Self-Reported Experiences of Racial Discrimination and Black–White Differences in Preterm and Low-Birthweight Deliveries: The CARDIA Study

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Objectives. We examined the effects of self-reported experiences of racial discrimination on Black–White differences in preterm (less than 37 weeks gestation) and low-birthweight (less than 2500 g) deliveries.

Methods. Using logistic regression models, we analyzed data on 352 births among women enrolled in the Coronary Artery Risk Development in Young Adults Study.

Results. Among Black women, 50% of those with preterm deliveries and 61% of those with low-birthweight infants reported having experienced racial discrimination in at least 3 situations; among White women, the corresponding percentages were 5% and 0%. The unadjusted odds ratio for preterm delivery among Black versus White women was 2.54 (95% confidence interval [CI]=1.33, 4.85), but this value decreased to 1.88 (95% CI=0.85, 4.12) after adjustment for experiences of racial discrimination and to 1.11 (95% CI=0.51, 2.41) after additional adjustment for alcohol and tobacco use, depression, education, and income. The corresponding odds ratios for low birthweight were 4.24 (95% CI=1.31, 13.67), 2.11 (95% CI=0.75, 5.93), and 2.43 (95% CI=0.79, 7.42).

Conclusions. Self-reported experiences of racial discrimination were associated with preterm and low-birthweight deliveries, and such experiences may contribute to Black–White disparities in perinatal outcomes. (*Am J Public Health.* 2004;94:2125–2131)

Despite decades of public health and medical initiatives designed to improve birth outcomes, risks of preterm (less than 37 weeks gestation) and low-birthweight (LBW; less than 2500 g) deliveries remain substantially higher for Black than for White women in the United States.[1] In 2001, national preterm delivery rates among Black and White women were 17.5 and 10.8 per 100 live births, respectively; in the case of LBW, the corresponding rates were 13.1 and 6.8.[2] Extant research indicates that this Black–White gap is only partially explained by major identified determinants of these adverse birth outcomes such as tobacco, alcohol, and drug use; use of prenatal care; genetics; and socioeconomic position.[3–6]

Specifically, studies have shown that although economic deprivation contributes to the higher risk of LBW among Black than White infants, it does not fully account for this risk, given that Black–White disparities remain even within socioeconomic strata.[4] Casting doubt that alleged genetic differences could explain the disparity, moreover, is research demonstrating that recent immigrants, both Black and White, tend to give birth to higher birthweight babies than women of the same ancestry born and raised in the United States, regardless of socioeconomic position.[7]

The persistence of the Black–White gap, even after taking into account socioeconomic position and other known risk factors, has led to formulation of a new hypothesis: that racial discrimination, as a psychosocial stressor, may increase the risk of preterm and LBW deliveries.[6,8–10] Supporting inquiry on the impact of racial discrimination on birth outcomes are the results of 2 recent studies. One of these studies showed that self-reported experiences of racial discrimination were associated with extremely LBW deliveries in a sample of low-income Black women,[11] and the other produced evidence of an increased risk of preterm deliveries among women who reported high levels of racial discrimination.[12] Lending additional credence to this hypothesis are 2 other areas of research, one linking maternal experiences of other types of social trauma, such as violence, to risk of poor birth outcomes[10,13–17] and the other documenting associations between self-reported experiences of racial discrimination and other somatic health outcomes, particularly hypertension.[18–21]

Accordingly, in this study we addressed the following questions: Do self-reported lifetime experiences of racial discrimination contribute to Black–White differences in preterm and LBW deliveries? and if so, are such associations independent of or mediated by other physical, psychosocial, or behavioral factors hypothesized to affect the risk of these outcomes? To explore these questions, we used data from the Coronary Artery Risk Development in Young Adults (CARDIA) Study, a longitudinal, multisite, epidemiological cohort investigation designed to examine the development of cardiovascular risk factors in a large sample of young Black and White women and men.

