



Racial Discrimination and Stigma Consciousness are Associated with Higher Blood Pressure and Hypertension in Minority Men

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Abstract

Objective—We examined whether lifetime racial discrimination and stigma consciousness (expecting to be stigmatized) are associated with blood pressure in minority and white middle aged and older adult men.

Design—Participants were 1533 men (mean age=63.2 [SD=7.9, range = 37.4–89.2]; 12.4% black, 7.8% Hispanic, 2.0% other) diagnosed with clinically localized prostate cancer. We separately modeled associations between discrimination/stigma consciousness and blood pressure outcomes for minorities and whites controlling for education, income, employment status, age, marital status, BMI, and recruitment site.

Results—Minorities reported more racial discrimination and stigma consciousness than Whites ($p < .001$). For minorities, having experienced more racial discrimination was associated with having higher diastolic blood pressure ($B = 0.15$, $p = .016$) and having greater stigma consciousness was associated with greater odds of having hypertension ($OR = 1.04$, $p = .047$). Greater stigma consciousness was associated with lower systolic blood pressure in Whites ($B = -0.24$, $p = .012$).

Conclusion—Discrimination and stigma consciousness are associated with common risk factors for chronic disease and premature death that disproportionately affect minorities. Findings for stigma consciousness suggest that anticipatory vigilance may be impacting minority health.

Keywords

discrimination; racism; race/ethnicity; hypertension; blood pressure; stigma consciousness

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Compliance with Ethical Standards

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: informed consent was obtained from all individual participants included in the study.

Introduction

Blacks have a higher incidence of hypertension and pre-hypertension than non-Hispanic Whites [1, 2]. Recent data comparing rates of hypertension and uncontrolled hypertension suggest that Mexican Americans also have higher rates than non-Hispanic Whites [3]. Unless managed, hypertension can lead to life-threatening conditions, including cardiovascular disease, kidney disease, and other morbidities [4–8]. Racial/ethnic discrimination has been identified as a potential source of chronic stress that could increase blood pressure over time and put minorities at risk for hypertension. Racial/ethnic discrimination includes unjust, unfair and prejudicial treatment of individuals grounded in their categorization into socially constructed racial/ethnic categories. Although stemming from cultural beliefs about essential biological differences between these groups, a theory of racial/ethnic discrimination does not itself purport that these biological differences are real.

There is some, although not universal support for the hypothesis that racial/ethnic discrimination is a risk factor for hypertension. In experimental studies, exposure to racism-related stimuli results in elevated cardiac responses, including temporary increases in blood pressure in Blacks [9]. In addition, a number of studies have demonstrated a relationship between everyday experiences of discrimination and higher ambulatory blood pressure in Blacks and Hispanics [10–13]. Cardiac reactivity to discrimination stressors is a plausible mechanism underlying hypertension, given evidence from prospective longitudinal studies that cardiac reactivity predicts risk for developing hypertension years, if not decades later [14, 15]. A number of studies have examined whether there is a correlation between frequency of, or lifetime discrimination and blood pressure or diagnosis of hypertension. Results have been mixed, with some studies having demonstrated positive relations for Blacks and Hispanics [16–18]. Also, in some studies, minorities reporting the lowest and highest discrimination have the highest blood pressure (u-shaped relationship) [19, 20]. The latter has typically been explained as capturing defensive processing or internalized racism. It is hypothesized that those who report the lowest discrimination are coping using denial or internalization which may be more physically harmful than acknowledging and actively coping with discrimination [21]. Finally, a number of studies have failed to find any relationship between discrimination and blood pressure, although in many instances study samples have been small (<200) [22, 23] or relatively young [20, 22, 23]. It is possible that the accumulative impact of racism may take decades to result in hypertension. In individuals aged 18 to 39, prevalence of hypertension range from 3–11% based on sex and race/ethnicity, increases to 22–49% in those aged 40–59 and jumps to 62–83% in individuals 60 years and older [24]. Samples that include primarily younger and middle-aged adults might not be well suited for detecting effects. Consistent with this notion, in a study of older adults, frequency of everyday discrimination was associated with diastolic BP in Blacks (and not Whites) [18]. The Jackson Heart Study (N = 4939) also detected an association between discrimination and hypertension. The mean ages of women and men in the study were 55 and 54 [16].

