

How Views of the Organization of Primary Care Among Patients with Hypertension Vary by Race or Ethnicity

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ABSTRACT Introduction: We assessed potential racial or ethnic differences in the degree to which veterans with pharmaceutically treated hypertension report experiences with their primary care system that are consistent with optimal chronic illness care as suggested by Wagner's Chronic Care Model (CCM). Materials and Methods: A cross-sectional analysis of the results of the Patient Assessment of Chronic Illness Care (PACIC), which measured components of the care system suggested by the CCM and was completed at baseline by participants in a hypertension disease management clinical trial. Participants had a recent history of uncontrolled systolic blood pressure. Results: Among 377 patients, non-Hispanic African American veterans had almost twice the odds of indicating that their primary care experience is consistent with CCM features when compared with non-Hispanic White patients (odds ratio (OR) = 1.86; 95% confidence interval (CI) = 1.16–2.98). Similar statistically significant associations were observed for follow-up care (OR = 2.59; 95% CI = 1.49–4.50), patient activation (OR = 1.80; 95% CI = 1.13–2.87), goal setting (OR = 1.65; 95% CI = 1.03–2.64), and help with problem solving (OR = 1.62; 95% CI = 1.00–2.60). Conclusions: Non-Hispanic African Americans with pharmaceutically treated hypertension report that the primary care system more closely approximates the Wagner CCM than non-Hispanic White patients.

INTRODUCTION

Approximately a third of adults in the United States have hypertension, including more than two-thirds of people over age 65 yr.¹ Despite significant evidence that controlling hypertension through diet, exercise, and/or medications improves cardiovascular and renal outcomes, fewer than half of Americans with hypertension have their blood pressure under control.^{1,2}

The Wagner Chronic Care Model (CCM) postulates that chronic illness management is optimized when health care systems have (1) established links to the community, (2) capacity to provide effective self-management support through delivery systems organized around teams, (3) clinical decision support, and (4) robust information technology systems.^{3,4} Having CCM elements in primary care and

disease management programs has been associated with better chronic illness process and outcomes,^{5–14} including blood pressure and cardiovascular disease risk.^{15–18}

The CCM serves as a basis for other robust models for organizing and delivering primary care, including the patient-centered medical home (PCMH).¹⁹ Over the past two decades, the Veterans Affairs (VA) health care system has evolved with specific links to the CCM and PCMH models,^{20,21} including the introduction of the patient-aligned care team (PACT) in 2010 as the basis of organizing primary care.^{22–24} The goal of the PACT is to improve the quality of care, including satisfaction, health care outcomes, and costs. Despite the fact that PACTs were not designed to specifically address racial or ethnic disparities in care and there has not been a specific emphasis on PACT implementation in sites of care with larger proportions of racial or ethnic minorities,²⁵ the VA does have a programmatic and research emphasis on reducing health disparities.^{26–28}

The reorganization of VA care has been accompanied by significant improvements in hypertension control. For example, control rates increased from 46% to 76% between 2000 and 2010. Despite improvements in control among both non-Hispanic Whites and African Americans, control rates consistently remained lower among African American compared with non-Hispanic White patients.²⁹

To fully reap the potential benefits of the CCM and related models, systems must reduce pervasive racial/ethnic disparities in the process and outcomes of care, including hypertension.^{1,30–32} One potential explanation for observed disparities is that racial and socioeconomic groups have

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different perceptions of, and interactions with, primary care.³³ Thus, we examined whether, among veterans with hypertension, racial/ethnic groups differ in their reported experiences with elements of the CCM.

METHODS

Overview

We conducted this study with eligible patients receiving primary care from three clinics associated with one VAMC. We utilized baseline data from patients enrolled between November 6, 2012 and April 9, 2015. The study was approved by the Durham VA Medical Center's institutional review board (IRB).

Eligible Patients

The parent study is a randomized trial that examines the impact of a disease management program that titrates the intensity of resources to patients' level of hypertension control (clinicaltrials.gov registration no. NCT01390272). Overall trial methods have been previously described.³⁴ Briefly, study subjects were English-speaking adult patients living in the community with access to a telephone, had been seen at a study clinic in the last year, reported that they consider their primary care provider to be at the VA, reported that they receive the majority of their health care from the VA, and had a history of pharmaceutically treated hypertension with uncontrolled systolic blood pressure during the year before identification of patients to approach for potential study enrollment. The definition of control was based on the Seventh Report of the Joint National Commission on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC-7) (≥ 140 mmHg for patients without diabetes and ≥ 130 mmHg for patients with diabetes),³⁵ which was the version of the guideline in place at the beginning of study enrollment.