METHODS

Sample

CARDIA's setting, sample, and data collection methods have been described elsewhere and are summarized here.[22] Briefly, CARDIA began in 1985 as a prospective cohort study designed to investigate factors that influence the development of coronary artery disease during young adulthood. Participants were recruited from 4 geographically diverse metropolitan areas: Birmingham, Ala; Chicago, Ill; Oakland, Calif; and Minneapolis, Minn. A stratified random sampling procedure was employed with the goal of achieving a sample that included equal numbers of Blacks and Whites, women and men, individuals aged 18 to 25 and 25 to 30 years, and individuals with less than a high school education and more than a high school education.

A total of 5115 individuals participated in the initial examination, including 1480

Black women and 1307 White women. Of the surviving baseline cohort, 91% returned at year 2 (1987–1988), 86% returned at year 5 (1990–1991), 81% returned at year 7 (1992–1993), and 79% returned at year 10 (1995–1996). Given that questions pertaining to racial discrimination were first asked in the year 7 examination, this study included only the 367 births to women who attended examinations during years 7 and 10 and gave birth after year 7 (i.e., between 1992 and 1995).

From these 367 deliveries, we excluded deliveries that resulted in multiple infants (n=12) or stillbirths (n=1) and those in which the gestational age was less than 20 weeks (n=2); as a result of these exclusions, our total sample size was 352. Twenty-nine women had given birth to a live infant more than once during the interval between year 7 and year 10, and all such births were included. Self-reported data on birth outcomes were collected at year 10. Predictors of LBW and potential modifiers were measured at year 7 unless otherwise noted.

Birth Outcomes

Participants reported their baby's birthweight in pounds and ounces; these data were converted to grams. LBW was defined as less than 2500 g. Participants reported their baby's gestational age at birth in weeks. Preterm deliveries were defined as those involving a gestational age below 37 weeks. Given the possibility of recall error or bias in reporting of birthweight and gestational age, we included a covariate for elapsed time between the birth and the year 10 (1995) interview.

Self-Reported Experiences of Racial Discrimination

During the year 7 (1992) examination, participants completed a discrimination questionnaire[18,19] asking them whether they had "ever experienced discrimination, been prevented from doing something or been hassled or made to feel inferior . . . because of their race or color" in any of 7 situations: "at school, getting a job, at work, getting housing, getting medical care, on the street or in a public setting, and from the police or in the courts." Responses were combined to form a 3-level categorical variable pertaining to reports of racial discrimination in 0, 1 or 2, or 3 or more of the specified situations.[18,19]

Potential Modifiers and Covariates

Response to unfair treatment. On the discrimination questionnaire, participants were asked "If you feel you have been treated unfairly, do you usually: accept it as a fact of life or try to do something about it?"

Depression. The 20-item Center for Epidemiological Studies Depression Scale[23] was administered during the year 5 (1990) examination. Scores on this scale can range from 0 to 60, with higher scores indicating more depression symptoms. Although this variable was measured 2 years before the year 7 examination, it represented the most recently available measurement and, therefore, the best approximation of depressive symptoms we could obtain.

Substance use. Although measures focusing on tobacco, alcohol, and drug use during pregnancy were not available, participants had been assessed during the year 7 (1992) examination in regard to previous use. Smoking status was categorized as never, former, or current. Alcohol use was classified as use in the past year or no use in the past year. History of drug use was included in preliminary analyses but dropped owing to its lack of association with the birth outcomes under investigation.

Maternal anthropometric and health factors. Participants reported occurrences of toxemia and gestational hypertension for each of their pregnancies. Self-reported gestational weight gain was recorded in pounds and converted to kilograms. To adjust for birthweight, we subtracted infant birthweight from gestational weight gain and included the net result in our models (net gestational weight gain). Data on prepregnancy body mass index (BMI; from the year 7 examination) were limited because, in the CARDIA protocol, pregnant women are not weighed; as a result, 16% of the participants were missing these data. Analyses of the subset of participants for which these data were available indicated that prepregnancy BMI was not significantly associated with the birth outcomes assessed here; therefore, we did not include this variable in our analyses.

