



Racial/Ethnic Disparities in Diabetes Care and Outcomes: A Mixed Methods Study

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## Racial/Ethnic Disparities in Diabetes Care and Outcomes: A Mixed Methods Study

### Abstract

Limited research has examined racial/ethnic differences in diabetes care and outcomes among primary care patients. This study examined racial/ethnic differences in diabetes care and outcomes among an ambulatory patient population and explored patient perceptions of the patient-provider relationship to inform strategies to improve care delivery. Using data from 62,149 adults with diabetes who received care within Atrium Health in 2013, regression models assessed associations between race/ethnicity and the following outcomes: glycated hemoglobin (HbA1c) tests, low density lipoprotein (LDL) and blood pressure (BP) screening, foot and eye exams, and HbA1c, LDL, and BP control. Eleven patients with diabetes and uncontrolled hypertension participated in three focus groups about their perceptions of the patient-provider relationship. Compared to non-Hispanic Whites, non-Hispanic Blacks had 22% to 73% higher odds of receiving screenings (HbA1c, LDL, BP, foot and eye exams); p

### Keywords

diabetes mellitus; health disparities; patient-provider relationship; quality of care; mixed methods research

### Cover Page Footnote

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## **Racial/Ethnic Disparities in Diabetes Care and Outcomes: A Mixed Methods Study**

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### **ABSTRACT**

Limited research has examined racial/ethnic differences in diabetes care and outcomes among primary care patients. This study examined racial/ethnic differences in diabetes care and outcomes among an ambulatory patient population and explored patient perceptions of the patient-provider relationship to inform strategies to improve care delivery. Using data from 62,149 adults with diabetes who received care within Atrium Health in 2013, regression models assessed associations between race/ethnicity and the following outcomes: glycosylated hemoglobin (HbA1c) tests, low density lipoprotein (LDL) and blood pressure (BP) screening, foot and eye exams, and HbA1c, LDL, and BP control. Eleven patients with diabetes and uncontrolled hypertension participated in three focus groups about their perceptions of the patient-provider relationship. Compared to non-Hispanic Whites, non-Hispanic Blacks had 22% to 73% higher odds of receiving screenings (HbA1c, LDL, BP, foot and eye exams;  $p < 0.05$ ) and 25% to 36% lower odds of HbA1c, LDL or BP control ( $p < 0.05$ ). Focus group participants indicated that good communication and continuity in their relationships with providers played a key role in management of their diabetes. Findings suggest that strategies to strengthen partnerships between patients and their clinical teams, increase self-management support and utilize shared-decision making may help to improve outcomes for minority patients.

**Keywords:** diabetes mellitus; health disparities; patient-provider relationship; quality of care; mixed methods research

## INTRODUCTION

Despite improvements in diabetes care, racial and ethnic minorities experience higher diabetes prevalence and worse diabetes-related outcomes. In the U.S., diabetes is most prevalent among Native Americans (15.9%), non-Hispanic Blacks (13.2%) and Hispanics (12.8%) (Centers for Disease Control and Prevention, 2014). Comparatively, only 7.6% of non-Hispanic Whites have the disease (Centers for Disease Control and Prevention, 2014). Diabetes mortality and complications including retinopathy, neuropathy and nephropathy are also higher in minority populations compared to non-Hispanic Whites (Spanakis & Golden, 2013). Projections that 28% of Americans will have diabetes by 2050 (Boyle, Thompson, Gregg, Barker, & Williamson, 2010) warrant attention to improve diabetes management for all patients and reduce disparities that exist for minority populations.