Patients were excluded if they were enrolled in an ongoing clinical trial or clinical program that would be expected to impact blood pressure control, had type 1 diabetes, class IV congestive heart failure, end-stage renal disease, metastatic cancer, a history of solid organ or bone marrow transplantation, or a diagnosis of active psychosis at baseline. Women who reported being pregnant or planning to become pregnant over the next 18 mo were also excluded.

Measures

At study baseline (i.e., before the trial intervention began), we administered the validated 2005 version of the Patient Assessment of Chronic Illness Care (PACIC).³⁶ Although not hypertension specific, the PACIC measures patients' perceptions of their chronic illness care system that are mapped to the CCM.^{3,4,36,37} PACIC scores have been positively associated with patient-reported self-management resources and behaviors, medication adherence, quality of life, and satisfaction with health care.^{38,39} For a series of statements related

to their regular doctor or provider and affiliated clinicians who care for their chronic illness, patients were asked how often during the previous 6 mo time they had various experiences related to their care. Responses were on a 5-point Likert scale anchored by 1 (almost never) to 5 (almost always). The PACIC produced the following subscale scores: (1) patient activation, (2) delivery system design (care teams)/decision support, (3) collaborative goal setting, (4) collaborative problem solving/contextual counseling, and (5) follow-up/coordination. In addition, an overall PACIC summary score (i.e., overall fidelity to the CCM) was calculated. Scores range from 1 to 5 with higher scales indicating greater fidelity to the CCM.

The primary explanatory variable of interest was race or ethnicity [separate variables for non-Hispanic Black or African American and other race or ethnicity vs. non-Hispanic White or Caucasian (referent)]. Logistic regression models utilized for this study include the following variables/measures: (1) education level (high school or less vs. greater than high school), (2) gender (female vs. male), (3) age (continuous variable), (4) pharmaceutically treated diabetes vs. not having pharmaceutically treated diabetes, (5) whether the individual has a person with whom the veteran is close (proxy for social support) (have person whom the person is close vs. not having such a person), and (6) mean of three baseline study visit systolic blood pressure measurements taken 30 s apart in a seated position after waiting 5 min (continuous variable serving as an indication of level of disease control).

Data Analysis

For our primary analyses, PACIC scores ≥ 3.5 on each scale were considered to represent "presence of" CCM components. This cutoff was chosen because it represents the top quarter of the scale range and has been used previously to examine factors associated with presence of CCM components utilizing the PACIC.⁴⁰⁻⁴³ Sensitivity analyses were also done using scores of ≥ 3 and ≥ 4 as the cutoffs.

Separate logistic regression models were fit for each PACIC subscale and the overall PACIC score. The primary explanatory variable of interest was race or ethnicity (variables described above). Simple (unadjusted) and multivariable (adjusted) logistic regression models were fit with multivariable models including race and variables covering the following topics (measures described in detail above): (1) education level, (2) gender, (3) age, (4) diabetes status, (5) social support, and (6) baseline systolic blood pressure. We report odds ratios (OR) and 95% confidence intervals (CI). Analyses were done using SAS version 9.4 (SAS Institute, Inc., Cary, NC).

RESULTS

The analysis sample included 377 of 385 (98%) enrolled patients with complete baseline data on outcomes and explanatory variables. Reflecting the patient population seen

TABLE I. Characteristics of Patients Included in the Final Logistic Regression Models, $n = 377$

Characteristic	Mean (SD) or Percent
Race/ethnicity	
White or Caucasian (non-Hispanic)	32.1%
Black or African American (non-Hispanic)	61.0%
Other race or ethnicity	6.9%
High school education or less	34.7%
Male	92.3%
Age (yr)	63.6 (8.8)
Diabetes (pharmaceutically treated)	57.0%
Patients without a close personal relationship	10.1%
Systolic blood pressure (mmHg) ^a	143.8 (17.6)

SD, standard deviation.

^aMean of three baseline site visit systolic blood pressures taken in a seated position 5 min apart.

in the VA,⁴⁴ patients were predominantly older (mean age 63.6 yr) men (92.3%) (Table I). The majority of patients were non-Hispanic African Americans (61.0%). Non-Hispanic Whites and patients of other racial or ethnic backgrounds made up 32.1% and 6.9% of patients included in the analysis, respectively.

The mean PACIC summary score was 3.4 (SD=0.9); 48.3% of patients indicated implementation of the CCM (Table II). The mean PACIC subscale scores (Table II) ranged from 2.9 (follow-up) to 3.9 (delivery system design/care teams); the percentage of patients reporting CCM reflection ranged from 29.7% (follow-up) to 69.2% (delivery system design/care teams). These scores reflect a modest level of CCM implementation.

