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Patient-reported communication quality and perceived discrimination in maternity care

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Abstract

Background—High-quality communication and a positive patient-provider relationship are aspects of patient-centered care, a crucial component of quality. We assessed racial/ethnic disparities in patient-reported communication problems and perceived discrimination in maternity care among women nationally and measured racial/ethnic variation in the correlates of these outcomes.

Methods—Data for this analysis came from the Listening to Mothers III survey, a national sample of women who gave birth to a singleton baby in a U.S. hospital in 2011-2012. Outcomes were reluctance to ask questions and barriers to open discussion in prenatal care, and perceived discrimination during the birth hospitalization, assessed using multinomial and logistic regression. We also estimated models stratified by race/ethnicity.

Results—Over 40% of women reported communication problems in prenatal care, and 24% perceived discrimination during their hospitalization for birth. Having hypertension or diabetes was associated with higher levels of reluctance to ask questions and higher odds of reporting each type of perceived discrimination. Black and Hispanic (vs. white) women had higher odds of perceived discrimination due to race/ethnicity. Higher education was associated with more reported communication problems among Black women only. While having diabetes was associated with perceptions of discrimination among all women, associations were stronger for Black women.

Conclusions—Race/ethnicity was associated with perceived racial discrimination, but diabetes and hypertension were consistent predictors of communication problems and perceptions of discrimination. Efforts to improve communication and reduce perceived discrimination are an important area of focus for improving patient-centered care in maternity services.

Keywords

patient-centered care; disparities; maternity care

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Introduction

Patient-centered care, defined as "care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions,"[1(p6)] is a crucial component of quality health care.[1] Aspects of patient-centered care such as patient-provider communication and patient involvement in decision-making are associated with higher levels of patient satisfaction, more trust in the provider, and better treatment adherence;[2–6] in some studies patient-centered care is also associated with better health outcomes.[7,8] Research using objective measures (e.g. observation or transcribed recordings) of communication during clinical encounters has found that racial/ethnic minority patients experience poorer-quality communication than White patients.[9–11] Studies using patients' own assessments of their communication with providers have had mixed results, with some finding poorer communication among non-White patients, while others found equivalent or more positive communication reports from racial/ethnic minority patients.[12–18] Discrimination in the healthcare context is a barrier to patient-centered care, and perceived discrimination is associated with many negative consequences, including worse communication in the clinical encounter, lower patient ratings of care, less adherence to treatment recommendations, and poorer overall health.[19–22] Patients from racial/ethnic minority groups are more likely to report experiencing discrimination in the healthcare system than White patients.[19,21] Understanding differences in care experiences may be an important step in addressing racial/ethnic disparities in health.

Few published studies on efforts to improve patient-centered care have focused on maternity care, despite the fact that nearly 4 million women give birth in U.S. hospitals each year, following an average of 10-15 prenatal care visits.[23,24] Nearly half women who give birth in the US are from racial/ethnic minority groups,[23] and there are striking racial/ethnic disparities in maternal and neonatal outcomes.[25,26] High-quality communication and fostering a positive patient-provider relationship may be particularly important in maternity care, as women encounter new health information while pregnant, make myriad choices about care throughout the pregnancy, labor and birth, and have close contact with the healthcare system during this period. The provision of patient-centered care, with a focus on communication and shared decision-making, is identified as a goal in a 2011 statement endorsed by several leading maternity care-related professional organizations.[27] Research on patient-provider communication and perceived discrimination in the maternity care context has been limited,[5,28–31] and has not examined the correlates of these aspects of care in a national context and whether they differ by patient race/ethnicity.

Medical conditions in pregnancy, including diabetes, hypertension, and obesity, have been on the rise in recent decades,[32–34] and are linked to worse outcomes during pregnancy and birth.[32,35] Careful management of these conditions during pregnancy (e.g. controlling blood sugar among diabetics) can mitigate negative health effects, and communication may be instrumental in achieving patient education and engagement that will lead to successful management. Black and Hispanic/Latina women have higher rates of these medical conditions compared to White women,[36,37] potentially rendering the quality of the patient-provider relationship particularly important for these groups.

