ORIGINAL RESEARCH

An Investigation of Associations Between Clinicians' Ethnic or Racial Bias and Hypertension Treatment, Medication Adherence and Blood Pressure Control

Irene V. Blair, PhD[1], John F. Steiner, MD, MPH[2], Rebecca Hanratty, MD[3], David W. Price, MD[2], Diane L. Fairclough, DrPH[4], Stacie L. Daugherty, MD, MSPH[5], Michael Bronsert, PhD[4], David J. Magid, MD[2], and Edward P. Havranek, MD[6]

[1]Department of Psychology & Neuroscience, University of Colorado, Boulder, CO, USA; [2]Institute for Health Research, Kaiser Permanente Colorado, Denver, CO, USA; [3]Division of General Internal Medicine, Denver Health, Denver, CO, USA; [4]Colorado Health Outcomes Center, University of Colorado, Denver, CO, USA; [5]Division of Cardiology, University of Colorado, Denver, CO, USA; [6]Division of Cardiology, Denver Health, Denver, CO, USA.

BACKGROUND: Few studies have directly investigated the association of clinicians' implicit (unconscious) bias with health care disparities in clinical settings.

OBJECTIVE: To determine if clinicians' implicit ethnic or racial bias is associated with processes and outcomes of treatment for hypertension among black and Latino patients, relative to white patients.

RESEARCH DESIGN AND PARTICIPANTS: Primary care clinicians completed *Implicit Association Tests* of ethnic and racial bias. Electronic medical records were queried for a stratified, random sample of the clinicians' black, Latino and white patients to assess treatment intensification, adherence and control of hypertension. Multilevel random coefficient models assessed the associations between clinicians' implicit biases and ethnic or racial differences in hypertension care and outcomes.

MAIN MEASURES: Standard measures of treatment intensification and medication adherence were calculated from pharmacy refills. Hypertension control was assessed by the percentage of time that patients met blood pressure goals recorded during primary care visits.

KEY RESULTS: One hundred and thirty-eight primary care clinicians and 4,794 patients with hypertension participated. Black patients received equivalent treatment intensification, but had lower medication adherence and worse hypertension control than white patients; Latino patients received equivalent treatment intensification and had similar hypertension control, but lower medication adherence than white patients. Differences in treatment intensification, medication adherence and hypertension control were unrelated to clinician implicit bias for black patients (P=0.85, P=0.06 and P=0.31, respectively) and for Latino patients (P=0.55, P=0.40 and P=0.79, respectively). An increase in clinician bias from average to strong was associated with a relative change of less than 5 % in all outcomes for black and Latino patients.

CONCLUSIONS: Implicit bias did not affect clinicians' provision of care to their minority patients, nor did it affect the patients' outcomes. The identification of health care contexts in which bias does not impact outcomes can assist both patients and clinicians in their efforts to build trust and partnership.

KEY WORDS: hypertension; healthcare disparities; discrimination; implicit bias; race/ethnicity; quality.
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INTRODUCTION

Ethnic and racial health disparities persist in health care, with long-standing concerns that clinician bias contributes to the problem.[1–5] The Institute of Medicine (IOM)[3] has called for research to identify clinical situations in which bias may operate.

Bias against minority groups is a more complex phenomenon than is commonly appreciated. Bias can be overt (explicit bias) or hidden and unconscious (implicit bias).[6–9] Implicit bias is often present even when explicit bias is absent.[10,11] Recent studies[12–14] show that clinicians are no different from the broader population, having substantial implicit bias against minority groups, even as they report little explicit bias. Greater implicit bias among clinicians, in turn, has been linked to less patient-centered interactions with black patients.[15–17] Evidence on the effects of clinician implicit bias on medical decisions in hypothetical scenarios has been mixed.[13,18–20]

The linkage between clinician implicit bias and more technical processes and outcomes of care has not been

directly investigated. This study was conducted to help fill that gap. We focused on primary care because it is the cornerstone of the health care system in the United States. Americans in 2009 made over 1 billion office visits for health care, of which the majority for both whites and blacks were to primary care clinicians.[21] The most common diagnosis in these visits was essential hypertension.[22] Due to the importance of primary care, the prevalence of hypertension, and documented ethnic/racial disparities in hypertension control,[23] we investigated the potential association between clinicians' implicit biases and ethnic/racial differences in their patients' intensification of treatment, medication adherence and hypertension control.