The unadjusted relationship between race or ethnicity and PACIC results are detailed in Table III. Non-Hispanic African Americans had higher odds of indicating that the chronic illness care system at the VA is in line with the CCM compared with non-Hispanic Whites (OR=1.75; 95% CI = 1.12–2.73). For all subscales, non-Hispanic African Americans had greater odds of reporting aspects of the care system being in line with the CCM. However, the associations did not reach statistical significance for delivery system design/care teams and assistance with problem solving. Significant associations were not observed when comparing the experience of individuals of other race or ethnicity with non-Hispanic White patients.

In adjusted models, non-Hispanic African American patients with hypertension had almost twice the odds of indicating that their experience with their regular VA health care team was consistent with the CCM (OR=1.86; 95% CI = 1.16–2.98) compared with non-Hispanic Whites (see Table III). Similar associations were seen for PACIC subscales comparing non-Hispanic African Americans with non-Hispanics Whites, including follow-up care (OR=2.59; 95% CI = 1.49–4.50), patient activation (OR=1.80; 95% CI = 1.13–2.87), goal setting (OR=1.65; 95% CI = 1.03–2.64), and help with problem

TABLE II. PACIC Results, $n = 377$

PACIC Scale	Scale Mean (SD) (Possible Range=1–5)	% of Patients Indicating CCM Implementation (Scale Score ≥ 3.5)
Patient activation	3.4 (1.1)	50.1
Delivery system design/ care teams	3.9 (0.9)	69.2
Goal setting	3.4 (1.1)	49.1
Problem solving	3.6 (1.1)	58.4
Follow-up	2.9 (1.1)	29.7
PACIC summary score	3.4 (0.9)	48.3

CCM, chronic care model; PACIC, patient assessment of chronic illness care; SD, standard deviation.

solving (OR=1.62; 95% CI = 1.00–2.60). Similar patterns were found with both unadjusted and adjusted models (see Table III). Although the association for delivery system design/care teams did not reach statistical significance, the odds ratio estimate was in a similar direction (OR=1.55; 95% CI = 0.94–2.55). Comparisons of concordance with CCM between other race or ethnicity and non-Hispanic Whites were not statistically significant (Table III).

The sensitivity analyses using PACIC score cutoffs of ≥ 3 or ≥ 4 (rather than 3.5) to indicate concordance generally produced similar results (results not shown). With a cutoff of ≥ 3 , associations indicating greater odds of reporting CCM concordance among non-Hispanic African Americans compared with non-Hispanic Whites were statistically significant for all PACIC scales. With a cutoff of ≥ 4 , associations indicating greater odds of reporting CCM concordance among non-Hispanic African Americans compared with non-Hispanic Whites were in the same direction for all PACIC scales; however, statistical significance was only achieved for patient activation, follow-up, and the overall summary score.

DISCUSSION

Compared with non-Hispanic Whites, non-Hispanic African American patients had nearly twice the odds of reporting that the chronic illness care system at the VA is consistent with the CCM. Significantly greater odds were reported for primary care supporting patient follow-up, activation, goal setting, and problem solving; the relationship was in the same direction for delivery systems being designed around teams but did not achieve statistical significance. These results are robust to sensitivity analyses based on different concordance cutoff scores and are adjusted for measures of age, gender, education, social support, diabetes status, and blood pressure.

This study is comparable with the one we conducted before the implementation of PACT. In 2006–2007, we surveyed a random sample of patients with diabetes treated at the same VA medical center. When comparing non-White

TABLE III. Logistic Regress Results – Association Between Chronic Care Model (CCM) Concordance and Race or Ethnicity, $n = 377$

PACIC Scale Implemented ^a	Non-Hispanic African American Vs. Non-Hispanic White		Other Race or Ethnicity Vs. Non-Hispanic White	
	Unadjusted	Adjusted ^{b,c}	Unadjusted	Adjusted ^{b,c}
	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)
Patient activation	1.78 (1.14–2.78)*	1.80 (1.13–2.87)*	1.71 (0.73–4.02)	1.74 (0.73–4.16)
Delivery system design/care teams	1.42 (0.89–2.27)	1.55 (0.94–2.55)	1.90 (0.71–5.10)	2.14 (0.78–5.86)
Goal setting	1.60 (1.03–2.50)*	1.65 (1.03–2.64)*	1.42 (0.61–3.32)	1.39 (0.58–3.33)
Problem solving	1.49 (0.96–2.33)	1.62 (1.00–2.60)*	0.76 (0.33–1.79)	0.86 (0.36–2.07)
Follow-up	2.45 (1.45–4.15)*	2.59 (1.49–4.50)*	1.01 (0.35–2.98)	0.93 (0.30–2.81)
PACIC summary score	1.75 (1.12–2.73)*	1.86 (1.16–2.98)*	1.12 (0.47–2.63)	1.14 (0.47–2.76)

* $p < 0.05$.