The goals of this analysis were 1) to examine whether there are racial/ethnic disparities in patient-provider communication quality during prenatal care and perceived discrimination during birth hospitalizations in a national sample, and 2) to explore potential racial/ethnic variation in the socio-demographic and health-related correlates of these outcomes.

Methods

Data

Data are from the Listening to Mothers III (LTM 3) survey, a cross-sectional, nationally-drawn, web-based survey of women age 18-45 who gave birth in US hospitals in 2011 and 2012 (*N*=2,400). Fielded in the fall of 2013, the survey was commissioned by Childbirth Connection and conducted by Harris Interactive. Women were sampled from online panels, and responses were assigned weights such that sample characteristics approximate those of the population of U.S. women who gave birth in 2010 (the most recent year for which data were available at the time). The LTM 3 survey uniquely addresses factors not captured in other national data sources, such as perception of communication with providers and perceptions of discrimination, and also collected detailed information about women's experiences before, during, and after their recent birth.

Measures

Outcomes—The primary dependent variables were based on 7 questions regarding women's perceptions of communication with their providers *during prenatal care* and 3 questions regarding women's perceptions of receiving poor treatment *during the birth hospitalization*. The questions related to prenatal care communication quality included whether the woman had held back questions during her prenatal care appointments for any of 3 reasons, and whether she felt that her provider had spent enough time with her. For the items pertaining to holding back questions during prenatal care, response choices were "no, never," "yes, once," or "yes, more than once." For the remaining items, response choices were "never," "sometimes," "usually," or "always." Each item and its possible responses are shown in Table 1. Information on the instruments that were adapted is available elsewhere.[38] We used exploratory factor analysis with varimax rotation to examine whether items represented one or multiple domains of communication and patient-provider interaction and assessed internal consistency of the resulting scale using Cronbach's alpha.

This analysis identified the three domains indicated in Table 1: "reluctance to ask questions" ($\alpha = 0.73$), "barriers to open discussion" ($\alpha = 0.85$) and "perceived discrimination" ($\alpha = 0.89$). The item "provider used medical words you didn't understand" did not load onto any of the factors; therefore, we did not include this item in the analysis. We created a scale for each factor by summing scores from the relevant items. Scoring was reversed for positive items so that in the resulting scales higher scores indicate more communication problems/ perceived discrimination, with ranges of 0-6 for "reluctance to ask questions" and 0-9 for the other two scales.

Each of the scales had a skewed distribution. Consistent with previous research, we categorized scale scores into tertiles (low, moderate and high), choosing cutpoints so that

15-20% of responses fell into the "high" category.[39] As less than 25% of respondents reported any discrimination, we dichotomized the perceived discrimination scale. We also modeled responses to each dichotomized perceived discrimination item separately.

Race/ethnicity—We stratified the sample based on women's self-reported race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and other). We excluded women who identified as other racial/ethnic groups due to small sample size (weighted n=169) and difficulty of interpretation because of the heterogeneity of this group.

Socio-demographic factors—Socioeconomic status variables were education (high school or less, some college, Bachelor's degree or higher), and insurance type (private, public, uninsured). Demographic covariates included age, marital status (married or not), and parity (first-time vs. experienced mother).

Medical conditions—Women who reported taking medication for high blood pressure prior to pregnancy were coded as having chronic hypertension. We classified women as having diabetes if they reported having pre-existing or gestational diabetes. From self-reported measures of height and pre-pregnancy weight, we calculated pre-pregnancy body mass index (BMI), and coded women as being obese prior to pregnancy if their pre-pregnancy BMI was 30 or above.

Context of care—We also included variables related to the context of care: prenatal provider type (OB/GYN or other), whether the woman always or almost always saw the same person for prenatal care, and average appointment length (0-15 minutes, 16-30 minutes, and more than 30 minutes). Because the perceived discrimination questions pertained to the entire hospital stay, we also included delivery characteristics in those models. These were: 1) use of pharmacologic pain relief (no pain medication, narcotics/ other but no epidural, or epidural), 2) labor induction, and 3) cesarean delivery. We also included categorized versions of the reluctance to ask questions and barriers to open discussion scales in the perceived discrimination models, since these scales pertained to prenatal care and preceded the outcomes.

