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Racial Discrimination and Physical Activity Among Low Income—Housing Residents

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Abstract

Background—While discrimination has been identified as a potential determinant of existing racial/ethnic health disparities, no studies have investigated whether racial discrimination contributes to disparities in physical activity.

Purpose—The primary aim of the current study was to examine the association between interpersonal racial discrimination and physical activity.

Methods—Baseline data were collected during 2004–2005 among a predominately black and Hispanic sample of adult residents living in 12 low income–housing sites in Boston, Massachusetts ($n=1055$). Residents reported experiences of lifetime racial discrimination during interview-administered surveys and wore a pedometer for 5 days to measure physical activity. For analyses, performed in 2009, linear regression models with a cluster design were conducted to predict physical activity, measured as steps per day.

Results—Nearly 48% of participants reported ever experiencing racial discrimination, and discrimination was most commonly experienced on the street or in a public setting. No association was found between discrimination and physical activity, when examined in bivariate, multivariable, or race-stratified models.

Conclusions—The current results indicate that self-reported racial discrimination is not a key determinant of physical activity among residents living in lower-income housing. However, additional research is warranted to address current limitations of this study.

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Introduction

The association between physical activity and reduced risk of chronic disease morbidity and mortality has been well documented.¹ Despite some improvements,² over half of U.S. adults do not meet current recommendations for physical activity, and marked disparities persist by socioeconomic position and race/ethnicity.^{2–5}

Racial discrimination has emerged as a determinant of racial/ethnic health disparities for a number of health outcomes.^{6–9} Interpersonal exposure to racial discrimination is also associated with a number of harmful health-related behaviors, including alcohol use, smoking, illicit drug use,^{10–14} and poorer adherence to medical recommendations.^{15–19} Research is warranted to determine whether discrimination affects other health behaviors, including physical activity.⁸

Few studies have examined the association between stress and physical activity,^{5,20–22} with none examining the association between discrimination and physical activity. In light of this gap, an exploration was made of the association between racial discrimination and physical activity among residents living in lower-income subsidized housing communities in Boston, Massachusetts. Based on research demonstrating the harmful health impact of discrimination, particularly for U.S. blacks,^{8,9,23–25} it was hypothesized that residents who reported discrimination would be less active than residents who reported no discrimination, and that this association would be strongest among blacks.

Methods

Study design and Sample

Baseline data were collected in 2004–2005 from a cluster RCT of a colorectal cancer prevention intervention in twelve low income–housing communities (Boston, Massachusetts). Detailed study information is provided elsewhere.^{26,27}

Baseline surveys were completed by 1,554 participants with an overall response rate of 53% (34% to 92% across sites). These analyses were conducted among residents who were ambulatory, provided pedometer data, and completed the full baseline survey. Residents who did not have the following items were excluded: complete pedometer data ($n=374$), race/ethnicity data in the black, Hispanic, or white categories ($n=47$), complete racial discrimination data ($n=78$), with a final subsample of 1055 residents.

Survey and Measures

All participants: (1) provided informed consent; (2) completed an interviewer-administered survey in English or Spanish; (3) received a \$25 grocery store gift card as an incentive.

Physical activity was measured by pedometers (Yamax SW200). The pedometer protocol has been previously described in full detail.²⁸ Participants wore pedometers for 5 days, except when bathing, showering, swimming, and sleeping. Physical activity was treated as a continuous outcome, defined as the average number of steps/day (steps/d).

Racial Discrimination was assessed using an adapted version of Krieger's Experiences of Discrimination measure. The full instrument was validated among a sample of black, Latino and white working class adults in Greater Boston.^{29–31} The measure was abbreviated due to space limitations and to reduce response burden. Participants were asked: 'Have you ever felt discriminated against, been kept from doing something, been hassled, or been made to feel inferior in these situations because of your race, ethnicity or color: (1) getting a job; (2) at work; (3) getting housing; (4) getting medical care; or (5) on the street or in a public setting?' Item

response options were: Never; Once; 2–3 times; or 4 or more times. Over half of participants reported no discrimination, with broader categories of discrimination having restricted sample sizes and variability, thus responses were dichotomized as ‘ever’ versus ‘never’ experienced discrimination.