In the present study, we tested associations between lifetime discrimination and blood pressure and hypertension in a sample of middle aged and older adult men. We did so in men who had been diagnosed with clinically localized prostate cancer, and were recruited to take

part in a study of prostate cancer treatment decision making. One in seven men will be diagnosed with prostate cancer and the risk for Blacks is greater, nearly one in five [25]. It is a common, non-emergent diagnosis that is unlikely to impact relationships between accumulated lifetime experiences of discrimination and blood pressure. This study overcomes the shortcomings of younger samples for which rates of hypertension are low.

We also expand on recent work that is beginning to explore multiple facets of racism. The psychophysiological impact of racism may not be restricted to the discriminatory events themselves, but may also include anticipatory vigilance for discrimination as well as subsequent appraisals or rumination about experienced discrimination [26]. Anticipating discriminatory interpersonal situations has been associated with higher risk for hypertension among Blacks [27] and Latinas [28]. Chronic, even preconscious [29] vigilance for unjust or otherwise discriminatory behavior has been associated with negative health outcomes, including cardiac reactivity [28] and depression [30]. In the present study, in addition to examining the role of experienced discrimination in hypertension, we examine the potential that anticipatory discrimination, assessed via expectations of being stereotyped in interactions with others based on a salient group identity, is associated with higher blood pressure.

Finally, the relationship between discrimination and blood pressure has been studied almost exclusively in Blacks and Whites and rarely in Hispanics. We included Hispanics and other minorities in our study. In sum, the present study helps clarify whether there is a relationship between racial/ethnic discrimination and elevated systolic and diastolic blood pressure and the likelihood of having been diagnosed with hypertension in middle-aged and older minority men.

Methods

Procedure

Data were from participants who had been diagnosed with clinically localized prostate cancer and were taking part in a larger study of prostate cancer treatment decision-making and survivorship in which they were assessed prior to, and every six months for two years following treatment. Participants were recruited from 2 academic cancer centers and 3 community practices in four metropolitan regions. Participants were recruited on average, 47.9 (SD= 62.7) days after diagnosis.. They were approached in-person when they came into the clinic for a post-biopsy or second opinion consultation, or less commonly, a follow-up visit. Participants completed a baseline questionnaire during this visit, or if they did not complete the survey in clinic they were permitted to complete it at home and return it by mail. All participants completed the baseline prior to being treated. Participants were included in the present analyses if they had completed the baseline questionnaire that included questions about experiences of racial discrimination and stigma consciousness, a measure of anticipatory discrimination, as well as demographic characteristics, and if clinical data had been abstracted from their medical records (diagnosis of hypertension, systolic blood pressure, diastolic blood pressure, weight and height). Study procedures were institutional review board-approved.

Participants

Between July 2010 and May 2014, we approached 3337 patients, of whom, 2476 were consented to the study (74%) and 2,008 completed the first questionnaire (81% of consented participants). Of these, 456 were excluded because they did not have chart-abstracted clinical data at the time the analyses were conducted. Nineteen participants were excluded because they did not self-report their race/ethnicity, yielding a final sample of 1,533 men. In this sample, the percentage of missing for other variables were 0.7% for education, 0.2% for employment status, 0.2% for marital status, 2.3% for BMI, 2.0% for stigma consciousness, and 2.0% for systolic and diastolic blood pressure. There were no missing values for age or discrimination.

Measures

Predictor variables—*Lifetime Racial/Ethnic Discrimination* was assessed with the Experiences of Discrimination scale (test-retest reliability = 0.70) [31]. It ascertains how often people have experienced discrimination in 9 situations (e.g., workplace, store, school, medical setting; never/once/two or three times/four or more times) and then asks people to attribute the experiences to one main cause (e.g., race/ethnicity, age, disability). For those who reported any discrimination and attributed it to their race/ethnicity, their score was the sum of the frequencies for all the situations in which they experienced discrimination. If a participant did not report discrimination or reported discrimination but attributed it to something other than race/ethnicity, he received a score of 0. Scores could range from 0 to 40. The measure also assesses how people coped with the discrimination; however, this second part of the questionnaire was not used in the present analyses.