Analysis

First we compiled descriptive statistics for the sample and outcomes by race/ethnicity, testing differences using Pearson's chi-square tests for categorical variables. We used multinomial logistic regression to assess predictors of "moderate" and "high" levels of problems with communication in prenatal care, using "low" levels of each score as the reference category. For the perceived discrimination outcomes, we used logistic regression models to compare scores of 0 with scores of 1+ for the overall perceived discrimination scale and for each type of perceived discrimination separately. Finally, we added interaction terms to our base models to test whether the association between medical conditions, education, insurance status, and the outcomes differed by race/ethnicity. To make these findings more interpretable, we re-estimated models separately for each racial/ethnic group.

We conducted sensitivity analyses using ordered logistic regression, linear regression, and logistic regression for the communication in prenatal care scales using dichotomized

outcomes. We present multinomial logistic regressions to reflect the structure of the data. Results were similar regardless of which categorization and model was used.

All analyses were weighted to be nationally representative.

Results

Characteristics of the sample and outcomes by race/ethnicity are shown in Table 2. About 35% of White women had a Bachelor's degree or higher, compared to 22% of Black women and 19% of Hispanic women. Nearly 60% of White women had private insurance, while over 60% of Black and Hispanic women had public insurance. Black and Hispanic women had higher levels of pre-pregnancy hypertension and diabetes than white women.

Forty percent of women reported some reluctance to ask questions, and 65% reported some barriers to open discussion. Communication in prenatal care did not differ significantly by race/ethnicity. Less than 10% of white women reported poor treatment due to race, language or culture, compared to 19-21% of racial/ethnic minority women. Similarly, 13% of white women reported insurance-based discrimination, compared to about 20% in the other groups. Perceptions of poor treatment due to difference of opinion did not vary significantly by race/ethnicity.

Results from multinomial logistic regressions for communication problems in prenatal care are presented in Table 3. There was no difference in women's reports of either dimension of communication quality by race/ethnicity, after controlling for other characteristics. Women with some college were more likely to report moderate reluctance (vs. low) to ask questions, compared to women with a high school education or less. Older women were less likely to report moderate or high (vs. low) reluctance to ask questions. Women who were uninsured were had 4 times the odds of reporting high (vs. low) reluctance to ask questions. Women with pre-pregnancy hypertension had about twice the odds of moderate or high levels of reluctance to ask questions, compared to women without this condition. Diabetes was associated with about 70% higher risk of moderate (vs. low) reluctance to ask questions, and four and a half times the risk of high (vs. low) reluctance to ask questions, compared to women without diabetes. Women with a Bachelor's degree or higher were more likely to report moderate (vs. low) barriers to open discussion, compared to women with a high school education or less. Older maternal age was associated with lower barriers to discussion. Diabetes was associated with nearly twice the odds of experiencing high (vs. low) barriers to open discussion.

Black and Hispanic race/ethnicity were associated with higher odds of discrimination due to race, language or culture, but not with the other discrimination outcomes (Table 5). Uninsured women had nearly twice the odds of experiencing any perceived discrimination, and this was driven by reports of race- and insurance-based discrimination. Maternal health conditions were strongly associated with perceived discrimination; both pre-pregnancy hypertension and diabetes were associated with higher odds of each type of perceived discrimination. Women giving birth for the first time were more likely to report poor treatment due to race, language or culture, insurance type, and due to a difference of opinion

about care. Reluctance to ask questions in prenatal care was strongly associated with perceptions of discrimination for each reason examined. High scores on the barriers to open discussion scale were also associated with higher chances of perceived discrimination.

We found significant interactions between education and race/ethnicity for the communication outcomes. Stratified models, presented in Table 5, show that the association between higher education and more communication problems in prenatal care was present among Black women only. There were also significant interactions between race/ethnicity and medical conditions for the discrimination outcomes. The relationship between hypertension and perceptions of discrimination was driven by the White women in the sample. While diabetes was a predictor of discrimination across all racial/ethnic groups, this relationship was even stronger among Black women. There was no relationship between obesity and discrimination for White women, but obesity was associated with reduced odds of some of the discrimination outcomes among Black and Hispanic women. Finally, although estimates are imprecise due to small sample size, the relationship between uninsurance and discrimination appears to be driven by Hispanic women.

