

# Association of Race Consciousness With the Patient–Physician Relationship, Medication Adherence, and Blood Pressure in Urban Primary Care Patients

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## BACKGROUND

Race consciousness (the frequency with which one thinks about his or her own race) is a measure that may be useful in assessing whether racial discrimination negatively impacts blood pressure (BP). However, the relation between race consciousness and BP has yet to be empirically tested, especially within the context of the patient–physician relationship and medication adherence.

## METHODS

Race-stratified generalized estimating equations were used to assess the relationship of race consciousness on BP, measures of the patient–physician relationship, and self-reported medication adherence, controlling for patients being nested within physicians and for patient age and sex.

## RESULTS

The mean age of the patients was 61.3 years, 62% were black, and 65% were women. Black patients were more likely to ever think about race than were white patients (49% vs. 21%;  $P < 0.001$ ). Race-conscious

blacks had significantly higher diastolic BP (79.4 vs. 74.5 mm Hg;  $P = 0.004$ ) and somewhat higher systolic BP (138.8 vs. 134.7 mm Hg;  $P = 0.13$ ) than blacks who were not race-conscious. Race-conscious whites were more likely to perceive respect from their physician (57.1% vs. 25.8%;  $P = 0.01$ ) but had lower medication adherence (62.4% vs. 82.9%;  $P = 0.05$ ) than whites who were not race-conscious.

## CONCLUSIONS

Among blacks, race consciousness was associated with higher diastolic BP. In contrast, among whites, there was no association between race consciousness and BP, but race consciousness was associated with poor ratings of adherence, despite more favorable ratings of the patient–physician relationship. Future work should explore disparities in race consciousness and its impact on health and health-care disparities.

**Keywords:** adherence; blood pressure; blood pressure discrimination; disparities; hypertension; perceived quality of care; race; racism.

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Blacks are disproportionately affected by hypertension, having the highest prevalence in the United States and one of the highest rates worldwide.<sup>1,2</sup> Compared with whites, blacks are more likely to have hypertension and be treated with antihypertensive medications but are less likely to have controlled blood pressure (BP).<sup>3,4</sup> Furthermore, blacks report lower rates of antihypertensive medication adherence.<sup>5,6</sup>

Perceived discrimination<sup>4,7–9</sup> and impaired patient–physician relationships<sup>10,11</sup> are 2 potential mechanisms for racial disparities in adherence and hypertension control. It has been suggested that blacks who face discrimination on a

day-to-day basis may “ready themselves” to cope with overt and covert forms of racism through adoption of survival strategies.<sup>7,12,13</sup> Clark and colleagues<sup>14</sup> conceptualize racism as an environmental stressor that, depending on how it is perceived, activates an individual’s coping responses, resulting in a cascade of psychological and physiological responses (allostatic load) that then contribute to health outcomes. The resultant elevation of environmental vigilance and anticipatory threat may contribute to racial disparities in health generally<sup>7,8,15</sup> and specifically to risk of hypertension among blacks.<sup>7</sup> Furthermore, psychological distress among blacks

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has been independently predictive of the development of hypertension;<sup>16</sup> thus the constant psychological vigil and heightened physiological response associated with racial discrimination among blacks may increase their risk of hypertension.<sup>7</sup>

Although perceived discrimination and individual reactions to it may have a direct impact on BP, there is also ample support for an indirect influence on BP through effects of perceived discrimination on patient adherence<sup>8</sup> and the patient–physician relationship.<sup>10,17,18</sup> The existing body of literature does not comprehensively examine the associations between reactions to discrimination and adherence to antihypertensive regimens, patient–provider relationships, and BP among persons with hypertension. Therefore, further investigation is necessary to elucidate these potential mechanisms for racial disparities.