METHODS

Study Participants and Data Collection: Clinicians

Adult primary care clinicians in the Denver metropolitan area were recruited in a prior study on ethnic/racial attitudes.[12] Implicit bias data collected from these clinicians were included in the present study for the two participating organizations that had electronic patient data. Denver Health is an integrated safety-net system that sees more than 100,000 unique patients in its community clinics each year. Kaiser Permanente Colorado is a closed panel, group model, not for-profit health maintenance organization (HMO) with approximately 480,000 members in the Denver metropolitan area. Institutional Review Boards for each institution approved the study protocol.

Implicit Association Test. Implicit ethnic and racial biases were measured with two Implicit Association Tests (IATs).[24–26] The IAT assesses the relative speed with which one can respond to a group and positive vs. negative words. Implicit bias against ethnic minorities compared with whites, for example, is shown if one is significantly faster when minority faces and negative words require the same response while white faces and good words require another response, compared with the reverse pairing. The larger this performance difference, the stronger the implicit bias (see https://implicit.harvard.edu). The IAT has been widely used and its psychometric properties and methodological strengths and limitations have been extensively reviewed.[26–30] Implicit attitudes, as measured by the IAT over multiple points in time, have been shown to have reasonable stability.[26,28] The two IATs completed by the clinicians in this study were validated in previous research to measure implicit bias against blacks compared with whites and against Latinos compared with whites.[12,25] Possible scores ranged from −2 to +2, with negative scores indicating bias against whites, positive scores indicating bias against blacks or Latinos, and 0 indicating no bias.

Study Participants and Data Collection: Patients

Patients were identified through primary care visit patterns. Eligible patients saw a participating clinician for a majority of primary care visits, at least three times during the observation period (June 2006 – May 2009). Patients who saw two clinicians exactly 50:50 (8 % of the sample) were assigned to the most recent clinician. A prior study[15] with this patient population produced 93 % agreement between this algorithm and the patients' own identification of their primary care clinician.

The patients' records were screened to identify those with two or more diagnoses of hypertension (401.xx–404.xx).[31] Patients were then eligible for inclusion if: (a) there was no comorbidity that would significantly alter hypertension treatment (e.g., end-stage renal disease or hospice care); (b) they had at least one blood pressure (BP) recorded in the last 18 months of the observation period; and (c) their recorded ethnicity/race was either black, Latino or white. Patients were excluded if they had opted out of research studies. Additional requirements were set for each outcome. Because participation in the study could alter clinicians' subsequent behavior with patients, treatment intensification and medication adherence were examined during the 3 years (June 2006–May 2009) just prior to the clinicians' participation. BP records were analyzed through November 2009.

Conceptual Model Guiding Patient Measures. Conceptually, clinicians' implicit bias may alter minority patients' treatment and health in two ways, as shown in Fig. 1.[5,32,33] First, implicit bias may have a direct, negative effect on clinicians' decisions about their patients (Path A). Second, it may indirectly affect care processes through reductions in the quality of clinical interactions (Path B). The combination of these two processes would result in reductions in treatment intensification and patients' medication adherence, which in turn would reduce patients' hypertension control.

Treatment Intensification. Established procedures were followed to assess treatment intensification on the basis of pharmacy dispensing records.[34,35] A baseline regimen was defined for each patient by the antihypertensive medication fills in a 90-day period, initiated by the first fill following the patient's first visit with the clinician during the observation period.

Observed treatment intensification was defined as a dose increase of an existing antihypertensive medication or the addition of a new class of antihypertensive medication. An

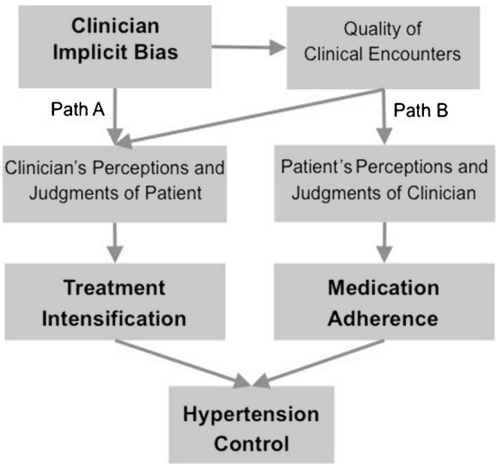

Figure 1. Conceptual model of the influence that clinician implicit bias may have on treatment, adherence and control of hypertension. Variables that are assessed in this study appear in bold print. Path A indicates the potential for clinician bias to affect decisions about treatment intensification. Path B indicates the potential for clinician bias to affect patients' trust and commitment to medication adherence. Many additional factors that affect treatment, adherence and hypertension control, including recursive processes, are not shown in this figure.