Discussion

Problems with patient-provider communication during prenatal care may hinder the exchange of information and negatively affect the patient's trust in the provider. Our results indicate that many women have difficulty communicating with their health care providers during the prenatal period, with 40-66% reporting communication problems. While less common, about 24% of women also report experiencing discrimination during their hospital stay for childbirth. Good communication and lack of discrimination are both ends in themselves and markers of care quality, but are also important for intermediate outcomes such as engagement with the health system and for overall health. After adjusting for other characteristics, Black and Hispanic women were more likely than white women to report perceived discrimination due to race, language or culture, but no more likely to report communication problems in prenatal care or perceived discrimination due to other factors. Women who reported communication problems during prenatal care were substantially more likely to perceive discrimination during their childbirth hospitalization, which is consistent with prior research in other populations.[21,40]

We found associations between both hypertension and diabetes and increased reports of communication problems in prenatal care and perceived discrimination during the birth hospitalization. The stratified analysis revealed that the hypertension results were driven by this association among White women. Diabetes, however, was strongly associated with these outcomes across racial/ethnic groups, and had a particularly strong association with perceptions of discrimination among Black women. Previous studies have also found associations between health status of patients and their perceptions of patient-centered practice style from providers and perceived discrimination.[41] Women with medical conditions during pregnancy may have more questions about managing these conditions and about their care, which could intensify time pressures during prenatal care appointments. Pregnant women with diabetes participating in focus groups reported problems accessing needed information from providers and in written form.[42] In addition, providing clinical care

for women with diabetes or hypertension during pregnancy may be more complex for clinicians and may also require greater effort on the part of women with these conditions, who may need to follow modified diet or exercise plans during pregnancy. The measured association may capture the challenges posed in patient-provider communication about both clinical and behavioral efforts needed to manage medically complex pregnancies.

The similarity in overall communication experiences across racial/ethnic groups and the relationship between higher education and increased chances of reporting communication problems in prenatal care among Black women raise the potential issue of differences in response tendencies by group. Previous research using patient-reported measures of care quality has found lower ratings of care experiences among more educated patients, as well as similar or better reports of patient-provider communication among some racial/ethnic minority groups.[13,15,43] Expectations of care may vary by social group, resulting in some groups evaluating the same experiences more positively than others ("positive response tendency").[44,45] For example, more educated women might expect a higher degree of responsiveness from their clinicians regarding their concerns and therefore perceive the same behavior from a clinician more negatively than a woman with less education and lower expectations. A second explanation is that groups may use survey response choices differently; specifically, some groups may be more likely to use the most positive or most negative responses to a scale rather than the middle values ("extreme response tendency").[44] The items used in our study asked about specific aspects of communication, and these types of measures are less vulnerable to response tendency differences than global assessments of care quality. Categorizing the resulting scales may have further alleviated this potential problem.[39] However, given that these scales have not been validated for use across groups, we cannot rule out positive response tendency as an explanation for our findings.

Previous studies of insurance-based discrimination have found it to be most prevalent among uninsured individuals, followed by those with public insurance.[28] We found that women who were uninsured were more likely than privately insured women to not only report insurance-based discrimination, but also to report also poor treatment to race, language or culture and poor communication during prenatal care. The stratified analyses suggested that this association was concentrated among Hispanic women, who also had a higher prevalence of reported uninsurance in our sample. Public insurance coverage was also associated with perceptions of discrimination due to insurance status, but not with communication problems or other types of discrimination.

Policy implications

Our results suggest a need to improve care experiences during maternity care, particularly for women who have medical complications during pregnancy and those who are uninsured. To ameliorate women's prenatal care experiences, education and support services offered as an adjunct to clinical care, or group prenatal care models such as Centering Pregnancy,[46] may provide a forum for women to receive needed information with less time pressure. State Medicaid programs play an influential role in maternity care, as the payer for nearly half of all U.S. births.[47] Policy efforts to increase access to Medicaid coverage for the uninsured and to support increased access to evidence-based support services and clinical care models

through health insurance benefits design and Medicaid coverage may support improvements in patient-provider communication.

While discrimination based on race, ethnicity or language was the least prevalent type of discrimination in this sample, it is still important to address as the consequences of discrimination can affect future interactions with the healthcare system and, ultimately, health status.[19–21] Cultural competency training or training aimed at helping providers to recognize and compensate for their implicit biases may help to reduce patients' perceptions of discrimination in maternity care.[48,49] Requirements for such trainings could be incorporated into institutional policies in hospitals and clinics as well as provider enrollment or employment requirements of health plans and delivery systems.