Sociodemographic characteristics. Marital status, age, self-reported race/ethnicity, and 2 measures of socioeconomic position (income and education) were included as covariates. All participants classified themselves as White, non-Hispanic or Black, non-Hispanic. Categorical data indicated that annual family incomes ranged from less than $5000 to more than $75 000; however, because of the relatively small percentage of low-income women in our sample, we categorized income levels as less than $25 000, $25 000 to $49 999, and $50 000 or more. Likewise, because only 5 women had less than a high school education, we categorized education levels (i.e., highest level of education completed) as less than 4 years of college and 4 or more years of college or above.

Analyses

In preliminary analyses, we ascertained the univariate distribution of each variable among Black and White women, as well as the distribution after stratification according to preterm and LBW deliveries. On the basis of these preliminary analyses, we conducted logistic regression analyses examining associations between the outcomes of interest and variables significant at the descriptive level. The first model, designed to quantify the magnitude of the Black–White gap in preterm and LBW deliveries in the CARDIA population, included only race/ethnicity. Subsequent models included self-reported experiences of racial discrimination along with the specified potential modifiers and covariates. Finally, we included gestational age in the LBW model in an effort to determine whether the effects of racial discrimination on LBW were mediated by gestational age.

Because several women (n=29) gave birth to more than one infant between year 7 and year 10, we used the Huber–White sandwich estimator of variance[24,25] in our logistic regression models to account for violation of independent observations. Only one of these women delivered an LBW infant. All models were run on a sample that included first births only, but the results were not appreciably different. The sample included in the preterm models was made up of the 328 deliveries for which we had complete data on all covariates; 49 of these deliveries were preterm. The LBW model included the 320 deliveries for which we had complete data; 15 of these were LBW deliveries.

Because the sample size was small, we expected wide confidence intervals (CIs). Thus, we present results from Hosmer–Lemeshow goodness of fit tests[26] in which the data were reclassified into 8 groups of nearly equal size

TABLE 1—Univariate and Bivariate Distributions of Study Variables Among Black and White Women in the CARDIA Study, 1992–1995

	Black Women			White Women		
	Total (n = 152)	Preterm (n = 32)	LBW (n = 14)	Total (n = 200)	Preterm (n = 20)	LBW (n = 5)
Preterm delivery, %	21.1	100.0	84.6	10.0	100.0	60.0
LBW, %	9.0	39.3	100.0	2.5	15.0	100.0
Mean age, y, at year 10 examination (SD)	33.1 (3.3)	33.4 (3.2)	34.1 (2.6)	34.8 (3.2)	36.0 (3.0)	35.6 (2.7)
Education, %						
Less than college	75.3	81.3	76.9	29.4	40.0	25.0
College or more	24.7	18.8	23.1	70.6	60.0	75.0
Income, $, %						
< 24 999	44.2	48.4	41.7	12.2	15.8	0.0
25 000–49 999	37.4	35.5	33.3	31.6	42.1	50.0
≥ 50 000	18.4	16.1	25.0	56.1	42.1	50.0
Married, %	58.3	50.0	38.5	81.9	75.0	100.0
Mean pregnancy weight gain, kg (SD)	13.3 (6.6)	12.3 (7.0)	10.4 (7.2)	15.0 (4.8)	13.3 (5.1)	13.4 (3.6)
Mean net weight gain, kg (SD)	10.1 (6.5)	10.0 (6.9)	8.4 (7.2)	11.5 (4.7)	10.4 (5.2)	11.5 (3.7)
Racial discrimination experiences, %						
≥ 3	41.9	50.0	61.5	5.0	5.0	0.0
1–2	33.1	37.5	30.8	23.5	35.0	40.0
0	25.0	12.5	7.7	71.5	60.0	60.0
Does something about unfair treatment, %	79.1	78.1	84.6	86.5	100.0	80.0
Mean depressive symptomatology score (SD)	13.0 (8.5)	16.9 (11.2)	15.0 (8.3)	9.9 (7.4)	9.8 (10.3)	9.3 (8.2)
Prepregnancy smoking status, %						
Never smoked	68.4	56.3	38.5	57.0	35.0	40.0
Former smoker	7.9	9.4	15.4	27.5	35.0	40.0
Current smoker	23.7	34.4	46.2	15.5	30.0	20.0
Prepregnancy alcohol consumption, %	67.6	50.0	61.5	90.0	85.0	100.0
Toxemia, %	15.3	19.4	23.1	6.0	5.0	0.0
Gestational high blood pressure, %	8.6	9.7	23.1	2.0	0.0	0.0
Parity, mean (SD)	2.6 (1.5)	2.4 (1.2)	2.6 (1.3)	2.0 (1.0)	2.2 (1.3)	2.6 (1.5)
Mean gestational age, wk (SD)	38.7 (3.0)	34.2 (2.3)	34.7 (3.3)	39.3 (1.9)	35.3 (1.7)	35.6 (4.2)
Mean birthweight, kg (SD)	3.3 (0.6)	2.7 (0.7)	2.1 (0.5)	3.5 (0.5)	2.9 (0.7)	1.9 (0.5)