expected treatment intensification was defined as a visit in which a recorded BP was elevated above guidelines for hypertension control, contained in the *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluations, and Treatment of High Blood Pressure* (JNC7).[36] Using a standard scoring method,[34,35,37,38] appropriate treatment intensification was calculated after the baseline period, by subtracting the number of expected intensifications from the number of observed intensifications, and then dividing this difference by the number of primary care visits during the observation period. This score had a range of −1 to 1, with −1 indicating no intensification at any visit with an elevated BP, 0 indicating intensification at every visit with an elevated BP, and 1 indicating intensification at every visit regardless of BP. Patients could only be included in this analysis if they had filled antihypertensive prescriptions during the baseline and follow-up periods, and if they had BP measures during the follow-up period.

Medication Adherence. Established procedures were followed to calculate medication adherence on the basis of pharmacy records.[34,35] Medication adherence was calculated for each patient only after the patient's first visit with the clinician during the observation period. At least two antihypertensive medication fills following that first visit were necessary for inclusion in the analysis.

A standard adherence score was calculated as the percent of days covered[34,35,39,40] (0–100 %), based on the number of days of antihypertensive medication obtained divided by the number of days between the first and last refill. For patients receiving multiple antihypertensive medications, an average score was calculated.

Hypertension Control. All electronic BP records were obtained for outpatient primary care visits during the observation period.[41,42] To ensure appropriate connection to the clinician, BP was analyzed only after the patient's first visit with the clinician in that period. If more than one BP was recorded in a single day, the average for that day was used.

The primary measure of hypertension control was the percentage of time (0–100 %) that patients' BP met JNC7 guidelines.[36] Specifically, for each patient, each BP record in the observation period was characterized as meeting or not meeting JNC7 guidelines, and then this designation was given for the number of days until the next BP record. The total number of days designated as meeting guidelines was then divided by the total number of days between the first and last BP records, to control for the amount of time that was considered for that patient. Secondary measures of hypertension control included the percentage of time (0–100 %) the patients were kept out of Stage 2 hypertension[36] and longitudinal analysis of all of the patients' systolic BP (SBP) records across the observation period. We focused on SBP because uncontrolled SBP has a stronger association with important health outcomes than diastolic BP.[43] An analysis with diastolic BP produced the same results (data not shown).

Comorbidities. ICD-9 codes were obtained for the observation period and the year prior. The comorbidity algorithms developed by Quan and colleagues[44] were used to define relevant comorbidities: diabetes, congestive heart failure (CHF), coronary heart or artery disease (CHD), cerebrovascular disease (CVD), and peripheral vascular or arterial disease (PVD). Lab records for serum creatinine were also obtained to calculate eGFR for chronic kidney disease (CKD; eGFR <60 mL/min/1.73 m^2), using the abbreviated *Modification of Diet in Renal Disease* study equation.[45]

Sociodemographics. Patients' age, gender and ethnicity/race were obtained from administrative records. A prior study[15] with these patients showed that the records were 90 % consistent with patients' self-identified ethnicity/race.

Statistical Analysis

The primary effects of interest were ethnic or racial differences in treatment intensification, medication adherence and control of hypertension, and the associations between these differences and levels of clinician implicit bias. The data were analyzed using multilevel random coefficient modeling (mixed effects models), with patients modeled at level 1, clinicians at level 2 and clinics at level 3. This analysis provided estimation of the main effects at each level, as well as testing the effects of the interaction

between patients' ethnicity/race (level 1) and clinician implicit bias (level 2). The clinicians' IAT scores for bias against blacks were used as predictors of outcomes for black patients; IAT scores for bias against Latinos were used as predictors of outcomes for Latino patients. Because the IAT measures relative bias (black vs. white or Latino vs. white), white patients always served as the ethnic/racial reference group.