Finally, further research exploring the kinds of behaviors from providers and hospital staff that women perceive to be discriminatory would be helpful in guiding efforts to increase the equity of maternity care.

Limitations

These findings must be considered in light of some limitations. Communication in prenatal care was reported after the birth occurred, and thus women's recall could have been influenced by the birth experience. Women responded to the survey between 3 and 19 months after giving birth; it is possible that the memory of prenatal care and experiences could change over time, but the outcomes we examined did not vary based on time since birth. While respondents were diverse and drawn from all 50 states and responses were weighted to approximate the characteristics of the national childbearing population, this was not a probability sample and therefore may not be nationally representative. Medical conditions and labor and delivery characteristics were self-reported, and could not be verified with other sources such as medical records. There was substantial overlap between reports of pre-existing and gestational diabetes, and we were unable to distinguish between these conditions. We were not able to measure whether women experienced discrimination during prenatal care, or what kind of treatment in the hospital was perceived as discriminatory and from whom. Finally, we were unable to account for the fact that people may report discrimination differently; ideally we would have included a scale measuring respondents' tendency to respond according to social desirability, but these data did not contain measure of this tendency.[50]

Conclusions

The quality of the patient-provider relationship is now a widely recognized component of patient-centered care, but it has been understudied in the context of maternity care. While racial/ethnic minority women were no more likely than white women to report communication problems in prenatal care, Black and Hispanic women were more likely to report race-based discrimination during their birth hospitalization. The overall prevalence of patient-reported communication quality and perceived discrimination indicates problems in these domains around the time of childbirth. Women with medical conditions during pregnancy are particularly likely to experience poor communication and perceive discrimination, and are at risk for a number of complications during childbirth; having a

positive relationship with their provider may help mitigate these risks. Overall, problems with patient-provider communication likely affect nearly 2 million American women each year at the time of childbirth. Efforts to improve communication and reduce perceived discrimination are an important area of focus for improving patient-centered care in the maternity care context.

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Table 1

Items and response choices for communication and perceived discrimination.

Question	Response choices	Domain[b]
During a prenatal visit in your recent pregnancy, did you ever hold back from asking questions or discussing your concerns because…		
Your maternity care provider seemed rushed	No, never; Yes, once; Yes, more than once	Reluctance to ask questions
You wanted maternity care that differed from what your maternity care provider recommended	No, never; Yes, once; Yes, more than once	Reluctance to ask questions
You thought that your maternity care provider might think you were being difficult	No, never; Yes, once; Yes, more than once	Reluctance to ask questions
During your pregnancy, how often did you maternity care provider…		
Use medical words you did not understand	Never; Sometimes; Usually; Always	None
[a]Spend enough time with you	Never; Sometimes; Usually; Always	Barriers to open discussion
[a]Answer all your questions to your satisfaction	Never; Sometimes; Usually; Always	Barriers to open discussion
[a]Encourage you to talk about all your health questions or concerns	Never; Sometimes; Usually; Always	Barriers to open discussion
During your hospital stay when you had your baby, how often were you treated poorly because of…		
Your race, ethnicity, cultural background or language	Never; Sometimes; Usually; Always	Perceived discrimination
Your health insurance situation	Never; Sometimes; Usually; Always	Perceived discrimination
A difference of opinion with your caregivers about the right care for yourself or your baby	Never; Sometimes; Usually; Always	Perceived discrimination

[a]Coding was reversed for this item.

[b]Domains were empirically identified using factor analysis.

Table 2

Sample characteristics and outcomes by race/ethnicity.