Quality improvement efforts aimed at addressing racial and ethnic disparities in diabetes aim to improve diabetes processes of care (i.e. eye and foot exams and regular checks of blood glucose, cholesterol and blood pressure) and intermediate diabetes outcomes (i.e. control of blood glucose, cholesterol and blood pressure) to prevent complications that can lead to blindness, lower extremity amputations and death (Baig et al., 2010; Peek, Cargill, & Huang, 2007). While some studies report higher rates of appropriate diabetes care for non-Hispanic Blacks compared to non-Hispanic Whites (Chen, Cheadle, Johnson, & Duran, 2014; Gala & Wu, 2014), others report that both non-Hispanic Blacks and Hispanics are less likely to receive recommended preventive care for diabetes (Meng et al., 2016). Trend data suggest that although overall rates of diabetes control have increased, differences between minorities and non-Hispanic Whites have remained and, in some cases, widened (Selvin, Parrinello, Sacks, & Coresh, 2014; Stark Casagrande, Fradkin, Saydah, Rust, & Cowie, 2013). Healthcare systems can benefit from identifying where differences exist as well as the factors contributing to those differences (Joseph, Johnson, Wholey, & Frederick, 2015; McPheeters et al., 2012; Schmittdiel et al., 2017). The chronic care model for improving the quality of chronic disease care advocates “productive patient-provider interactions,” which are characterized by a focus on patient needs and values, patient perspectives, facilitating goal-setting and ensuring follow-up (Wagner, 2000). Some factors that may limit the positive effects of the clinical encounter for minority patients include poor patient-provider communication, language barriers, low health literacy, limited shared decision making, discrimination and distrust (Arnett, Thorpe, Gaskin, Bowie, & LaVeist, 2016; Peek et al., 2009; Schmittdiel et al., 2017). Recent studies limited to analyses of quantitative data from general populations that may or may not be engaged in routine care for diabetes (Chen et al., 2014; Heisler et al., 2007; Joseph et al., 2015; Selvin et al., 2014; Stark Casagrande et al., 2013) have not explored patient perceptions of their relationship with their care providers in the context of achieving quality goals.

The current study aimed to examine whether racial/ethnic differences exist in receipt of recommended preventive care and outcomes for diabetes in an ambulatory patient population. Our secondary objective was to explore patient perceptions regarding the role of patient-provider relationships in diabetes care with a focus on similarities and differences by race/ethnicity. We hypothesized that non-Hispanic Blacks and Hispanics would have worse diabetes outcomes compared to non-Hispanic Whites after adjustments for patient characteristics and that Hispanics would have less preventive care for diabetes. This study adds to existing literature by using data

from a large integrated healthcare system to examine whether minority patients differ from non-Hispanic Whites in achieving targets for quality diabetes care and related outcomes for diabetes control. Using a mixed methods approach, we also explored patient perspectives of the patient-provider relationship, a significant factor impacting diabetes care. While prior studies have used a mixed methods approach to examine health outcomes and perceptions of diabetes care among adults with diabetes who were involved in specific interventions (Burner, Menchine, Taylor, & Arora, 2013; Islam et al., 2012; Nundy et al., 2014), the current study is distinguished by a focus on examining routine clinical assessments to inform strategies for improvement.

## **METHODS**

### Study Design and Setting

This study was conducted within Atrium Health, a large vertically integrated healthcare system based in Charlotte, North Carolina, that includes a network of over 180 primary care practices and several academic medical centers, hospitals, and long-term care facilities. We used a mixed methods approach that involved analysis of cross-sectional quantitative data on healthcare use and outcomes and qualitative data from focus groups. Focus groups explored patient perceptions of the patient-provider relationship in diabetes care and the similarities and differences in those perceptions by race/ethnicity. The Atrium Health Institutional Review Board approved this study.