All outcomes were analyzed as continuous variables. A common set of patient covariates was included in each analysis: age, gender and comorbidities (diabetes, CHF, CHD, CVD, PVD & CKD). Patients' ethnicity/race, gender, age (<60 vs. 60+ yrs) and the presence of each comorbidity were analyzed as dichotomous. The longitudinal analysis of patients' BP also included time (in years) as a parameter.

Sampling and Power Analysis. Based on the ethical principle of accessing only the patient records necessary to achieve our scientific aim, stratified random sampling was used. We randomly selected equal numbers of patients from the three ethnic/racial groups and approximately equal representation from age and gender groups for each primary care clinician, when sufficient patients were available. Initial sample size calculations were based on conservative estimates of the interclass correlations.

With our observed sample sizes and interclass correlations (e.g., 0.6 % unexplained variance among clinicians for percent time at JNC7 guidelines), we had 90 % power (alpha=0.05, two-sided, using hierarchical model analysis) to detect associations between clinician implicit bias and ethnic/racial variation in outcomes that correspond to correlations as low as 0.12 and 0.09 for black and Latino patients, respectively. For example, for percent time at JNC7 guidelines, we had 90 % power to find a statistically significant effect as small as a 3.57 % difference for black patients (2.78 % for Latino patients), associated with a one standard deviation change in clinician implicit bias.

RESULTS

From the original sample of clinicians who completed measures of ethnic/racial bias,[12] 138 were eligible for this study because their organizations maintained electronic health records (66 % of the original sample; 52 % of primary care clinicians in the participating organizations). These clinicians were 54 % female, 83 % white, and 49 % had more than 10 years of clinical experience. Nearly 70 % of the clinicians showed some implicit bias against blacks or Latinos; 42 % of the sample had moderate-to-strong levels of bias against blacks and 51 % of the sample had moderate-to-strong levels of bias against Latinos.

Figure 2 shows the patient selection process for this study. Table 1 shows the characteristics of the final sample of 4,794 patients (982 black; 1,484 Latino; 2,328 white). Compared to the white patients, the minority patients were slightly younger, had more visits with their clinicians and had similar rates of comorbidities, with the exceptions of diabetes (higher among Latinos), and PVD and CKD (higher among Whites).

Treatment Intensification

Average levels of treatment intensification did not differ significantly across groups (P=0.31). As shown in Table 2, averages of −0.37 to −0.40 indicate that intensification occurred 37 %–40 % less frequently than would be expected by the number of elevated BP readings. Variation in treatment intensification was not associated with clinician implicit bias (P=0.85 for black patients and P=0.55 for Latino patients; see Table 3 for full parameter estimates). As shown in Table 4, a 1 SD increase in clinician bias (e.g., from average to strong bias) was associated with no change in treatment intensification for black patients and an increase of 0.01 in intensification for Latino patients.

Medication Adherence

Average levels of medication adherence were lower for black and Latino patients than white patients (P<0.0001; 79.3 % and 81.4 %, versus 86.8 %, respectively). Variation in adherence was not associated with clinician implicit bias (P=0.06 for black patients and P=0.40, for Latino patients; Table 3). A 1 SD increase in clinician bias was associated with 0.4 % increase in adherence for black patients and 0.1 % decrease in adherence for Latino patients.

Hypertension Control

The average percentage of time that patients' BP met guidelines was lower for black patients (43.5 %, P<0.01) than for Latino (47.7 %) or white (47.4 %) patients. Variation in hypertension control was not associated with clinician implicit bias (P=0.31 for black patients and P=0.79 for Latino patients; Table 3). A 1 SD increase in clinician implicit bias was associated with 1.7 % (6 days/year) decrease for black patients and 0.6 % (2 days/year) increase for Latino patients.

Secondary measures of hypertension control produced equivalent results. Black patients spent less time than white patients out of Stage 2 hypertension (87.0 % vs. 91.5 %, P<0.0001), and across the observation period, had overall higher SBP than white patients (SBP=134.8 vs. 132.5 mmHG, P<0.0001). Latino patients did not differ from white patients in time out of Stage 2 Hypertension (P=0.16) or SBP over time (P=0.43; Table 2). Clinician implicit bias was not associated with time out of Stage 2 hypertension (P=0.19 for black patients and P=0.90 for