Race consciousness is a novel measure of racial climate at the individual level, originally described by Jones as one potential mechanism to characterize and assess the impact of multiple dimensions of racial discrimination on health disparities.<sup>19</sup> Among blacks, race consciousness is postulated as a heightened awareness of one’s stigmatized status, resulting in heightened vigilance and anticipatory stress toward the threat of discrimination, which could contribute to elevated rates of hypertension and other cardiovascular health issues.<sup>7,8</sup> Indeed, recent work links anticipation of or perseverance on possible discrimination (termed “racism-related vigilance”) to disparities in sleep difficulty between blacks and whites<sup>20</sup> and hypertension prevalence and large arterial elasticity among blacks.<sup>21,22</sup>

There is less knowledge about the meaning of race consciousness and its potential effects among whites. The experience may differ from that for blacks; however, both racial groups may experience psychological stress as a result, leading to poor health. One theory suggests that a strong white racial identity has both progressive and defensive components; thus, race consciousness could have varied meaning and reflect polarized reactions to the social environment among whites of different backgrounds.<sup>23</sup> Given the socially dominant status of whites in the United States, higher levels of race consciousness could reflect greater awareness of white privilege.<sup>24</sup> Another explanation, particularly among whites who reside in areas with a high black population, is that race consciousness represents heightened fear of victimization, an anxiety-provoking stressor.<sup>25</sup> Scholars of critical race theory are still debating whether race consciousness enhances or adversely affects the health of whites.<sup>26</sup>

The clinical relevance of race consciousness and its contribution to racial disparities in hypertension is relatively unexplored. Most studies use indirect measures such as perceived racial discrimination or racial identity.<sup>27</sup> We sought to explore race consciousness and its effect on the patient–physician relationship, medication adherence, and BP control among urban primary care patients. We hypothesized that race consciousness is a measure of vigilance and anticipatory stress among blacks and anxiety-provoked stress among whites, both of which are associated with poorer ratings of the patient–physician relationship, lower medication adherence, and higher BP.

## METHODS

### Study design and population

We analyzed enrollment data from the Patient–Physician Partnership (Triple P) Study, a randomized controlled trial of patient and physician interventions to improve patient–physician communication and adherence to therapy among hypertensive patients in 14 urban community-based primary care clinics in Baltimore, Maryland, serving primarily low-income and/or ethnic minority patients.<sup>28</sup> Approximately 60%–100% of the patients in participating sites were black, and 35%–55% earned <200% of the federally defined poverty guidelines. Patients were enrolled from September 2003 to August 2005. The trial received approval from the Johns Hopkins Institutional Review Board. Informed written consent was obtained from all participating physicians and patients. The Triple P Study enrolled 279 patients with hypertension (36% white, 62% black) and 41 primary care physicians (44% white, 29% black, 24% Asian, 2% Hispanic). For this analysis, we excluded 3 Asian and 2 Native American patients and limited our analysis to black and white patients. Eight patients did not respond to the race-consciousness question, resulting in a sample size of 266 patients.

### Study measures

**Patient characteristics.** At enrollment, patients completed surveys on health status, sociodemographics (age, race/ethnicity, sex, educational level, income and employment status, insurance status), health literacy, experiences of stress (felt stressed sometimes, fairly often, or very often in the last month because of daily hassles or personal problems in one’s life), adherence to recommended therapies for hypertension, and trust in and perceived respect from their clinician. Patients also had a physical exam, which included height, weight, and BP measurements. Patients self-identified as belonging to 1 of 6 racial/ethnic groups: Asian, black/African American, Latino/Latin American or Hispanic, Native American/American Indian, Pacific Islander, or white). Literacy was assessed by the rapid estimate of adult literacy in medicine and was analyzed as a dichotomous variable defined *a priori* as  $\geq 9$ th grade or <9th grade.<sup>29</sup>

**Race consciousness.** The primary exposure variable was race consciousness of patients, assessed using an item from the 2002 Behavioral Risk Factor Surveillance System “Reactions to Race” module developed by the Centers for Disease Control and Prevention.<sup>19</sup> Patients were asked how often they think about their race. Two categories of race consciousness were created: ever think about one’s race (at least once per year, at least once per month, at least once per week, at least once per day, and constantly) and never think about one’s race (never category). Patients who responded “not sure” were categorized as ever think about race; we reasoned that if respondents were unsure how often, they must think about race at least sometimes.