Sociodemographics and Covariates—Participants self-reported race/ethnicity, categorized here as black, white, or Hispanic. Nativity was categorized as ‘Born in the U.S.,’ ‘Born in Puerto Rico,’ or ‘Born outside the U.S./Puerto Rico’ (due to the large number of Puerto Ricans). Poverty level (at/below or above) was based on the 2005 Federal Poverty Guidelines.³² Gender, age, employment, education, and language were measured using standard demographic questions, and BMI was calculated from height/weight.

Statistical Analyses—All analyses used resident-level data, accounting for the complex cluster sampling design, with data weighted up to the population size within each housing site (weighted $n=1546$). Sociodemographic characteristics were analyzed, using chi-square tests to determine differences in discrimination. Missing BMI data were imputed using a single stage linear regression model with independent variables weight, gender, age, and nativity, due to missing height data ($n=96$).

Age-adjusted bivariate models predicting steps/d were conducted. A multivariable linear regression model was used to examine the association between discrimination and steps/d, including significant covariates at $p=.15$. Models stratified by race/ethnicity were also conducted. Analyses were done during the spring of 2009, using SUDAAN Version 9.01 and SAS Version 9.1 statistical software for clustered data.

Results

Descriptive Analyses

Participants were predominately (94%) racial/ethnic minorities, born in the U.S. or Puerto Rico (55.3% and 23.9% respectively), female (73.9%), and with no college-level coursework (65%) (mean age=47.9 years) (see Table 1). The mean BMI was $30.2 \text{ kg}\cdot\text{m}^{-2}$, with an average of 5711.4 steps per day (range: 500 – 20,000 steps/d). Nearly 48% of the sample reported ever experiencing racial discrimination, most commonly ‘on the street or in a public setting’ (28.6%), ‘at work’ (24.9%), and ‘getting a job’ (21.4%), and less commonly in ‘getting housing’ (13.7%) and ‘getting medical care’ (8.5%). There were significant differences in experiencing racial discrimination by race/ethnicity ($p=.0003$), gender ($p=.03$), age ($p=.0083$), education ($p=.0002$), native language ($p=.0005$), and nativity ($p=.0005$) (see Table 1).

Discrimination and Steps/d

Significant predictors of steps/d in bivariate age-adjusted models included employment, education, gender, race/ethnicity, age, and BMI (Table 2). There was no main effect association between discrimination and steps/d in bivariate age-adjusted analyses ($p=.63$; $\beta=-115.2$) or in multivariable analyses ($p=.58$; $\beta=-127.6$), controlling for age, BMI, gender, employment, and race/ethnicity (Table 2). This association was examined in race/ethnicity-stratified bivariate and multivariable models, finding nonsignificant associations among blacks ($p=.15$; $\beta=-462.0$), Hispanics ($p=.74$; $\beta=118.2$), and whites ($p=.23$; $\beta=1145.5$), controlling for age, BMI, gender, and employment (data not shown).

Discussion

In this study of lower income–housing residents, racial discrimination was not associated with physical activity when examined among the full sample or separately by race/ethnicity.

However, patterns of discrimination were consistent with previous findings from the literature, 9,23–25,31,33,34 with residents who were black, male, aged <35 years, more educated, English-speaking, or U.S.-born reporting a higher prevalence of experiencing racial discrimination.

These findings should be considered in light of study limitations, including the cross-sectional nature of analyses. The response rate for this study was lower than desired, but is consistent with other community-based studies.^{35,36} Findings are generalizable to only ambulatory residents of urban, lower-income housing in the U.S.. Underestimation of the prevalence of discrimination is possible due to use of an abbreviated measure. The experience of discrimination is complex, and future studies are also needed to investigate how other forms of discrimination (e.g., institutional) contribute to racial/ethnic disparities in physical activity.^{6,8,37–40} For example, residential segregation may be an important mechanism through which institutional discrimination influences physical activity, whereby racial/ethnic minorities are more likely to live in relatively homogenous and more disadvantaged neighborhoods with fewer resources (e.g., access to safe parks and physical activity facilities) that support physical activity.³⁸

This study has a number of strengths. To our knowledge, it is the first to examine the association between racial discrimination and physical activity, conducted among a large, randomly selected sample of low-income, predominately Hispanic and black adults. The approach taken here for measuring physical activity has been recommended for measuring steps accumulated through nonleisure activities,^{28,41,42} and provides a valid and reliable method for accurately measuring physical activity.⁴³

Conclusion

The association between racial discrimination and physical activity warrants further research among other populations and contexts, particularly in light of the population disparities in this potentially modifiable behavior.