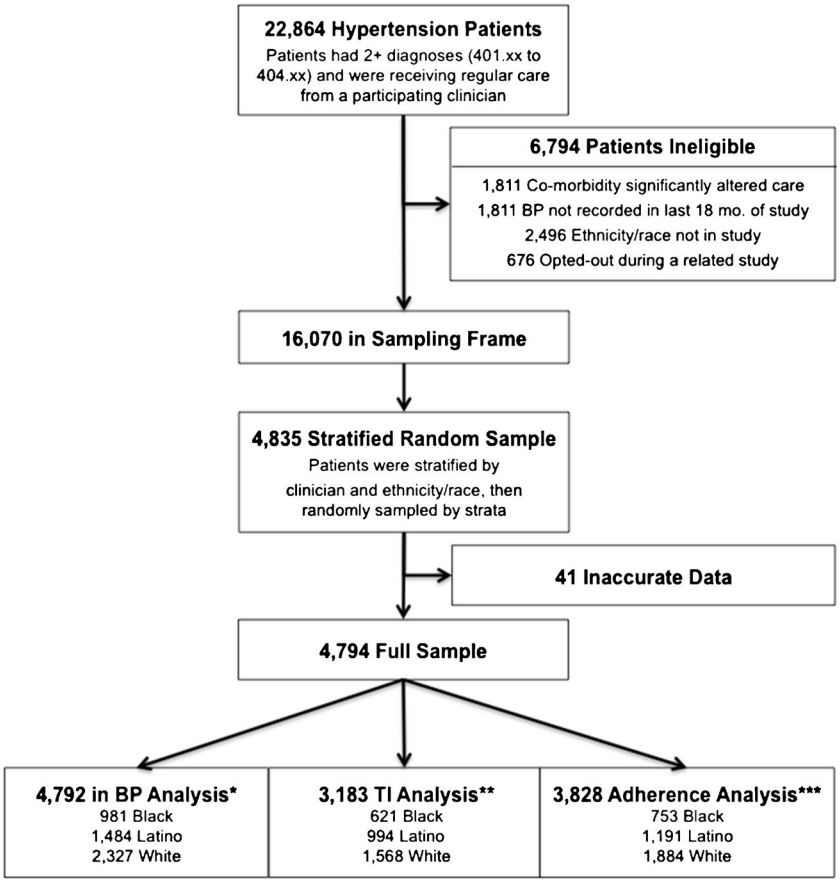

Figure 2. Flow of hypertension patients included in the study. Notes: *2 excluded for no BP recorded after first visit with clinician; **1,611 excluded: 505 had no anti-hypertension prescription fills at all, 228 had no fills following first visit with clinician, 597 had less than two BP, and 281 had no fills during the follow-up period; ***966 excluded: 505 had no anti-hypertension prescription fills at all, 228 had no fills following first visit with clinician, and 233 had only one fill.

Latino patients; Table 3), nor with SBP over time (P=0.89 for black patients and P=0.63 for Latino patients; full parameter estimates are available in online appendix).

DISCUSSION

This study found no evidence that the implicit biases of primary care clinicians were associated with less treatment intensification, worse adherence or worse BP control for black or Latino patients receiving care for hypertension. Our conceptual model suggests two routes through which clinician bias may produce ethnic/racial health disparities: A direct effect on clinical decision-making, and an indirect effect through communication and clinical interaction. A closer look at the evidence suggests that additional factors may need to be considered.

Research on the direct route has produced mixed results, and until now was entirely derived from surveys using

Table 1. Clinical and Demographic Characteristics of Hypertension Patients by Ethnicity/Race

Characteristics	Black n=982	Latino n=1,484	White n=2,328
Age *M* (*SD*)*	57 (12)	60 (13)	63 (13)
Female Gender (%)	574 (59 %)	878 (59 %)	1,330 (57 %)
Proportion of visits with clinician *M* (*SD*)	0.79 (0.17)	0.78 (0.17)	0.78 (0.17)
Number of visits with clinician *M* (*SD*)***	9.9 (6.9)	10.2 (7.1)	9.3 (6.5)
Comorbidities			
Diabetes (%)***	355 (36 %)	745 (50 %)	800 (34 %)
CHF (%)	87 (9 %)	114 (8 %)	163 (7 %)
CHD (%)	136 (14 %)	226 (15 %)	380 (16 %)
CVD (%)	73 (7 %)	131 (9 %)	223 (10 %)
PVD (%)***	45 (5 %)	80 (5 %)	192 (8 %)
CKD (%)***	298 (30 %)	518 (35 %)	1,105 (48 %)

