation status and parental concerns about development in young US children of Mexican origin. Acad Pediatr. 2009;9(4):278–82.

46. Passel J, Estimates of the unauthorized migrant population for States based on the March 2005 CPS. Washington, DC: Pew Hispanic Center; April 26. Available at: http://pewhispanic.org/files/factsheets/17.pdf (2006). Accessed 2 Dec 2010.

47. Kulis S, Marsiglia F, Nieri T. Perceived ethnic discrimination versus acculturation stress: influences on substance use among Latino youth in the Southwest. J Health Soc Behav. 2009;50(4):443–59.

48. Martin J, Tuch S, Roman P. Problem drinking patterns among African Americans: the impacts of reports of discrimination, perceptions of prejudice, and "risky" coping strategies. J Health Soc Behav. 2003;44(3):408–25.

49. Okamoto J, et al. Perceived discrimination and substance use among Latino adolescents. Am J Health Behav. 2009;33(6):718–27.

50. Pérez D, Sribney W, Rodríguez M. Perceived discrimination and self-reported quality of care among Latinos in the United States. J Gen Intern Med. 2009;24(Suppl 3):548–54.