Note. LBW = low birthweight. Significant Black–White differences ($P < .05$; 2-tailed t test or χ^2 test) were found for all variables other than response to unfair treatment. Numbers of participants missing data varied according to characteristic and were small (between 1% and 5% of the cohort) except in the case of pregnancy weight gain, in which 10% of the cohort was missing data.

via ordering in terms of predicted probabilities. The Hosmer–Lemeshow statistic has an approximate χ^2 distribution, and a nonsignificant P value indicates good model fit. We ran several tests to assess multicollinearity (e.g., tolerance and R^2 analyses), and all values were within acceptable limits.

RESULTS

As can be seen in Table 1, Black and White women differed significantly in regard to all characteristics other than response to unfair treatment. In comparison with White women, Black women had substantially higher rates of preterm LBW deliveries, reported substantially more racial discrimination, had fewer socioeconomic resources (i.e., they had lower annual family incomes and less likely to have completed college), and were more likely to be unmarried, to report higher levels of depressive symptoms, to be nondrinkers, and to be current smokers. Also, they were more likely to have high rates of toxemia and gestational hypertension, to have had more births, and to show lower net gestational weight gain.

Distributions of covariates among the Black and White women with LBW or preterm deliveries were compared separately with distributions among women without these conditions and were found to differ only for drinking and depressive symptomatology (Table 1). Accordingly, we included these variables in our analytic model, along with education, income, smoking status, and net weight gain, given the established associations of these variables with outcomes previously reported in the literature. Variables pertaining to self-reported responses to unfair treatment, maternal health factors, elapsed time between birth and examination, and age did not differ significantly according to birth outcome among either Black or White women, and thus they were not included in the analytic model.

TABLE 2—Logistic Regression Analysis of Preterm Deliveries Among 328 Black and White Women in the CARDIA Study, 1992–1995

	Odds Ratio (95% Confidence Interval)			
	Model 1	Model 2	Model 3	Model 4
Race/ethnicity: Black vs White	2.54 (1.33, 4.85)	1.71 (0.84, 3.48)	1.88 (0.85, 4.12)	1.11 (0.51, 2.41)
Self-reported racial discrimination				
1 or 2 vs 0 experiences		1.97 (0.89, 4.38)		2.05 (0.93, 4.50)
≥3 vs 0 experiences		2.42 (1.03, 5.69)		3.05 (1.29, 7.24)
Smoking status				
Former vs never smoker			2.22 (0.89, 5.53)	2.00 (0.79, 5.05)
Current vs never smoker			2.59 (1.16, 5.82)	2.51 (1.13, 5.58)
Alcohol use: current vs not current			0.38 (0.18, 0.79)	0.30 (0.14, 0.66)
Depressive symptomatology: increase per unit score			1.03 (0.99, 1.07)	1.02 (0.98, 1.06)
Education: less than college vs college or more			0.83 (0.34, 2.04)	0.87 (0.19, 1.33)
Income, $				
25 000–49 999 vs <25 000			1.09 (0.50, 2.38)	1.08 (0.49, 2.38)
≥50 000 vs <25 000			0.90 (0.32, 2.54)	0.97 (0.36, 2.59)