****Racial/ethnic groups differ significantly, p< 0.001*

Table 2. Adjusted Outcome Averages by Patients' Ethnicity/Race

Outcome	Black	Latino	White
Treatment Intensification	−0.40	−0.37	−0.39
Percent Days Covered with Antihypertensive Medication	79.3 %***	81.4 %***	86.8 %
Percent Time at JNC7 Goal	43.5 %*	47.7 %	47.4 %
Percent Time out of Stage 2 Hypertension	87.0 %***	90.7 %	91.5 %
Systolic BP (mm HG)	134.8***	132.8	132.5
Diastolic BP (mm HG)	81.0***	78.5	78.9
Number of Antihypertensive Medications			
Baseline	2.01***	1.78	1.70
Follow-up	2.53***	2.24*	2.13

**p< 0.05, ***p< 0.001 different from white comparison group*
NOTES: Treatment Intensification was the proportion of time that patients' anti-hypertension medications were increased in dosage or class, given an elevated BP; a negative proportion indicates fewer intensifications than elevated BP. All outcomes were adjusted for patients' age, gender and comorbidities (diabetes, CHF, CHD, CVD, PVD and CKD). Systolic and diastolic BP were also adjusted for time. The number of patients in each group differs across outcomes (see Fig. 2)

hypothetical clinical vignettes. A widely cited report by Green and colleagues[13] found that resident clinicians with greater implicit bias were less likely to recommend thrombolytic therapy for a hypothetical black patient with myocardial infarction, but this did not occur when the patient was described as white. On the other hand, a study[18,19] on pediatric decision-making showed that some of the hypothetical decisions were associated with implicit bias, but others were not. Finally, a study[20] with medical students failed to find any relation between hypothetical clinical decisions and the students' implicit bias. The null results obtained in the current study suggest that the medical decisions of these experienced, primary care clinicians were not influenced by implicit bias, at least not to an extent that compromised the care processes and outcomes that were investigated with the patients included in this study.

Evidence on the second, communication-based route has been more consistent. Several studies[15–17] found that clinician implicit bias was associated with worse clinical interactions with black patients. In our own work with the same clinicians and patient population studied here,[15] black patients reported less patient-centered treatment from clinicians who had higher levels of implicit bias. Communication issues are in and of themselves important, and other research suggests that lower quality communication is associated with less continuity of care, worse adherence and worse outcomes over time.[46–48] Research has yet to show, however, that the effects of bias on communication has these downstream effects. The null results obtained in the current study suggest that the bias-associated

Table 3. Multilevel Model Estimates and Standard Errors for Processes and Outcomes Associated with Hypertension Treatment

	Antihypertensive Treatment Intensification		Percent Days Antihypertensive Meds Covered		Percent Time BP at JNC7 Goal		Percent Time out of Stage 2 Hypertension	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Covariance Parameters								
Clinic	0.002	0.001	7.3	4.0	28.3	11.1	4.8	2.5
PCP	0.001	0.001	8.5	2.9	5.9	4.3	3.7	1.8
Residual	0.127	0.003	339.1	7.9	896.3	18.7	323.0	6.7
Fixed-Effect Parameters								
Intercept	−0.281	0.017	83.7	0.9	58.9	1.5	91.9	0.8
Male	0.018	0.013	0.1	0.6	−1.5	0.9	−0.9	0.6
60+ years	−0.003	0.014	6.0***	0.7	0.2	1.0	−0.4	0.6
Diabetes	−0.143***	0.013	0.3	0.6	−14.3***	0.9	0.8	0.6
CHF	0.078**	0.025	−3.2**	1.2	2.6	1.8	−0.3	1.1
CHD	0.057**	0.019	0.6	0.9	6.1***	1.3	1.5	0.8
CVD	−0.005	0.022	−0.1	1.1	2.9	1.6	−0.5	1.0
PVD	0.016	0.025	0.4	1.2	3.6*	1.8	−0.5	1.1
CKD	−0.173***	0.014	−0.6	0.7	−17.7***	1.0	−0.5	0.6
Black	−0.012	0.018	−7.5***	0.9	−3.9**	1.2	−4.6***	0.7
Black:White IAT	0.007	0.030	−3.8*	1.7	−1.9	2.2	−1.2	1.4
Race*IAT	−0.011	0.059	5.3	2.9	−4.1	4.1	3.2	2.5
Latino	0.016	0.015	−5.4***	0.7	0.3	1.1	−0.9	0.6
Latino:White IAT	0.014	0.024	1.3	1.4	2.3	1.8	−1.0	1.1
Ethnicity*IAT	0.022	0.038	−1.5	1.8	−0.7	2.6	−0.2	1.6