### Data and Participants

Data on healthcare use and outcomes in 2013 were obtained from electronic medical records. Data were extracted using Optum One® (Optum, Eden Prairie, MN), a healthcare data integration and analytics platform, that combines medical record data from inpatient and outpatient care settings to inform metrics for population health management. The cohort of patients with diabetes was identified based on diagnosis codes (International Classification of Diseases 9<sup>th</sup> Revision [ICD-9] diagnosis code of 249.xx, 250.xx, 790.2x, 362.0x, 357.2x, 366.41, 648.0x, 648.8x), lab values ( $\geq 2$  random glucose tests with values  $\geq 200$  mg/dl,  $\geq 1$  glucose 2-hour tests with result  $\geq 200$  mg/dl,  $\geq 1$  fasting glucose tests with result  $\geq 126$  mg/dl,  $\geq 1$  glycated hemoglobin (HbA1c) tests with result  $\geq 6.5\%$ ) or diabetes medications prescribed in ambulatory settings (alpha-glucosidase inhibitors, antidiabetic-amylin analogs, antidiabetic combinations, biguanides, dipeptidyl peptidase-4 inhibitors, dopamine receptor agonists-antidiabetic, incretin mimetic agents, insulin, insulin sensitizing agents, meglitinide analogues, sulfonylureas). Adult patients with diabetes receiving care in the outpatient setting in the previous 12 months were included (n=62,149).

### Measures

We examined five preventive care measures and five disease outcomes measures for patients with diabetes. We used existing binary (yes/no) variables that indicated whether patients received recommended preventive care at least once in the previous 12 months: foot and eye exams, lipid profiles, blood pressure checks, and HbA1c tests (American Diabetes Association, 2017). Diabetes outcome measures included two targets for glycemic control (HbA1c $<8\%$  indicating good control and HbA1c $>9\%$  indicating poor control), two targets for blood pressure control (BP $<140/90$  mmHg and BP $<130/80$  mmHg) and one target for cholesterol control (low density lipoprotein [LDL] cholesterol $<100$  mmHg) (American Diabetes Association, 2017). Other

data included patient age, gender, insurance and race/ethnicity. Race/ethnicity was classified as non-Hispanic White, non-Hispanic Black, Hispanic or other (which included Asians, American Indians/Alaskan Natives, Native Hawaiian or other Pacific Islanders, those belonging to multiple races, and those with unknown race). Insurance was classified as Medicaid, Medicare, commercial or other (including charity and unknown insurance).

#### Statistical Analysis

Patient demographics were summarized using means and percentages as appropriate for the overall sample and by race/ethnicity. Chi-square tests and analysis of variance compared sample characteristics by race/ethnicity. Multivariate logistic regression models compared differences in diabetes care and outcome measures by patient race/ethnicity. Models were adjusted for age, gender and insurance. Results were reported as adjusted odds ratios (AOR) and 95% confidence intervals (CI). All tests were two-sided. P-values < 0.05 indicated significance. Statistical analyses were conducted using SAS version 9.3 (SAS Institute, Cary, NC).

#### Focus Groups with Patients

Qualitative data were obtained from focus groups with patients that explored their perceptions of: the role of culture in their care; the role they play in decisions about their diabetes treatment; their communication with their providers; the interactions they have with their providers; and the types of barriers to care that they face. Between February and November of 2016, we conducted three focus groups with adult patients attending a family medicine clinic within the healthcare system network that was designing strategies to understand and reduce disparities in blood pressure control among non-Hispanic Black patients with diabetes. Two focus groups were conducted with non-Hispanic Black patients (n=7) and one focus group was conducted with non-Hispanic White patients (n=4). Eligible adult patients had a diagnosis of diabetes and uncontrolled hypertension in 2016. Patients were recruited by phone by a member of the clinic staff from a list of all eligible patients at the clinic. Each participant received a \$20 incentive. Audio recordings of the focus groups were transcribed and a codebook was developed based on the transcripts. Two researchers coded a sample of the transcripts. Based on a high level of reliability (Cohen's Kappa = 0.84), the codebook was used by one researcher who coded all transcripts and summarized the findings. Both researchers reviewed and discussed these summaries to reconcile any differences in interpretation.

## **RESULTS**

### Sample Characteristics

The racial/ethnic makeup of the retrospective cohort of patients with diabetes included non-Hispanic Whites (66.8%), non-Hispanic Blacks (21.9%), Hispanics (1.4%), and other racial/ethnic groups (9.9%), with a mean age of 58.3 (standard deviation [SD]=11.8) (Table 1). Non-Hispanic Blacks and Hispanics were younger than non-Hispanic Whites on average and were more likely to have Medicaid insurance. Chi-square tests showed that non-Hispanic Blacks had a significantly lower percentage of males compared to Whites (37.9% vs. 52.2%, p<0.001).