Note. The Hosmer–Lemeshow goodness of fit test statistic was 8.22 ($P = .22$).

Discrimination and Preterm Delivery

Overall, Black women were 2.5 times as likely to have a preterm delivery as White women (Table 2, model 1). Adding racial discrimination alone (model 2) and the other covariates alone (model 3) to the model each reduced the race/ethnicity odds ratio (OR). In the full model (model 4), racial discrimination and the other covariates substantially reduced the race/ethnicity odds ratio from 2.54 to 1.11. Those reporting racial discrimination in 3 or more situations were at 3.1 times the risk of preterm delivery. Depressive symptomatology was not significantly associated with risk of preterm delivery, nor did it mediate the relationship between discrimination and preterm delivery. Smoking and alcohol consumption were associated with preterm delivery but, again, did not appear to mediate the relationship. The Hosmer–Lemeshow goodness of fit test statistic was not significant, indicating a good model fit.

Discrimination and Low Birthweight

As can be seen in Table 3, Black women were 4.2 times more likely to have an LBW delivery than White women (model 5). When self-reported experiences of racial discrimination were added to the model alone (model 6), the odds ratio for race/ethnicity was reduced. When the other covariates were added to the model alone (model 7), the race/ethnicity odds ratio increased. In the full model (model 8), women reporting high levels of racial discrimination were almost 5 times more likely than women reporting no racial discrimination to deliver LBW infants. Depressive symptoms, net pregnancy weight gain, and alcohol and tobacco consumption were not significantly asso-

TABLE 3—Logistic Regression Analysis of Low-Birthweight Deliveries Among 320 Black and White Women in the CARDIA Study, 1992–1995

	Odds Ratio (95% Confidence Interval)				
	Model 5	Model 6	Model 7	Model 8	Model 9
Race/ethnicity: Black vs White	4.24 (1.31, 13.67)	2.11 (0.75, 5.93)	5.90 (1.48, 23.52)	2.43 (0.79, 7.42)	3.97 (0.87, 18.14)
Self-reported racial discrimination					
1 or 2 vs 0 experiences		2.04 (0.50, 8.31)		1.96 (0.51, 7.56)	1.06 (0.29, 3.84)
≥3 vs 0 experiences		4.81 (1.50, 15.40)		4.98 (1.43, 17.39)	1.56 (0.32, 7.76)
Smoking status					
Former vs never smoker			3.51 (0.82, 15.13)	2.96 (0.77, 11.49)	3.73 (0.74, 18.93)
Current vs never smoker			1.99 (0.52, 7.69)	2.09 (0.56, 7.66)	2.42 (0.44, 13.40)
Alcohol use: current vs not current			0.76 (0.23, 2.46)	0.59 (0.18, 1.99)	1.15 (0.28, 4.68)
Depressive symptomatology: increase per unit score			1.02 (0.96, 1.07)	1.01 (0.96, 1.06)	0.96 (0.90, 1.02)
Education: less than college vs college or more			1.11 (0.31, 4.05)	1.07 (0.30, 3.83)	0.88 (0.24, 3.25)
Income, $					
25 000–49 999 vs <25 000			1.52 (0.46, 4.99)	1.43 (0.41, 4.97)	1.36 (0.27, 6.85)
≥50 000 vs <25 000			1.71 (0.33, 8.99)	1.59 (0.29, 8.86)	1.67 (0.33, 8.55)
Pregnancy net weight gain: risk per kg			0.96 (0.87, 1.06)	0.96 (0.87, 1.04)	0.95 (0.84, 1.07)
Gestational age: risk per additional week					0.54 (0.42, 0.68)