CI, confidence interval; PACIC, Patient Assessment of Chronic Illness Care.

^aCCM implementation = PACIC score ≥ 3.5 .^bSeparate adjusted models included the primary explanatory variable of interest, which was race or ethnicity [separate variables for non-Hispanic Black or African American and other race or ethnicity vs. non-Hispanic White or Caucasian (referent)]. Results were also adjusted for (1) education level, (2) gender, (3) age, (4) diabetes status, (5) social support, and (6) baseline systolic blood pressure.^cc-Statistics for adjusted models range from 0.60 (patient activation) to 0.70 (follow-up).

(predominantly African American) and White patients, non-White patients had more than twice the odds of reporting that the chronic illness care system was in line with the CCM (OR=2.28).⁴⁰ Additionally, a 2013 study of VA patients with multiple chronic conditions from around the VA system conducted by Balbale et al found that non-White patients were more likely than White patients to have a PACIC score of ≥ 3.5 . However, the estimated odds ratio in that study was modest (OR=1.19).⁴³

PACIC scores were modestly higher in the present study than in the study from 2006 to 2007. The mean PACIC summary score in the present study was 3.4, and 48.3% of patients had a score of ≥ 3.5 . By contrast, the equivalent numbers in the previous study were 3.1 and 43.9%, respectively. A larger percentage of patients in the present study reported scores ≥ 3.5 on the delivery system organized around teams (8.3 percentage points more in the present study), follow-up care (5.4 percentage points more in the present study), goal setting (3.6 percentage points more in the present study), and problem solving (2.8 percentage points more in the present study). There was essentially no difference in the percentage of patients reporting patient activation. The larger percentage of patients reporting concordance with CCM especially on the delivery system design/care teams domain may be reflective of an impact of the VA efforts to reorganize into patient-aligned care teams (PACTs).²²

There are multiple possible explanations for our findings concerning the association between non-Hispanic African American race/ethnicity and PACIC scores. First, the VA primary care clinics may pay additional attention to the needs of African American patients with hypertension. This possibility is supported by evidence from a separate clinical trial conducted at the same medical center indicating that African Americans were more likely than Whites to consider hypertension to be a serious condition and to have the related symptom of increased urination. This may either result in

increased attention on the part of providers or be the result of such attention to hypertension.⁴⁵ Further, results for a different VA tertiary care medical center indicated that providers were more involved in advising African American than White patients concerning hypertension and medication adherence.⁴⁶ Second, the VA has made significant attempts to transform the primary care system according to the PCMH model^{22–24} and has generally had lower levels of racial disparities in diabetes-related care processes than the rest of the US health care system.⁴⁷ This may be reflected in the fact that PACIC results at this medical center indicated a greater degree of organization around teams than was seen among diabetes patients before the transition to the PCMH model.⁴⁰ Third, it is possible that lower levels of trust in the health care system^{48,49} and health research in general⁵⁰ or perceived discrimination by the health care system⁵¹ may have led to a response bias in which non-White patients were not as trusting that answers would remain confidential or not impact their care. However, this does not appear likely because these patients consented to be enrolled in a clinical trial focused on hypertension disease management.

This study has some important limitations and considerations. The study was conducted among patients of clinics associated with a single tertiary care VAMC, which may limit generalizability. However, an association has been observed between race and PACIC scores among VA patients in other settings.⁴³ Second, even if representative of VAMCs, findings may not be generalizable beyond the VA, a highly integrated delivery system that serves predominantly older men who are socioeconomically vulnerable.⁵² Third, the PACIC is not hypertension specific. As a result, experiences related to conditions other than hypertension may have impact PACIC results. Finally, our sample included patients reporting having a regular primary care provider. Thus, the results may not generalize to patients with poor access to or high dissatisfaction with VA health care.

CONCLUSION

Non-Hispanic African Americans with pharmaceutically treated hypertension report that the primary care system more closely approximates the Wagner CCM than non-Hispanic White patients. This finding is consistent with results from a study among patients with diabetes at the same VA medical center almost a decade earlier. Future research should focus on identifying the elements of health care organizations that allow these organizations to successfully offer all patients, including traditionally disadvantaged patients such as minorities and those with low socioeconomic status, the type of integrated primary care that will allow them to address their individual self-management needs.

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