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Table 1

Sociodemographic Characteristics of the Sample Organized by Prevalence of Self-reported Racial Discrimination
(*n*=1055 unweighted; 1546 weighted)

	<i>n</i> (column %)	Discrimination (Ever) <i>n</i> (%)	Discrimination (Never) <i>n</i> (%)
Overall:	1055 unweighted 1546 weighted	520 unweighted 734 weighted (47.5%)	535 unweighted 812 weighted (52.5%)
Gender [*]			
Male	403 (26.1%)	214 (53.2%)	189 (46.8%)
Female	1143 (73.9%)	520 (45.5%)	623 (54.5%)
Employment Status			
Work Full time	392 (25.4%)	193 (49.2%)	199 (50.8%)
Work Part time	247 (15.9%)	128 (51.8%)	119 (48.2%)
Disabled	303 (19.6%)	125 (41.4%)	178 (58.6%)
Not working	604 (39.1%)	288 (47.7%)	316 (52.3%)
Poverty Status			
At/Below Poverty Line	755 (53.7%)	345 (45.7%)	410 (54.3%)
Above Poverty Line	649 (46.3%)	328 (50.5%)	321 (49.5%)
Education ^{***}			
<High School	564 (36.6%)	209 (37.1%)	355 (62.9%)
Completed HS/Voc	439 (28.4%)	209 (47.6%)	230 (52.4%)
At least Some College +	541 (35.0%)	315 (58.2%)	226 (41.8%)
Nativity ^{***}			
Born in U.S.	854 (55.3%)	458 (53.6%)	396 (46.4%)
Born in Puerto Rico	370 (23.9%)	136 (36.6%)	234 (63.4%)
Born outside U.S./PR	320 (20.8%)	140 (43.7%)	180 (56.3%)
English 1st Language ^{***}			
Yes	855 (55.3%)	458 (53.6%)	397 (46.4%)
No	691 (44.7%)	276 (39.9%)	415 (60.1%)
Race/Ethnicity ^{***}			
Hispanic	680 (43.9%)	275 (40.4%)	405 (59.6%)
Black	785 (50.8%)	435 (55.5%)	350 (44.5%)
White	81 (5.3%)	24 (30.0%)	57 (70.0%)
Age ^{**}			
<35	375 (24.2%)	218 (58.0%)	157 (42.0%)
35–49	431 (27.9%)	195 (45.2%)	236 (54.8%)
50–64	496 (32.1%)	217 (43.8%)	279 (56.2%)
65+	244 (15.8%)	104 (42.8%)	140 (57.2%)
Steps/day, M (SE)	5711.4 (118)	5772.6 (165)	5655.9 (170)
BMI, M (SE)	30.2 (.21)	30.0 (.29)	30.4 (.29)

Note: Sample sizes are all weighted unless otherwise noted and may differ slightly due to missing data. Differences in reported discrimination were analyzed using chi-square tests and are significant at the following levels:

*
 $p \leq .05$;

**
 $p \leq .01$;

 $p \leq .001$.

Table 2

Bivariate and Multivariable Associations between Racial Discrimination, Sociodemographic Factors, and Steps/day ($n=1055$ unweighted; 1546 weighted).

	Separate Bivariate Age- Adjusted Model β^a (SE)	Multivariable Main Effects Model β (SE)
Employment Status	p: <.001 ***	p: <.001 ***
Disabled/Not working	-2388.3 (252.8)	-2484.4 (241.5)
Working FT/PT	ref	ref
Gender	p: <.001 ***	p: <.001 ***
Female	-1860.4 (287.6)	-1679.9 (276.3)
Male	ref	ref
BMI (continuous)	p: <.001 *** -92.8 (13.6)	p: <.001 *** -80.4 (13.4)
Age (continuous)		p: <.001 *** -46.8 (6.6)
Education	p: <.001 ***	
<High School	-1097.9 (277.4)	
Completed HS/Voc	-425.9 (300.8)	
Some College +	ref	
Race/Ethnicity ^b	p: .02 *	P=.02 *
Hispanic	403.7 (233.3)	502.2 (222.9)
Black	ref	ref
White	1632.7 (495.9)	1336.9 (467.6)
Racial Discrimination	p-value: .63	p-value: .58
Ever	-115.2 (233.8)	-127.6 (223.5)
Never	ref	ref

* Note: $p \leq .05$.

** $p \leq .01$.

*** $p \leq .001$.

^a Beta represents differences in steps per day.