Note. The Hosmer–Lemeshow goodness of fit test statistic was 4.91 ($P = .56$).

ciated with LBW and did not mediate the relationship between discrimination and LBW. Finally, adding gestational age to the model (model 9) substantially reduced the parameter estimates for racial discrimination. The Hosmer–Lemeshow statistic was not significant, indicating a good model fit.

DISCUSSION

Racial discrimination may affect health outcomes in a variety of different ways through its influence on factors ranging from access to health care to exposure to noxious agents.[27] In this study, we tested the hypothesis that racial discrimination, as a psychosocial stressor, is associated with negative health outcomes. We found that high levels of self-reported experiences of racial discrimination were associated with both preterm and LBW deliveries and might contribute to Black–White disparities in these adverse birth outcomes. Smoking, alcohol use, and depressive symptoms did not appear to mediate the relationships between self-reported discrimination and adverse outcomes, although these relationships should be tested in a larger sample, with measurements taken during the pregnancy. In addition, our findings suggest that the association between racial discrimination and LBW may be mediated by gestational age.

Our findings are unlikely to be caused by biases in the measurement of race/ethnicity, marital status, education, or depressive symptoms. Problems pertaining to misclassification and bias, however, could have affected our data in the case of self-reports of racial discrimination, pregnancy weight gain, preterm delivery, and LBW.[28] These potential problems, however, were unlikely to have seriously affected our results for several reasons. First, regarding racial discrimination, the participants in this study reported levels of discrimination similar to those reported by the CARDIA sample as a whole. Moreover, these exposure levels were similar to those detected in the handful of other contemporary epidemiological studies and surveys that have quantified self-reports of racial discrimination.[29]

Second, although mothers reported birth-related data without clinical verification, previous research indicates that maternal recall of data on birthweight and gestational age are sufficiently accurate and unbiased by race/ethnicity to permit valid usage in epidemiological studies when data from birth records are unavailable.[30–33] In addition, there was no effect of elapsed time in our analyses. Nevertheless, access to clinically verified records would have strengthened our study.

Other limitations of the present study include the small sample size, the timing of measurements, and the lack of data on potentially relevant confounders. Our data were limited to births occurring after the year 7 CARDIA examination, the year in which the discrimination questionnaire was first administered. The resulting small sample size precluded analysis of models stratified according to race/ethnicity as well as testing of interactions. Similarly, our measures of socioeconomic position were limited to income and educational level; thus, our analyses may have been affected by residual confounding owing to unmeasured socioeconomic factors.

A related limitation of this study was the lack of data on several potentially important covariates for the time period under study, including onset of prenatal care, frequency of prenatal medical visits, prenatal alcohol and tobacco consumption, drug use, bacterial vaginosis,[34] and maternal experiences of violence during pregnancy.[10,16,17] Such variables may mediate the effects not only of race/ethnicity, but also of self-reported experiences of racial discrimination, on preterm and LBW deliveries. Although prepregnancy BMI was not significant when tested in a logistic model, our sample may have been too small to detect a relationship. Given the documented associations between prepregnancy BMI and birthweight[35–37] and between prepregnancy BMI, gestational weight gain, and birthweight,[38,39] future studies should examine the relationships among racial discrimination, prepregnancy BMI, gestational weight gain, and LBW.