**Patient adherence.** Patient adherence was measured by self-report using a modified version of the 4-item Morisky medication adherence scale examined as a dichotomous

variable of adherent (answered “no” to each of the items) or nonadherent (answered “yes” to at least 1 of the items). The Morisky scale has a sensitivity of 72% and specificity of 74% for  $\geq 80\%$  medication compliance.<sup>30</sup>

**Patient–physician relationship.** Patient perceptions of clinicians were measured by postvisit surveys. Patients rated their attitude toward their primary care physician as “I trust this doctor to look out for my best interests” and their primary care physician’s attitude toward them as “My doctor has a great deal of respect for me” on a 5-point Likert scale. Because the responses were positively skewed, we dichotomized responses as the highest category (i.e., strongly agree) vs. all others, as has been done in previous research using these items.<sup>31</sup>

**Outcome assessment: BP.** The primary outcome, BP, was measured before the baseline visit by trained and certified observers using an automatic oscillometric monitor (Omron HEM 907, Bannockburn, IL). This device programs a 5-minute delay before activation and has a 30-second delay between the triplicate measurements. The average of the 3 measurements was used. BP control was dichotomized as uncontrolled (systolic BP (SBP)  $\geq 140$  mm Hg or diastolic BP (DBP)  $\geq 90$  mm Hg, or SBP  $\geq 130$  mm Hg or DBP  $\geq 80$  mm Hg if history of diabetes or chronic kidney disease) or controlled.

### Statistical analyses

Analyses were conducted on black and white patients separately. Demographic and clinical characteristics of the patients were summarized and compared across race-consciousness groups using  $\chi^2$ , Fisher exact, or 2-sample *t* tests as appropriate. Generalized estimating equations were used to control for patients being nested within physicians. We examined variables associated with BP (i.e., age, income) and the patient–physician relationship (i.e., race concordance) in previous work and included them as covariables only if they were statistically significantly associated with at least 1 outcome for the overall sample. We also conducted analyses to test for potential interactions between race consciousness and feeling stressed on the associations between race consciousness and BP. Finally, we tested whether medication adherence and perceived respect from physicians mediated the association between race consciousness and BP.

Models were initially adjusted for patient’s age and race concordance with the physician, then for age and income. Neither race concordance nor income significantly changed the estimates for race consciousness; therefore they were excluded from the final models. Race consciousness was significantly associated with sex among blacks and with stress within the last month among whites. We chose not to include stress in the final models given its potential role in the causal pathway of race consciousness and BP. The final models are adjusted for patient age and sex. Mean estimates for the continuous outcomes of BP and predicted probabilities from the logit models for dichotomous outcomes are reported. Confidence intervals (CIs) were calculated using robust estimates of the standard error. Analyses were performed

using SAS versions 9.2 and 9.3 (SAS Institute, Cary, NC). All reported *P* values are 2-sided, and significance was set at *P* < 0.05.

## RESULTS

### Characteristics of study sample

Among the 266 participants, 62% were black, and 65% were women. The majority of patients had an income <\$35,000 per year (71.4%) and had a form of health insurance (90.6%) or prescription plan (93.6%). The overall mean age was 61.3 years.

### Race consciousness

Almost half of black patients were likely to ever think about their race compared with about 1 in 5 white patients (49.4% vs. 21.0%; *P* < 0.001). Sociodemographic characteristics for blacks and whites by race consciousness status are presented in [Table 1](#). As mentioned previously, sex was significantly associated with race consciousness among black patients. For whites, there was a significant association between race consciousness and the report of at least some stress within the last month. No other patient characteristics significantly differed by race-consciousness status.

### Association of race consciousness with BP levels and control

[Table 2](#) shows the association of race consciousness with BP stratified by racial group. Race-conscious black patients had significantly higher DBP and somewhat, though not statistically significant, higher SBP than those who were not race conscious. There were no differences between the 2 groups among whites in SBP or DBP. Furthermore, there was no statistically significant difference in the adjusted predicted probabilities of BP control among blacks or whites who ever think about their race and those who do not ([Table 3](#)).