### Healthcare Use and Outcomes

Most of the sample received annual preventive screenings for HbA1c (84.3%), LDL (75.4%) and blood pressure (84.9%) (Table 2). Non-Hispanic Black and Hispanic patients had greater adjusted odds of receiving HbA1c, LDL and blood pressure screenings compared to non-Hispanic Whites.

**Table 1.** Sample demographics, adult ambulatory patients with type 1 or type 2 diabetes in 2013 (n=62,149)

	All (n= 62,149)	Non- Hispanic White (n= 41,542)	Non- Hispanic Black (n= 13,591)	Hispanic (n= 860)	Other <sup>a</sup> (n= 6,156)	p-value <sup>c</sup>
Age, mean (SD)	58.3 (11.8)	59.2 (11.6)	56.4 (11.8)	55.2 (12.7)	57.0 (12.4)	<0.001
Gender, %						<0.001
Male	49.2	52.2	37.9	47.9	53.7	
Female	50.8	47.8	62.1	52.1	46.3	
Insurance, %						<0.001
Medicaid	6.4	4.8	11.1	12.8	6.0	
Medicare	45.8	47.6	44.4	33.3	38.1	
Commercial	47.0	47.0	43.0	52.2	54.7	
Other <sup>b</sup>	0.9	0.7	1.5	1.7	1.2	

<sup>a</sup>Other race includes Asians, American Indians/Alaskan Natives, Native Hawaiian/Pacific Islanders, those belonging to multiple races, and those with unknown race/ethnicity.

<sup>b</sup>Other insurance includes charity and unknown insurance.

<sup>c</sup>P-values comparing patient characteristics by race/ethnicity from chi-square or analysis of variance tests.

SD, standard deviation

Rates for foot exams (54.9%) and eye exams (32.9%) were lower among the sample than other types of preventive care. Still, non-Hispanic Blacks had 44% (AOR: 1.44; 95% CI: 1.39-1.50) and 22% (AOR: 1.22; 95% CI: 1.17-1.27) higher odds, respectively, of receiving a foot exam or eye exam compared to non-Hispanic Whites. Hispanic patients had 34% higher adjusted odds (AOR: 1.34; 95% CI: 1.17-1.54) of receiving a foot exam compared to non-Hispanic White patients, while rates of eye exams did not differ significantly between the two groups (AOR: 1.08; 95% CI: 0.94-1.25).

Results comparing diabetes outcomes by race/ethnicity showed a different pattern than preventive care measures (Table 3). Compared to non-Hispanic Whites, non-Hispanic Black patients had 25% lower adjusted odds of good glycemic control as measured by HbA1c<8% and 58% higher odds of poor glycemic control as measured by HbA1c>9%. Similarly, odds of achieving normal blood pressure levels were 34% to 36% lower for non-Hispanic Blacks compared to non-Hispanic Whites. Non-Hispanic Black, Hispanic, and patients of other races all had significantly lower odds of achieving targets for cholesterol control compared to non-Hispanic Whites.

**Table 2.** Percent of patients receiving preventive care for diabetes by race/ethnicity, adult ambulatory patients with type 1 or type 2 diabetes in 2013 (n=62,149)

Preventive Care	Non-Hispanic White (n= 41,542)	Non-Hispanic Black (n= 13,591)		Hispanic (n= 860)	Other <sup>a</sup> (n= 6,156)		
	%	%	AOR <sup>b</sup>	%	AOR <sup>b</sup>	%	AOR <sup>b</sup>
Annual HbA1c test	83.1	89.2	1.66 (1.57-1.77)***	89.8	1.73 (1.38-2.15)***	81.3	0.87 (0.81-0.93)***
Annual LDL check	74.6	79.0	1.37 (1.30-1.43)***	79.5	1.41 (1.19-1.67)***	72.5	0.92 (0.86-0.98)**
Annual BP check	83.4	90.0	1.73 (1.62-1.84)***	91.1	1.93 (1.53-2.45)***	83.5	0.98 (0.91-1.05)
Annual Foot Exam	53.2	61.1	1.44 (1.39-1.50)***	59.9	1.34 (1.17-1.54)***	51.5	0.93 (0.88-0.98)**
Annual Eye Exam	32.2	35.4	1.22 (1.17-1.27)***	32.8	1.08 (0.94-1.25)	32.2	1.02 (0.96-1.08)