	Total (n=2,231)	White non-Hispanic (n=1,308)	Black non-Hispanic (n=368)	Hispanic (n=555)	*P*
Education					<0.001
High school or less	42.7	37.7	39.9	56.1	
Some college/Associate's degree	28.5	27.5	37.7	25.0	
Bachelor's degree or higher	28.8	34.8	22.4	18.8	
Primary source of payment for maternity care					<0.001
Private	48.4	59.7	33.7	31.6	
Public	47.2	37.2	61.5	61.2	
Uninsured	4.4	3.1	4.8	7.2	
Pre-pregnancy hypertension	7.8	5.9	12.2	9.3	0.012
Diabetes	19.2	16.7	21.4	23.6	0.050
Obese pre-pregnancy	20.3	18.8	26.0	20.3	0.118
Age (mean (SD))	28.1 (5.9)	29.1 (6.1)	26.7 (5.5)†	26.8 (5.3)†	
Married	60.6	70.3	31.6	57.1	<0.001
First time mother	40.1	38.0	45.0	41.8	0.206
OB/GYN prenatal care provider	78.4	79.3	77.5	77.2	0.737
Almost always saw same person for prenatal care	77.8	73.9	81.0	84.7	0.001
Average length of prenatal care appointment					<0.001
0-15 minutes	22.4	26.5	11.9	19.5	
16-30 minutes	45.4	46.4	45.1	43.3	
More than 30 minutes	32.3	27.1	43.0	37.2	
Pain medication type					0.240
None	16.9	15.3	21.3	17.9	
Narcotics or other, no epidural	15.0	14.2	13.8	17.5	
Epidural	68.1	70.5	64.9	64.6	
Labor induction	40.8	42.1	35.6	41.3	0.317
Cesarean delivery	31.6	32.7	25.1	33.3	0.147
Communication in prenatal care					
Reluctance to ask questions					
Low	59.9	60.9	60.9	56.6	0.211
Moderate	23.7	24.1	18.6	26.3	
High	16.4	15.0	20.4	17.1	
Barriers to open discussion					0.082
Low	34.8	35.0	42.1	29.4	
Moderate	48.4	49.0	42.7	50.5	
High	16.9	15.9	15.2	20.1	
Treated poorly in hospital due to…					
Any reason	23.7	21.1	29.1	26.0	0.059
Race, cultural group, language	13.0	8.4	20.9	18.5	<0.001

	Total (n=2,231)	White non-Hispanic (n=1,308)	Black non-Hispanic (n=368)	Hispanic (n=555)	*P*
Insurance situation	15.8	13.0	19.2	20.2	0.012
Difference of opinion with provider	19.2	17.6	22.4	21.1	0.248

Note: Ns and percentages are weighted. For "Reluctance to ask questions," scores of 0 are "Low," scores of 1-2 are "Moderate," and scores of 3-6 are "High." For "Barriers to open discussion," scores of 0 are "Low," scores of 1-4 are "Moderate," and scores of 5-9 are "High."

† Significantly different from White non-Hispanic ($p<.05$)

Table 3

Multinomial logistic regression results for two dimensions of communication during prenatal care.[‡]

	Reluctance to ask questions scale				Barriers to open discussion scale			
	Moderate		High		Moderate		High	
	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
Race and SES								
Race/ethnicity (Ref=White, non-Hispanic)								
Black, non-Hispanic	0.64	(0.40, 1.01)	1.17	(0.69, 1.96)	0.73	(0.48, 1.09)	0.70	(0.40, 1.22)
Hispanic	1.09	(0.76, 1.56)	0.98	(0.61, 1.58)	1.32	(0.93, 1.88)	1.33	(0.83, 2.13)
Education (Ref=High school or less)								
Some college/Associate's degree	**1.47**	**(1.03, 2.08)**	1.32	(0.86, 2.02)	1.33	(0.95, 1.85)	0.89	(0.58, 1.37)
Bachelor's degree or higher	1.38	(0.93, 2.03)	1.49	(0.92, 2.41)	**1.77**	**(1.22, 2.56)**	0.82	(0.49, 1.38)
Primary source of payment for maternity care (Ref=Private)								
Public	0.92	(0.66, 1.27)	0.88	(0.57, 1.34)	0.92	(0.67, 1.26)	0.94	(0.61, 1.46)
Uninsured	1.58	(0.73, 3.41)	**4.30**	**(2.01, 9.19)**	0.97	(0.49, 1.92)	1.51	(0.66, 3.44)
Maternal health conditions								
Pre-pregnancy hypertension	**1.83**	**(1.08, 3.11)**	**2.05**	**(1.14, 3.65)**	1.20	(0.68, 2.11)	1.35	(0.68, 2.68)
Diabetes	**1.69**	**(1.13, 2.54)**	**4.52**	**(3.01, 6.79)**	0.99	(0.68, 1.43)	**1.92**	**(1.24, 2.96)**
Obese pre-pregnancy	0.99	(0.69, 1.43)	1.05	(0.68, 1.64)	0.92	(0.66, 1.29)	1.07	(0.70, 1.63)
Demographic characteristics								
Age	**0.95**	**(0.93, 0.98)**	**0.92**	**(0.89, 0.96)**	**0.95**	**(0.93, 0.98)**	**0.93**	**(0.90, 0.97)**
Married	0.84	(0.60, 1.18)	1.07	(0.71, 1.62)	0.88	(0.64, 1.20)	0.91	(0.59, 1.40)
First time mother	1.15	(0.86, 1.55)	0.95	(0.66, 1.37)	0.82	(0.62, 1.08)	0.72	(0.49, 1.06)