Stigma consciousness was assessed with the 10-item Stigma Consciousness Questionnaire ($\alpha = 0.78$) that is intended to assess individual differences in the degree to which people are chronically self-conscious of their stigmatized status [32], and is associated with vigilance for conscious and non-conscious cues that threaten social identity [29]. Example items include, “When interacting with people of races/ethnicities different from my own, I feel like they interpret all my behaviors in terms of my race/ethnicity.” Whereas in the original questionnaire, items are answered using a 7-point scale [32], we used a 5-point response option that was the same as the one used for several other questionnaire items (1 = strongly agree... 5 = strongly disagree). Scores were summed and could range from 0 to 40.

Blood pressure outcomes—*Self-reported diagnosis of hypertension* and clinic-assessed *systolic blood pressure*, and *diastolic blood pressure* were abstracted from participants’ clinic notes for the date on, or closest to the date that they were consented to the study. Blood pressure measures would always have been assessed prior to treatment. The information would typically have been recorded by a nurse in the clinic intake medical history. Participants were classified as hypertensive if they reported a diagnosis of hypertension or had a systolic blood pressure > 140 mm Hg, or a diastolic blood pressure > 90 mm Hg.

Demographic and clinical covariates—*Participants self-reported years of education* completed, *household income* (<\$25,000 / \$25,000–49,999 / \$50,000–74,999 / \$75,000),

marital status (married or cohabitating vs. single, divorced or widowed), *employment status* (employed vs. not employed), and date of birth from which we calculated *age at diagnosis*. Participants also self-reported their *race/ethnicity* (White, Black or African American, American Indian or Alaska Native, Asian, Middle Eastern (recoded as White) or Native Hawaiian or Other Pacific Islander and Hispanic or Latino vs. not). Racial/ethnic categories except White were collapsed into a minority category due to small sample size in each group. All participants regardless of race who identified as Hispanic or Latino were also included in the minority category. For the sake of brevity, non-Hispanic White is hereafter referred to as White; non-Hispanic Black is referred to as Black, and Hispanic of any race is referred to as Hispanic. Height and weight were abstracted from participants' medical records and body mass index (BMI) was calculated from height (in) and weight (lb) ($(\text{weight}/(\text{height}^2) \times 703)$).

Statistical Analyses

The variable income had 16 % missing data. We imputed income using multiple imputation (30 imputations). Multiple imputation is considered one of the best procedures for addressing data that are missing at random [33].

We tested for differences in racial discrimination, stigma consciousness, and covariates between Whites and minorities as well as between Whites and each racial/ethnic group with t-tests and chi-square tests. For describing the sample (Table 1), years of education was recoded into four categories (<high school / high school / college />college); however, years of education, a continuous variable ranging from 4 to 20, was entered into multivariable analyses as a single continuous variable. We explored which covariates were associated with discrimination or stigma consciousness with multivariable linear regression models containing all covariates (Table 2). Multivariable analyses were conducted separately for minorities and Whites as we expected discrimination and stigma consciousness to only be associated with health outcomes in minorities. We examined linear relationships between lifetime frequency of racial discrimination and stigma consciousness with diagnosis of hypertension, systolic blood pressure and diastolic blood pressure. Given that a u-shaped relationship between discrimination and blood pressure has been reported in some previous studies, we also tested whether there were quadratic effects of discrimination and stigma consciousness on blood pressure outcomes. All analyses were conducted using logistic regression for hypertension (binary outcome) and multiple linear regression for continuous outcomes (blood pressure), and with robust standard errors. We also explored whether any associations varied across the minority groups (Black vs. Hispanic vs. other) by adding interaction terms for race/ethnicity \times discrimination or stigma consciousness as well as testing the models in the Black and Hispanic subsamples. All models included years of education, income, employment status, age, marital status, BMI, and recruitment site as control variables. We used Stata (Version 13, StataCorp) to complete all analyses.

Results

Sample Characteristics and Demographic Factors Associated with Discrimination and Stigma Consciousness

Sample characteristics for Whites, minorities, and the sample as a whole are found in Table 1. Minorities experienced more discrimination and stigma consciousness than Whites. Whites and minorities also varied on several covariates; on average, minorities were less educated, had lower incomes, were less likely to be married, were younger and had slightly higher BMIs. They also were more likely to have been diagnosed with hypertension; however, mean systolic and diastolic blood pressure did not differ across groups. Discrimination and stigma consciousness were correlated, albeit more strongly for minorities ($r = 0.45$, $p < .001$) than Whites ($r = 0.16$, $p < .001$).