### Association of race consciousness with self-reported medication adherence

Race-conscious black patients had somewhat lower medication adherence than black patients who were not race conscious, but this difference was not statistically significant ([Table 3](#)). Race-conscious whites had lower medication adherence than those who were not race conscious.

### Association of race consciousness with the patient–physician relationship

Among blacks and whites, there were no statistically significant differences in trust between patients who were and were not race conscious. There were no differences in perceived respect between blacks who were and were not race conscious. A higher percentage of race conscious white patients perceived respect from their clinicians than whites who were not race conscious ([Table 3](#)).

**Table 1.** Baseline demographic and clinical characteristics for black and white patients by race consciousness

Characteristic	Black patients			White patients		
	Ever (n = 82)	Never (n = 84)	P value	Ever (n = 21)	Never (n = 79)	P value
Age, years	59.4 (10.9)	61.0 (12.7)	0.39	60.4 (9.3)	63.9 (12.4)	0.23
Sex, female	49 (60)	63 (75)	0.047	12 (57)	50 (63)	0.62
Marital status, married	26 (32)	17 (20)	0.11	11 (52)	40 (51)	1.0
Education						
<High school graduate	28 (35)	30 (36)	1.0	4 (19)	21 (27)	0.58
Years	11.9 (2.5)	11.6 (2.4)	0.50	12.6 (2.6)	11.9 (2.1)	0.18
REALM, <9th grade	38 (48)	34 (41)	0.53	3 (14)	18 (23)	0.55
Income						
<\$10,000	32 (41)	36 (46)	0.63	2 (10)	22 (30)	0.09
<\$35,000	56 (72)	64 (81)	0.19	11 (52)	49 (66)	0.31
Employed			0.53			0.08
Full time	20 (25)	12 (15)		5 (24)	12 (15)	
Part time	4 (5)	6 (8)		1 (5)	4 (5)	
Retired	23 (28)	30 (38)		3 (14)	36 (46)	
Disabled	19 (23)	21 (26)		6 (29)	10 (13)	
Healthcare insurance	75 (93)	75 (89)	0.59	21 (100)	69 (87)	0.12
Medicaid	25 (31)	36 (43)	0.06	5 (24)	12 (15)	0.48
Medicare	27 (34)	38 (46)	0.17	6 (29)	31 (39)	0.45
Other	40 (49)	36 (44)	0.53	11 (55)	51 (65)	0.45
Prescription plan	77 (96)	78 (93)	0.50	20 (95)	72 (91)	1.00
MOS-SF-12 physical component	41.8 (11.4)	39.3 (13.5)	0.20	36.8 (13.3)	40.2 (11.3)	0.25
MOS-SF-12 mental component	50.9 (10.8)	52.7 (9.7)	0.28	47.1 (12.7)	49.8 (10.6)	0.33
Felt stress in the last month at least sometimes	47 (59)	40 (49)	0.21	17 (85)	44 (56)	0.02
Diabetic	43 (54)	44 (53)	1.0	9 (43)	20 (25)	0.17
Body mass index, kg/m <sup>2</sup>	32.4 (7.1)	33.9 (8.8)	0.25	31.7 (7.4)	32.7 (8.1)	0.61
Race concordant clinician	32 (39)	29 (35)	0.63	15 (71)	45 (57)	0.32

Results are mean (SD) or number (%). P values are from Fisher exact test or two-sample t-test.

Abbreviations: REALM, rapid estimate of adult literacy in medicine; MOS-SF-12, Medical Outcomes Study 12-item short form.

### Additional analyses

There were no statistically significant interactions of stress with race consciousness on the outcomes of SBP or DBP among blacks or whites. Additionally, neither medication adherence nor perceived respect mediated the association between race consciousness and BP among blacks or whites (data not shown).

### DISCUSSION

Race consciousness is associated with higher DBP and may be associated with higher SBP among black but not white patients with hypertension. In contrast, race consciousness is associated with ratings of the patient–physician relationship and adherence among whites but not blacks. Our findings provide novel insights that advance current knowledge

of race consciousness among black and white primary care patients and the potential role it plays in influencing cardiovascular health and the patient–physician relationship.