[‡]Models control for prenatal provider type (OB or other), continuity of care in prenatal care, and average prenatal care appointment length. Boldface type indicates $p<.05$.

Table 4

Logistic regression results for perceived discrimination.[‡]

	Poor treatment due to…							
	Any reason		Race, language, culture		Insurance status		Difference of opinion about care	
	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
Race and SES								
Race/ethnicity (Ref=White, non-Hispanic)								
Black, non-Hispanic	1.32	(0.81, 2.14)	**2.99**	**(1.56, 5.74)**	1.36	(0.75, 2.47)	1.08	(0.65, 1.79)
Hispanic	0.97	(0.66, 1.42)	**2.25**	**(1.32, 3.81)**	1.24	(0.77, 1.97)	0.93	(0.61, 1.40)
Education (Ref=High school or less)								
Some college/Associate's degree	1.11	(0.76, 1.63)	0.63	(0.38, 1.06)	0.71	(0.45, 1.13)	1.42	(0.94, 2.14)
Bachelor's degree or higher	1.21	(0.78, 1.90)	1.17	(0.66, 2.06)	0.79	(0.46, 1.36)	1.18	(0.73, 1.90)
Primary source of payment for maternity care (Ref=Private)								
Public	1.31	(0.92, 1.88)	1.21	(0.74, 1.96)	**1.66**	**(1.05, 2.62)**	1.22	(0.83, 1.79)
Uninsured	**2.18**	**(1.13, 4.22)**	**2.88**	**(1.34, 6.20)**	**3.33**	**(1.56, 7.08)**	1.45	(0.74, 2.85)
Maternal health conditions								
Pre-pregnancy hypertension	**1.70**	**(1.05, 2.75)**	**2.41**	**(1.38, 4.22)**	**2.11**	**(1.15, 3.84)**	**1.72**	**(1.01, 2.95)**
Diabetes	**2.38**	**(1.66, 3.42)**	**3.25**	**(2.09, 5.04)**	**3.02**	**(1.99, 4.57)**	**2.47**	**(1.70, 3.58)**
Obese pre-pregnancy	0.73	(0.48, 1.12)	0.63	(0.35, 1.13)	0.60	(0.35, 1.03)	0.76	(0.48, 1.20)
Demographic characteristics								
Age	0.99	(0.96, 1.02)	1.02	(0.97, 1.07)	1.01	(0.96, 1.06)	1.00	(0.97, 1.04)
Married	0.80	(0.55, 1.16)	0.78	(0.48, 1.28)	1.10	(0.68, 1.78)	0.80	(0.54, 1.18)
First time mother	1.18	(0.84, 1.67)	**1.85**	**(1.16, 2.96)**	1.48	(0.96, 2.30)	**1.60**	**(1.11, 2.31)**
Communication in prenatal care								
Reluctance to ask questions (Ref=low)								
Moderate	**3.37**	**(2.28, 5.00)**	**4.13**	**(2.30, 7.43)**	**4.17**	**(2.37, 7.33)**	**2.95**	**(1.93, 4.52)**
High	**6.42**	**(4.16, 9.90)**	**9.48**	**(5.15, 17.46)**	**7.82**	**(4.36, 14.03)**	**7.15**	**(4.52, 11.3)**
Barriers to open discussion (Ref=low)								
Moderate	1.38	(0.91, 2.10)	1.19	(0.66, 2.16)	1.21	(0.70, 2.09)	**1.73**	**(1.11, 2.69)**
High	**2.11**	**(1.29, 3.44)**	1.73	(0.82, 3.65)	**2.10**	**(1.11, 3.97)**	**2.22**	**(1.33, 3.72)**

Boldface type indicates p<.05.