Among minorities, higher income and education were associated with experiencing relatively more lifetime discrimination and greater stigma consciousness and being Hispanic or other compared to Black and being married were associated with experiencing less discrimination and having lower stigma consciousness (Table 2).

Multivariable Associations between Lifetime Racial Discrimination / Stigma Consciousness and Health Outcomes

Lifetime racial discrimination—For minorities, lifetime racial discrimination was positively associated with diastolic blood pressure ($B = 0.15$, 95% CI = 0.03, 0.27, $p = .02$) but not hypertension or systolic blood pressure. Racial discrimination was not associated with any outcomes in Whites (Table 3). There was a marginally significant quadratic association between discrimination and diastolic blood pressure in minorities ($B = -0.01$ (95% CI = -0.02 , 0.00), $p = .05$). All other quadratic effects were non-significant, $ps > .12$).

Stigma consciousness—In minorities, stigma consciousness was associated with greater likelihood of having been diagnosed with hypertension (OR = 1.04, 95% CI = 1.00, 1.09, $p = .05$), but not associated with higher diastolic or systolic blood pressure. Greater stigma consciousness was associated with lower systolic blood pressure ($B = -0.24$, 95% CI = -0.4 , -0.05 , $p = .01$) in Whites, but was not related to other health outcomes in Whites (Table 3). There were no quadratic effects for stigma consciousness (results not shown; $ps > .38$).

Did effects vary by race/ethnicity?—Neither discrimination nor stigma consciousness interacted with minority race/ethnicity to predict blood pressure outcomes ($ps > .11$). When we analyzed Blacks and Hispanics separately, we found that associations between discrimination /stigma consciousness and hypertension and blood pressure were positive but did not reach statistical significance ($ps = .08-.97$).

Discussion

Experiencing more racial discrimination during one's lifetime was associated with having higher diastolic blood pressure for minorities but not Whites. Minorities who reported more than 3.5 incidences of discrimination during their lifetimes, the median number for

minorities, had, on average, a diastolic blood pressure 3 mm Hg above those who reported fewer incidences of discrimination. Discrimination was not associated with systolic blood pressure in minorities; Lewis and colleagues also found that in a sample of older Blacks, discrimination was associated with diastolic but not systolic blood pressure [18]. We know less about why a social stressor might have an effect on diastolic blood pressure but not systolic blood pressure [18] than its consequences. Elevated diastolic blood pressure is associated with excess morbidity and death due to a host of cardiovascular outcomes, including coronary and cerebrovascular events, angina, and aortic aneurysm [34].

We detected a relationship between racial discrimination and blood pressure, whereas some other studies have not. One reason for this may be how we measured discrimination. Lifetime discrimination, rather than current experiences of everyday discrimination, may be more strongly associated with blood pressure outcomes given the hypothesis that it is, in part, repeated exaggerated cardiac responses to stress over time that ultimately results in hypertension. Studies in which associations between recent and lifetime discrimination and health outcomes have been compared provide some support. Lifetime, but not everyday discrimination was associated with hypertension in the Jackson Heart Study [16]. Similarly, chronic, but not recent exposure to discrimination was associated with coronary artery calcification in Black women [35]. It bears mentioning that this pattern may not hold for outcomes more likely to be affected by recent exposures to racism such as health behavior, and exceptions have been noted [36].

An important novel finding is that stigma consciousness was associated with hypertension in the minority men in our study. This suggests that the chronic stress associated with discrimination might involve not only reactivity to unfair events, but also anticipating unfair treatment. Stigma consciousness may result in individuals detecting threats more frequently [37], and therefore creating more opportunities to elicit stress responses [38]. It may also be associated with the chronic stress of constant vigilance for social identity and exclusion threats. For example, it has been proposed that hypervigilance results in chronic activation of the hypothalamic-pituitary-adrenal and ultimately, excess release of system-damaging stress hormones [39].