<sup>a</sup>Other race includes Asians, American Indians/Alaskan Natives, Native Hawaiian or other Pacific Islanders, those belonging to multiple races, and those with unknown race.

<sup>b</sup>Adjusted odds ratio from logistic regression models adjusted for age, gender, and insurance, with non-Hispanic White as the reference category.

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

AOR, adjusted odds ratio; HbA1c, glycated hemoglobin; LDL, low density lipoprotein; BP, blood pressure

**Table 3.** Percent of patients meeting targets for diabetes outcomes by race/ethnicity, adult ambulatory patients with type 1 or type 2 diabetes in 2013 (n=62,149)

	Non-Hispanic White (n= 41,542)	Non-Hispanic Black (n= 13,591)		Hispanic (n= 860)		Other <sup>a</sup> (n= 6,156)	
<b>Outcome Measures</b>	%	%	AOR <sup>b</sup>	%	AOR <sup>b</sup>	%	AOR <sup>b</sup>
HbA1c<8%	65.0	63.5	0.75 (0.71-0.78) ***	66.1	0.89 (0.75-1.05)	62.5	1.01 (0.94-1.09)
HbA1c>9%	10.2	17.0	1.58 (1.49-1.67) ***	15.3	1.26 (1.02-1.54) *	11.9	1.03 (0.94-1.13)
LDL< 100 mg/dL	65.6	55.9	0.75 (0.72-0.79) ***	57.2	0.79 (0.67-0.92) **	60.2	0.84 (0.78-0.89) ***
BP<130/80 mmHg	38.7	30.1	0.66 (0.63-0.69) ***	41.0	1.09 (0.94-1.26)	38.3	0.99 (0.93-1.05)
BP<140/90 mmHg	72.0	63.5	0.64 (0.62-0.67) ***	75.1	1.11 (0.94-1.31)	72.5	0.99 (0.93-1.06)

<sup>a</sup>Other race includes Asians, American Indians/Alaskan Natives, Native Hawaiian or other Pacific Islanders, those belonging to multiple races, and those with unknown race.

<sup>b</sup>Adjusted odds ratio from logistic regression models adjusted for age, gender, and insurance, with non-Hispanic white as the reference category.

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

AOR, adjusted odds ratio; HbA1c, glycated hemoglobin; LDL, low density lipoprotein; BP, blood pressure

### Findings from Focus Groups with Patients

Analysis of data from focus group discussions with patients identified key themes in the following categories: perceptions of treatment of their diabetes, perceptions of their experiences with their providers, perceptions of patient-provider communication, and perceptions of the impact of their providers' level of cultural sensitivity on their patient experience. Thematic analysis revealed that non-Hispanic Black patients and non-Hispanic White patients share similar perceptions regarding what they value in the treatment of their diabetes, their experiences with their providers and how they want to communicate with their providers (Figure 1). Thematic analysis also revealed that non-Hispanic Black patients did not perceive their providers' level of cultural sensitivity as having an impact on their patient experience.