Similar to previous work, we found that black patients reported a higher level of race consciousness than their white counterparts. According to Jones,<sup>19</sup> this discrepancy in itself captures the discordant nature of the racial climate that the blacks and whites in our society experience, an environment that not only confers racial disadvantage to blacks but may also accord racial advantage to whites. Interestingly, among whites in this study, race consciousness was associated with higher ratings of the patient–physician relationship but lower medication adherence. Taken together, these findings reflect the complexity in understanding race consciousness among blacks and whites. Recent studies have supported the assertion that blacks experience race consciousness as hypervigilance, whereas whites often experience it as an

**Table 2.** Association of racial consciousness with blood pressure stratified by race

Outcome	Black patients			White patients		
	Ever (n = 82)	Never (n = 84)	P value	Ever (n = 21)	Never (n = 79)	P value
SBP, mm Hg	138.8 (134.0–143.5)	134.7 (131.4–137.9)	0.13	139.7 (125.1–134.3)	132.7 (127.3–138.1)	0.47
DBP, mm Hg	79.4 (76.9–81.9)	74.5 (72.2–76.9)	0.004	72.3 (68.6–76.1)	73.4 (70.6–76.2)	0.64

Data are mean estimates and 95% confidence intervals from generalized estimating equations analysis adjusting for patient age and sex and controlling for nesting of patients within physician.

Abbreviations: DBP, diastolic blood pressure; SBP, systolic blood pressure.

**Table 3.** Association of racial consciousness with dichotomous outcomes stratified by race

Outcome	Black patients			White patients		
	Ever (n = 82)	Never (n = 84)	P value	Ever (n = 21)	Never (n = 79)	P value
Controlled BP	41.6 (31.6–52.3)	42.8 (33.7–52.4)	0.88	62.3 (39.9–80.5)	60.2 (48.5–70.8)	0.86
Adherent on Morisky	52.8 (42.4–63.1)	61.5 (50.8–71.2)	0.14	62.4 (42.9–78.5)	82.9 (77.6–87.2)	0.05
Trust in clinician	67.4 (56.5–76.7)	59.2 (47.1–70.2)	0.30	84.5 (64.3–94.3)	68.7 (59.8–76.4)	0.15
Perceived respect	34.8 (25.3–45.7)	32.5 (19.9–48.3)	0.75	57.1 (34.0–77.5)	25.8 (17.2–36.8)	0.01

Data are predicted probabilities and 95% confidence intervals from generalized estimating equations regression analysis adjusting for patient age and sex and controlling for nesting of patients within physician.

Abbreviation: BP, blood pressure.

anxiety-provoking stressor.<sup>8,20–22</sup> Although the experience of this measure may be discrepant for the 2 racial groups, both may similarly experience psychological stress as a result, leading to negative health behaviors and outcomes.

Our findings related to race consciousness and BP add support to an emerging body of evidence examining the association between the psychological stress related to racial discrimination and BP. Several studies have suggested biological mechanisms linking chronic social stress and cardiovascular reactivity.<sup>15,22,32,33</sup> In particular, stress may result in sustained BP elevations through increased sympathetic tone resulting in norepinephrine-induced vasoconstriction.<sup>34</sup> Furthermore, different types of chronic stressors, including perceived discrimination, may preferentially affect SBP and DBP.<sup>35</sup> For instance, tasks that require active coping efforts may lead to an increase in heart rate and SBP, whereas tasks that require quiet attentiveness and vigilance may lead to decreased cardiac output as well as increased total peripheral resistance and DBP. These biological mechanisms may explain our findings and lend support to our hypothesis that in persons for whom race consciousness represents increased vigilance to situations, there may be enhanced diastolic responses, whereas in those for whom race consciousness represents efforts to cope with perceived discrimination of their ethnic group, there is greater vascular reactivity.