Why Whites with higher stigma consciousness might have lower systolic blood pressure is also an interesting question. The Stigma Consciousness Questionnaire is designed to assess chronically activated expectations of being stigmatized in those who belong to stigmatized groups. In the race version of the questionnaire, several of the items may assess race-consciousness when used in White samples (e.g., “Most people do not judge others on the basis of their race or ethnic group”; “My being a certain race/ethnicity does not influence how people act with me”). It is possible that Whites higher in race consciousness reap psychological benefits of privilege. There are examples of individuals experiencing a stereotype lift in situations where they can make downward comparisons with a derogated outgroup [40]. People with privileged identities who are especially conscious of race/ethnicity may chronically experience stereotype lift from downward social comparisons which dampen reactivity in stressful social or performance situations, ultimately protecting against chronic elevations in blood pressure. The present study is not the only one to demonstrate potential health advantages of privilege. A recent study examining rates of

myocardial infarction in Blacks and Whites as a function of exposure to state levels of structural racism demonstrated that Whites can experience an advantage from structural racism against minorities [41].

Limitations and Strengths

Our study had a number of limitations, including that blood pressure was abstracted from medical records rather than assessed multiple times under controlled conditions. Also, we did not know whether participants were taking medication for hypertension. Medication status might be a useful stratification variable for future studies as it should be easier to detect relations between discrimination and blood pressure in an uncontrolled sample. All minorities were grouped together for the purpose of analysis and we were underpowered to detect interactions between minority groups and the predictors of interest. Even with 340 minorities in our sample we may have been underpowered to detect what are typically small effects of discrimination on blood pressure.

Our participants had been recently diagnosed with prostate cancer or would subsequently be diagnosed with prostate cancer. This is a non-emergent diagnosis that is unlikely to have affected lifetime discrimination, stigma consciousness, and hypertension status. Some men may have had elevated blood pressure due to anxiety or distress from the diagnosis; however, transient reactivity to the context is unlikely to have varied systematically as a function of lifetime discrimination and stigma consciousness. Elevated blood pressure at the time of assessment may have introduced noise into the data, but should not have affected the hypothesized relationships. One exception is that cardiac reactivity may have been higher in patients if they anticipated unfair treatment (or lower among Whites expecting respectful treatment) in the medical setting where their blood pressure was measured. It is always possible that part of the association between discrimination and diastolic blood pressure was due to this reactivity, however, this would not contradict the more general hypothesis that experiencing racial discrimination is associated with elevated blood pressure.

Strengths of the study include assessment of more than one dimension of racial discrimination. Also, our study included groups in whom the association between discrimination and blood pressure have been less studied: older adults, Hispanics, and men. Findings suggest that richer assessment of racism will help us better understand how racism impacts health over the lifecourse.

Conclusion

Findings support an association between racial discrimination and increases in blood pressure and likelihood of developing hypertension over one's lifetime. As with previous studies that have shown similar effects, they were small in magnitude. This may be, in part, due to the difficulty of assessing the multifaceted experience of racism. Discrimination is complex [26]; whether one is targeted may be ambiguous, or may be processed defensively to protect self-esteem. Discrimination experiences can include anticipating unfair treatment, being targeted, and ruminating about past unfair treatment. Stigma may be internalized into one's self-concept or experienced vicariously. New attention is being paid to the effects of microaggressions that are not necessarily captured by traditional measures of discrimination

[42]. Most of these dimensions of discrimination have received little attention in the literature on discrimination and hypertension (for an exception see Hicken 2015). The present study, which demonstrates a relationship between stigma consciousness, or tendencies among members of denigrated groups to anticipate racial discrimination, and hypertension contributes to a more nuanced exploration of racial discrimination and health.