[‡]Models control for prenatal provider type (OB or other), continuity of care in prenatal care, use of pain medications, labor induction, and cesarean delivery.

Table 5

Adjusted odds of perceptions of communication problems during prenatal care and discrimination during the birth hospitalization, stratified by race/ethnicity.

	Reluctance to ask questions‡		Barriers to open discussion‡		Poor Treatment due to…§			
	Moderate	High	Moderate	High	Any reason	Race, language, culture	Insurance status	Difference of opinion about care
	AOR	AOR	AOR	AOR	AOR	AOR	AOR	AOR
White								
Education (Ref=High school or less)								
Some college	1.29	1.20	1.48	1.22	1.26	0.73	0.64	1.69
Bachelor's degree or higher	1.10	0.99	1.58	0.82	0.92	1.02	0.55	1.06
Primary source of payment for maternity care (Ref=Private)								
Public	0.84	0.99	0.83	1.01	1.25	1.74	**1.84**	1.04
Uninsured	1.23	**3.48**	1.02	1.83	1.20	2.36	1.88	0.80
High blood pressure	**2.13**	**2.64**	0.90	1.25	1.77	**4.19**	**3.12**	1.34
Diabetes	**1.73**	**4.97**	0.85	**1.96**	**2.06**	**3.01**	**2.52**	**2.00**
Obese pre-pregnancy	1.32	1.09	0.76	0.69	1.26	0.79	0.77	1.49
Black								
Education (Ref=High school or less)								
Some college	2.34	2.43	1.84	1.12	0.84	0.59	1.34	0.97
Bachelor's degree or higher	**7.06**†	**5.16**†	**4.81**	3.21†	1.65	1.89	1.30	1.45
Primary source of payment for maternity care (Ref=Private)								
Public	1.33	1.48	0.99	0.96	2.11	1.36	1.53	1.47
Uninsured	0.48	**7.40**	0.81	2.64	2.15	1.18	5.02	0.40
High blood pressure	0.91	1.94	1.10	1.83	1.00	0.76†	0.44†	3.02
Diabetes	3.16	**6.10**	1.83	2.91	**4.85**	**8.02**†	**10.34**†	**6.04**†
Obese pre-pregnancy	0.71	1.00	1.46	2.06	**0.39**†	0.49	1.17	0.28†
Hispanic								
Education (Ref=High school or less)								
Some college	1.55	0.92	0.85	**0.40**†	0.78	0.71	0.73	0.89
Bachelor's degree or higher	1.17	2.14†	1.37	0.44	1.61	1.35	1.24†	1.02
Primary source of payment for maternity care (Ref=Private)								
Public	0.94	**0.39**†	0.94	0.60	1.15	0.78	1.32	1.43
Uninsured	2.60	2.72	0.95	0.77	**5.27**†	**5.54**	**10.72**	3.13
High blood pressure	2.51	1.58	1.60	1.06	2.24	2.19	2.49	2.13
Diabetes	1.06	**3.30**	0.97	1.57	**2.65**	**2.61**	**3.23**	**3.10**

	Reluctance to ask questions‡		Barriers to open discussion‡		Poor Treatment due to…§			
	Moderate	High	Moderate	High	Any reason	Race, language, culture	Insurance status	Difference of opinion about care
	AOR	AOR	AOR	AOR	AOR	AOR	AOR	AOR
Obese pre-pregnancy	0.57	1.10	1.11	1.61	**0.23**†	0.51	**0.14**†	**0.14**†

Bold indicates a statistically significant (p<.05) coefficient in the stratified model.

‡Models control for prenatal provider type (OB or other), continuity of care in prenatal care, and average prenatal care appointment length

§Models control for prenatal provider type (OB or other), continuity of care in prenatal care, use of pain medications, labor induction, cesarean delivery, and communication during prenatal care

†Interaction term in full model was significant at p<.05