*Estimates different from zero, *p< 0.05, **p< 0.01, ***p< 0.0001*
*NOTE: Patient gender, age, comorbidities and race are dichotomous (0 or 1), and IAT scores are mean-centered. The intercept is the estimate for young, white females without comorbidities. Race*IAT is the interaction between patient race (black vs. white) and the Black:White IAT; Ethnicity*IAT is the interaction between patient ethnicity (Latino vs. white) and the Latino:White IAT*

Table 4. Predicted Outcomes for Black and Latino Patients Associated with a 1 SD Increase in Clinician Implicit Bias

Outcome	Black Patients		Latino Patients	
	Black:White IAT		Latino:White IAT	
	M Bias (IAT=0.30)	+1 SD Bias (IAT=0.59)	*M* Bias (IAT=0.32)	+1 SD Bias (IAT=0.70)
Treatment Intensification	−0.40	−0.40	−0.37	−0.36
Days Covered with Antihypertensive Medication	79.3 %	79.7 %	81.4 %	81.3 %
Time at JNC7 BP Goal	43.5 %	41.8 %	47.7 %	48.3 %
Time out of Stage 2 Hypertension	87.0 %	87.6 %	90.7 %	90.3 %
Systolic BP (mm HG)	134.8	134.7	132.8	133.0

NOTES: Predictions are adjusted for patients' age, gender and comorbidities (diabetes, CHF, CHD, CVD, PVD and CKD); white patients served as the reference group in each analysis. SBP is also adjusted for time. None of the predicted changes were statistically significant

communication problems we previously observed[15] did not translate into less intensive treatment, worse adherence or worse hypertension control for patients.

The conditions of our study identify some of the factors that may determine whether or not clinician bias contributes to ethnic/racial health disparities. Primary care has a number of features that are likely to mitigate the impact of bias. First is the opportunity in primary care for patients and clinicians to develop strong working relationships. The patients in our study received regular care from the same clinician for an average of nine visits across 3 years. Second, the processes and outcomes we examined were assessed over the course of years, with many opportunities for adjustment to address the patients' medical needs in ways that avoided the influence of bias. Third, there are strong expectations for meeting hypertension control guidelines in both of the organizations included in this study, and there is general awareness of the problem of uncontrolled hypertension, particularly among blacks. Finally, there are checks and balances that often occur in primary care teams (e.g., clinicians, nurses and pharmacists), particularly in the integrated health care systems we studied. Implicit bias may be more likely to affect care delivered outside of established relationships, or without teams or systems support, or in decisions made under time pressure, with limited information or without the benefit of clear guidelines.[33,49]

This study has several limitations. The results are limited to primary care clinicians and their patients with diagnosed hypertension who received regular care. The study results are also limited to the two largest minority groups in this geographic area (blacks and Latinos); there were not enough patients in other groups to include them in the analysis. Clinician implicit bias may have greater effects on care processes and outcomes under different conditions than those studied here, as outlined previously. Pharmacy fills provide only a proxy for clinicians' intentions for treatment intensification. Finally, the disparities in hypertension care between white, Black and Latino patients in these two delivery systems were small in magnitude; stronger effects of bias may be evident in settings with larger disparities in care.

CONCLUSIONS

The belief that clinician bias contributes to health care disparities is widespread, as reflected in the 2003 IOM report.[3] In a series of studies, we have shown that implicit bias is prevalent among clinicians,[12] and that it is reflected in the perceptions of black patients regarding their interpersonal treatment,[15] but in the primary care settings considered in the present study, it does not appear to affect treatment intensification, medication adherence or hypertension control. Together, these findings highlight the need to better understand the conditions under which bias may and may not affect health care. Careful studies are needed in other clinical domains to fully explore the potential influence of clinician bias on care outcomes.

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Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

Corresponding Author: *Irene V. Blair, PhD; Department of Psychology & Neuroscience, University of Colorado, UCB 345, Boulder, CO 80309, USA (e-mail: irene.blair@colorado.edu).*

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