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Table 1

Demographic and Clinical Characteristics of the Sample

Characteristic	Whites (n = 1193) [N, % or Mean (SD)]		Minorities (n = 340) [N, % or Mean (SD)]		p-value	Total sample (n = 1533) [N, % or Mean (SD)]	
Race/Ethnicity							
White	NA	NA	NA	NA	NA	1193	77.82 %
Black	NA	NA	NA	NA		190	12.39 %
Hispanic	NA	NA	NA	NA		120	7.83 %
Other	NA	NA	NA	NA		30	1.96 %
Mean Age	1190	63.58 (7.77)	340	61.85 (8.32)	<.001	1533	63.19 (7.92)
Education ^a							
<High school	27	2.28 %	32	9.50 %	<.001	59	3.87 %
High school	212	17.88 %	72	21.36 %		284	18.65 %
College	537	45.28 %	152	45.10 %		689	45.24 %
>College	410	34.57 %	81	24.04 %		491	32.24 %
Income							
<\$25,000	51	5.06 %	45	15.57 %	<.001	96	7.41 %
\$25,000–49,999	116	11.52 %	64	22.15 %		180	13.89 %
\$50,000–74,999	149	14.80 %	40	13.84 %		189	14.58 %
\$75,000	691	68.62 %	140	48.44 %		831	64.12 %
Employed	714	59.95 %	190	56.05 %	.20	904	59.08 %
Married	1013	84.98 %	260	76.92 %	<.001	1530	83.20 %
Hypertension	747	62.77 %	241	70.88 %	.01	1530	64.58 %
Mean Systolic BP ^b	1170	134.36 (15.84)	333	134.12 (15.28)	.80	1503	134.31 (15.71)
Mean Diastolic BP ^b	1170	79.23 (9.83)	333	80.41 (10.03)	.06	1503	79.49 (9.89)
Mean BMI ^c	1165	28.89 (4.67)	333	29.64 (5.41)	.01	1498	29.06 (4.85)
Racial/ethnic discrimination	1193	0.60 (2.57)	340	7.75	<.001	1533	2.19 (5.83)
Stigma consciousness	1169	14.87 (5.03)	334	18.18 (6.27)	<.001	1503	15.60 (5.50)

Note. Cells may not sum to the total N for each column due to missing data; percentages are for available data.

^aFor the purpose of describing the sample, we subdivided years of education into corresponding degree categories illustrated in this table; however, years of education was entered as a continuous variable in all multivariable linear regression analyses;

^bblood pressure;

^cbody mass index

Table 2

Results of multivariable linear regression models of associations between demographic factors and discrimination / stigma consciousness for minorities and whites

Demographic factor	Discrimination B (95% CI)		Stigma Consciousness B (95% CI)	
	Minority	White	Minority	White
Race/Ethnicity				
Hispanic	-6.38 (-8.40, -4.36) ***	NA	-3.09 (-4.50, -1.69) ***	NA
Other	-7.45 (-10.92, -3.98) ***		-3.40 (-5.82, -0.99) **	
Age	-0.00 (-0.12, 0.12)	-0.01 (-0.04, 0.01)	-0.08 (-0.16, 0.01)	-0.02 (-0.06, 0.03)
Education	0.43 (0.09, 0.77) *	0.04 (-0.01, 0.10)	0.10 (-0.13, 0.34)	-0.09 (-0.20, 0.03)
Income	0.58 (0.03, 1.13) *	0.01 (-0.11, 0.13)	-0.01 (-0.38, 0.36)	-0.07 (-0.30, 0.16)
Employed	-1.71 (-3.84, 0.43)	-0.26 (-0.62, 0.11)	-0.13 (-1.60, 1.34)	-0.13 (-0.86, 0.60)
Married	-4.16 (-6.57, -1.75) **	0.17 (-0.27, 0.61)	-2.42 (-4.10, -0.74) *	-0.77, (-1.64, 0.11)

* p<.05,

** p<.01,

*** p<.001;

Reference group for Race/Ethnicity was African American

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Table 3

Adjusted relationships between discrimination, stigma, racial identity and blood pressure outcomes

	Hypertension ^a OR (95% CI)	Systolic blood pressure ^b B (95% CI)	Diastolic blood pressure ^b B (95% CI)
Minorities			
Discrimination	1.01 (0.98, 1.04)	0.02 (-0.15, 0.19)	0.15* (0.03, 0.27)
Stigma consciousness	1.04* (1.00, 1.09)	-0.11 (-0.37, 0.15)	0.14 (-0.03, 0.32)
Whites			
Discrimination	0.99 (0.94, 1.04)	-0.20 (-0.51, 0.11)	0.09 (-0.10, 0.28)
Stigma consciousness	0.98 (0.95, 1.00)	-0.24* (-0.42, -0.05)	-0.07 (-0.18, 0.04)

Note.

^aModels tested with multivariable logistic regression;^bModels tested with multivariable linear regression;

*p < .05;

Models controlled for education, income, employment status, age, marital status, and recruitment site