*Perceptions of Diabetes Treatment.* A key theme that emerged was that patients felt included in decisions about the treatment of their diabetes because providers talked with them about their treatment and listened to their feedback and opinions regarding their treatment. They valued this type of communication because they perceived it as playing an important role in the development of a good patient-provider relationship. One study participant explained:

*"... I feel included because I have a say-so... I just think [that] communication on both sides is what makes it a decent relationship."* (non-Hispanic Black patient)

*"Well, my physician has asked me if...I'm willing to try this."*

(non-Hispanic White patient)

Another key theme that emerged was that patients value providers who know their medical history. Patients associated good healthcare treatment with going to a usual place for care (same provider or practice) and going to a provider who knows their medical history. For example, they explained that:

*"You don't have to explain [yourself] over and over again to someone different.... That person already knows you, has been with you, and they kind of know what's going on with you."*

(non-Hispanic Black patient)

*"You can't see a different doctor every time you go. You can't get... care that way."*

(non-Hispanic Black patient)

*"...I like seeing the same doctor...instead of jumping all over.... How is one doctor...going to know what...kind of person you are?"*

(non-Hispanic White patient)

Furthermore, patients shared an understanding that they need to take an active daily role in managing their diabetes in partnership with their provider.

*"I know I need to be more aggressive about my health care than I used to be. Instead of just taking a pill and going on about my business."*

(non-Hispanic Black patient)

*"That doctor can't hold your hand every day [and] all day long. So, it's still up to you."*

(non-Hispanic Black patient)

**Figure 1.** Themes emerging from focus groups with patients with diabetes and uncontrolled hypertension regarding their perceptions of the patient-provider relationship



<sup>a</sup>Based on responses from non-Hispanic Black patients only. All others based on responses from non-Hispanic Black and White patients.

*“I think you have to be honest with your doctor for him to be able to treat you and then you have to do your part as [far as] following his instructions.”*

(non-Hispanic White patient)

*Perceptions of Experiences with Providers.* Thematic analysis revealed that patients valued having a consistent provider to help them manage their disease. Patients perceived that going to the same provider or location for treatment would provide consistency in treatment, a better patient-provider relationship and better patient-provider communication. For example, they explained that when you go to the same provider or the same location:

*“It builds up confidence...and you learn to trust him.”*

(non-Hispanic White patient)

*“He knows your condition and you don’t have to keep running from one doctor to another one.... He has your chart and he has everything.”*

(non-Hispanic Black patient)

*Perceptions of Patient-Provider Communication.* Patients perceived that good patient-provider communication plays a key role in disease management. They valued the following as important aspects of good patient-provider communication: providers help patients to understand their treatment by using words that are easy for them to understand; and providers allow patients to share their thoughts and concerns about their treatment. Patients explained the importance of these values by noting:

*“They are not using all of those medical terms. **They’re talking to you on your level...**”*

(non-Hispanic Black patient)

*“They sit there and they listen to you.”*

(non-Hispanic White patient)

*“Going along with what they suggest is easier **because they tell you, ‘Why.’**”*

(non-Hispanic Black patient)

*“I came in and brought my blood sugar readings and he looked at them and he said, ‘Well, we can cut back on this medication because [of] your blood sugar reading.’ I said, ‘Why stop it when it’s working?’ So, he left me on it. I was afraid [that] if I came off of it, my blood sugar reading may go up a little...I’m still on it.”*

(non-Hispanic White patient)

*“**The doctors in this office are good for explaining that. Other doctors [that] I’ve had before, he [would] come in [to] your room for ten minutes and...an hour and half later, he [would] come back and see [you] and wouldn’t explain nothing [to you].**”*

(non-Hispanic White patient)

*“**But, if you have something negative [in your communication]... And that would be them [the provider] not listening to your needs and your wants, that would affect it [the communication with the provider] negatively. But, if you’re in good standing with your doctor, then it’s [the communication] all good.**”*

(non-Hispanic Black patient)

*Perceptions of Impact of Providers' Level of Cultural Sensitivity.* We asked non-Hispanic Black patients if they thought that their providers' level of cultural sensitivity had an impact on their patient experience. A key theme that emerged was that these patients did not perceive their provider's level of cultural sensitivity as having an impact on the quality of care that they were receiving. They explained that their providers focus on the treatment of their condition and not their ethnicity during their interactions with them. One study participant explained:

*"I [have] never dealt with anything that was related to [him] not being sensitive... I just haven't had that issue with him because we talk about basic medical stuff."*

(non-Hispanic Black Patient)

However, some of the non-Hispanic Black patients reported that they would like to receive information from their provider that would help them to better understand how diabetes affects patients with their racial/ethnic background. For example, one patient explained:

*"I never hear anything related to, 'As an African American, you should really be aware that you shouldn't...have a lot of salt intake.... I never hear any explanation of how it's affecting me because of that particular background. You know that might be a good class to offer to African Americans..."* (non-Hispanic Black Patient)

## DISCUSSION

Preventive screenings and monitoring of lab values are standard components of diabetes care that allow providers to identify and address precursors of diabetes complications (American Diabetes Association, 2017). In this mixed methods study, our primary finding was that while non-Hispanic Black and Hispanic patients had higher odds of preventive care for diabetes, they had lower odds of achieving targets for good glycemic and cholesterol control. We also learned that regarding perceptions of diabetes care and the patient-provider relationship, both non-Hispanic Black and non-Hispanic White patients valued having a consistent provider to help them manage their diabetes, being included in decisions regarding their treatment and having providers who help them to understand information by using words that are easy to understand. Non-Hispanic Black patients also reported an interest in learning more from their providers about the impact of diabetes on patients who share their racial/ethnic background. These findings help us to better understand gaps that exist in health outcomes for minority populations with diabetes, how to improve patient-provider communication and the quality of patient experiences, and how to better engage patients in their care.

Our finding of higher odds of preventive care procedures among non-Hispanic Blacks compared to non-Hispanic Whites is consistent with prior research. Using national survey data, Chen et al. (2014) found that non-Hispanic Blacks had higher rates of eye exams and foot exams compared to non-Hispanic Whites. However, unlike our findings, the authors found that Hispanics with diabetes were less likely to receive HbA1c tests and foot exams compared to non-Hispanic Whites (Chen et al., 2014). Differences in our results could be attributed to the population studied. Our sample included patients who had been seen by a doctor in the previous 12 months. Non-Hispanic Black patients with diabetes are less likely to have physician office visits compared to their non-Hispanic White counterparts (Taylor, Spencer, Mahabaleshwarkar, & Ludden, 2017).

Hispanics with diabetes are also less likely to have a usual source of care than non-Hispanic Whites, and those who do are more likely to indicate a hospital based facility versus an office or an individual doctor (Hu, Shi, Liang, Haile, & Lee, 2016). Having a regular provider has been associated with higher rates of preventive care among non-Hispanic Whites, non-Hispanic Blacks and Hispanics (Kurian & Borders, 2006). Connecting Hispanics with diabetes to a usual source of preventive care may help improve their rates of recommended tests and screenings.

Our findings of poorer diabetes outcomes for Hispanics and non-Hispanic Blacks compared to non-Hispanic Whites are also consistent with prior research. A study of a nationally representative sample of adults aged 55 and older found that non-Hispanic Blacks and Hispanics had worse glycemic control (Heisler et al., 2007). Other data have shown that non-Hispanic Black and Mexican American adults have lower rates of glycemic control regardless of medication use (Selvin et al., 2014). Non-Hispanic Black adults were also less likely to have blood pressure control, while both non-Hispanic Blacks and Hispanics were less likely to have lipid control in a similar study using national samples (Stark Casagrande et al., 2013). Factors, such as medication adherence, genetics, patient activation and the type of diabetes therapy, may explain some of these differences (American Diabetes Association, 2017; Duru et al., 2009; Lafata et al., 2016; Parchman, Zeber, & Palmer, 2010). Failure to reach these targets among the ambulatory sample used in our study suggests opportunities to redesign care to address these gaps. Increasing self-management education and support, addressing social determinants of health, and leveraging clinical information systems to facilitate outreach and interventions are some recommended strategies for helping patients achieve their goals (American Diabetes Association, 2017; Chen et al., 2014; Kaplan, Billimek, Sorkin, Ngo-Metzger, & Greenfield, 2013; Schmittdiel et al., 2017).