Black patients in this study had lower rates of antihypertensive medication adherence than their white counterparts. Although race-conscious blacks had the lowest self-reported adherence of all study groups, the association of race-consciousness and adherence was not statistically significant among blacks. Paradoxically, although race-conscious whites reported higher quality ratings of the patient–physician relationship, they also had lower levels of medication

adherence than their counterparts who were not race-conscious. McIntosh describes the theory of racial privilege as an existence in which whites unintentionally benefit and develop a sense of entitlement from biases within contemporary American society stemming from the foundational roots of racism in US history.<sup>24</sup> Racial privilege by whites has been associated with poor physical and mental health.<sup>36</sup> If race consciousness among whites is associated with awareness of their privileged status in society, guilt and moral ambivalence are potential mechanisms for the negative health behaviors reported in our sample. Alternatively, race-conscious whites in our study may have experienced greater physical and social environmental stresses and fears of victimization that have been observed among whites living in areas that are predominantly black.<sup>25</sup> This anxiety and stress may have contributed to poorer medication adherence.

Our findings on the influence of race consciousness on the patient–physician relationship differ from those demonstrated by other studies examining race itself. In these studies, minority patients report lower-quality physician interactions.<sup>10</sup> Contrary to our hypothesis, there was no association between race consciousness and measures of the patient–physician relationship among blacks. Race-conscious blacks may not have reported stronger opinions about their physicians out of concern for the possible negative impact on ongoing health care. It has also been suggested that blacks may have developed a normative perception of racism and discrimination because of their repetitive exposures in their natural environments.<sup>7</sup> White patients who were race-conscious perceived higher levels of respect from their physicians than their counterparts who were not race-conscious. Similar to the explanation we proposed previously, one could infer that some race-conscious white patients have a

greater awareness of their institutional privilege within the health-care system.

Our study findings should be interpreted in the context of the following limitations. This is a cross-sectional analysis where both race consciousness and our outcome variables were measured at 1 clinical encounter. We may not have captured patients' lifetime exposure and reactions to racism or their overall health-care experiences and health status. This limits our ability to draw causal inferences between race consciousness and the patient-physician relationship, medication adherence, or BP control. Because of the relatively small sample size and limited response distributions, the magnitude or dose-response relationship of race consciousness as a construct was not assessed. There may also have been recall bias and social desirability response bias in the self-reported measures. Our results may have limited external validity. The study included an urban population, where many individuals tend to reside in fairly racially homogenous settings with potentially segregated neighborhoods and work environments and where acculturation may influence the likelihood to report perceived racism.<sup>37</sup> Our sample of black patients is older, has higher educational attainment, and has a higher proportion of women and our sample of white patients is older, has lower educational attainment, and has a higher proportion of women than national samples of blacks and whites with hypertension, respectively.<sup>38</sup> Additionally, the study sample included community-based physicians enrolled in a clinical trial who may have been more motivated about communication skills and caring for minority patients than are other physicians. Moreover, patients and physicians were reasonably well known to each other, and reports of the relationship were positively skewed. Finally, our study was not designed to assess the full spectrum of biopsychosocial mechanisms connected to race consciousness that might explain our findings.

Despite these limitations, this is the first study to our knowledge to examine associations between race consciousness and the patient-physician relationship, medication adherence, and BP among patients with hypertension in urban primary care clinics. There remains no consensus on the optimum manner to measure experiences of and reactions to discrimination; prior studies using everyday measures of discriminatory experiences have shown inconsistent results on hypertension outcomes.<sup>13,39,40</sup> However, here we provide support for the use of a measure of race consciousness to assess associations between racial climate, patient experience in actual clinical encounters, adherence to medications, and BP outcomes. Future research should seek to replicate and better understand these findings and to explore these relationships over time. Additionally, research is crucial to identify biological influences of race consciousness, including those related to upregulated sympathetic activity and stress. Identifying the magnitude of effect and mechanisms of influence could inform the development of interventions. Strategies that reduce exposures and responses to psychosocial stress among blacks and whites could be used to mitigate the influence of race consciousness on medication adherence among whites and on BP among blacks with hypertension.

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## DISCLOSURE

The authors reported no conflict of interest.

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