Our discussions with patients revealed several patient values that did not differ between non-Hispanic Black and White patients with diabetes and uncontrolled hypertension. Results suggest that both non-Hispanic Black and White patients value having a good relationship and good communication with their provider and having a usual location where they receive treatment. Both groups of patients perceive the absence of these factors as impediments to their ability to manage their disease. Despite sharing these values, research indicates that achievement of these and other valued aspects of care are less likely for minority patients. For example, non-Hispanic Blacks are more likely than non-Hispanic Whites to report having poor communication with their healthcare providers (Agency for Healthcare Research and Quality, 2016) and less likely to report having a regular primary care provider (Arnett et al., 2016). Therefore, there remains a need to better understand the factors that cause these disparities.

Our findings support those of other studies that found that factors such as trust in the physician and physician-patient communication are associated with diabetes care and outcomes (Fernandez, Seligman, Quan, Stern, & Jacobs, 2012; Kokanovic & Manderson, 2007; Kutob et al., 2013). Research among patients with hypertension has suggested that racial and ethnic differences in clinical outcomes may be reduced among patients who have established patient-provider relationships in settings where implicit biases do not affect treatment decisions (Blair et al., 2014). However, minority patients with diabetes are less likely to have physician office visits and more likely to use the emergency department for diabetes-related causes when compared to non-Hispanic Whites (Taylor et al., 2017). Minority patients with diabetes are also less likely to have providers that engage them in shared decision making (Peek et al., 2013; Peek et al., 2010). Efforts

to reduce mistrust and engage these patients in a long-term relationship with a primary care provider may help reduce these gaps (Arnett et al., 2016; Taylor et al., 2017). In our results, the perception of Non-Hispanic Black patients that their providers' level of cultural sensitivity was not impacting their healthcare quality may reflect the fact that these patients had an established primary care provider relationship at a primary care practice that was engaged in efforts to reduce health disparities.

Our study had limitations. We did not have data on medication use. Therefore, regression models assessing differences in diabetes outcomes by race did not control for diabetes therapy. Prior studies examining the role of type of diabetes therapy and medication adherence in disparities in diabetes outcomes suggest that these disparities persist among patients receiving treatment irrespective of these factors (Heisler et al., 2007; Lafata et al., 2016). Focus groups with patients were conducted at a single primary care practice that was engaged in efforts to reduce disparities in diabetes outcomes and included only non-Hispanic Black and non-Hispanic White patients. While studies involving Hispanic patients have identified similar themes as we did regarding trust and patient-provider communication (Cersosimo & Musi, 2011; Fernandez et al., 2012), additional discussions with Hispanic and other minority patients would be useful for understanding differences in diabetes care relevant to the local healthcare and geographical context in the areas where these patients live.

Our study also had several strengths. We used a mixed methods approach to examine diabetes care and management in an ethnically diverse sample. Using data from a large sample of patients receiving care in the ambulatory setting, we identified specific gaps in targets for diabetes outcomes that highlight a potential need for new approaches to managing diabetes among minorities. By exploring patient perspectives of the patient provider relationship in their care, we discovered insights regarding how patients perceive their role in their own care and how clinical teams can better support them in that role. These findings can help inform quality improvement strategies and interventions for patients.

## **CONCLUSION**

Diabetes is a complex disease that requires ongoing management to reduce the risk of complications and death. We found that while minority patients receiving care in an ambulatory setting were just as likely or more likely to receive recommended preventive screenings, these patients were less likely to meet targets for good glycemic and cholesterol control. We also found that both non-Hispanic Black and White patients value continuity of care, good patient-provider communication and being included in treatment decisions and consider these values as important factors in their ability to manage their care. These findings suggest opportunities for care delivery systems to develop patient-centered care strategies to strengthen partnerships between patients and their clinical teams, increase self-management support and use shared-decision making as ways to promote better disease management among minority patients. Consideration of patient-focused measures for assessing the quality of diabetes care may also be useful.

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