Bias also could have been introduced by differential attrition rates, affecting estimates of outcomes as well as covariates. Notably, women not included in the present analyses were less educated, less likely to be married, and more likely to be Black than the study participants, and they had more depressive symptoms. Thus, our findings may have underestimated the effects of education, depressive symptoms, and marital status on the risk of LBW and preterm deliveries. Given that depressive symptoms may mediate the relationship between self-reported discrimination and perinatal outcomes, we may have missed a potential relationship. It is unlikely that differential attrition according to education or marital status affected the relationships between self-reported discrimination and the outcomes under study.

Another limitation was the older age range of the individuals who took part in this study. The mean age of mothers was 34 years, whereas the majority of births in America occur among women in their 20s.[1] Similarly, given that CARDIA's sampling design was stratified according to race/ethnicity and education, our findings are not representative of the general population. Finally, we did not include data on preexisting chronic medical conditions or previous preterm deliveries, which could have affected the likelihood of poor perinatal outcomes.

Despite these limitations, two strands of evidence lend plausibility to our findings. First, as noted earlier, 2 recently published studies, one focusing on extremely LBW deliveries (less than 1500 g) and the other focusing on preterm deliveries, both showed that increased risks were associated with self-reported racial discrimination. The first study, conducted by Collins et al.,[11] was a small case–control investigation (25 case patients and 60 controls) restricted to a population of poor Black women with no private health insurance. Its central finding was that self-reported episodes of racial discrimination among low-income African American mothers were associated with deliveries of extremely LBW infants.[27,40]

The second study, conducted by Dole et al., involved data derived from a large, prospective cohort study of risk factors for preterm births that included 2073 White women and 1604 Black women.[12] Using the same discrimination measures used in this study, these authors found that high levels of self-reported racial discrimination were associated with somewhat lower but still increased risks of preterm delivery (adjusted OR=1.4, 95% CI=1.0, 2.0). Possibly contributing to their lower estimates were differences in the racial/ethnic distributions of the recruitment areas and differences in the ages of the mothers. Women in the CARDIA sample were from urban areas with substantially higher percentages of Whites than the women in the Dole et al. study, who were from a predominantly Black region of central North Carolina and, thus, potentially had a lower likelihood of interacting with White residents. The younger mothers in the Dole et al. study may have accumulated less exposure to discrimination, and, of note, the "weathering hypothesis" indicates that the effects of social inequality on health increase with age.[41,42] However, notwithstanding such differences, the Dole et al. findings were similar to the findings of this study.

By contrast, a study focusing on racial discrimination and preterm deliveries conducted by Rosenberg et al.[43] showed little association between perceived racism and risk of preterm delivery. These authors, however, used different measures of self-reported discrimination and analyzed each item separately rather than assessing summed items. Use of noncomparable measures complicates comparisons of findings, further underscoring the importance of developing short, validated measures that can be used and compared across diverse epidemiological studies.[27,44,45]

A second strand of support for our findings stems from research in which the hypothesis that chronic stress can increase the risk of both preterm and LBW deliveries has been evaluated with data on biological parameters that we did not have available. Specifically, evidence indicates that psychological stress may trigger corticotropin-releasing hormone, which has been linked to preterm deliveries (see review by Rich-Edwards et al.[10]). Both animal and human studies suggest that stress can lead to immunosuppression, susceptibility to infection, and preterm birth.[46–48] Immunocompromise has been linked to bacterial vaginosis,[34,49] which in turn has been associated with preterm births.[50] Neuroendocrine or immunological responses to the chronic stress generated by racial discrimination may in part explain the association between self-reported racial discrimination and risk of preterm and LBW deliveries we observed and should be investigated in a study focusing explicitly on pregnancy outcomes.

In addition, evidence on links between gestational hypertension and adverse birth outcomes[51,52] suggests an alternative pathway whereby racial discrimination elevates the risk of gestational hypertension, thus affecting birth outcomes. In our sample, gestational hypertension was reported more frequently by Black than by White women, and the risk of LBW deliveries was elevated among Black women reporting gestational hypertension. Although our sample was too small to investigate a causal path leading from perceived discrimination to elevated blood pressure and adverse birth outcomes, future research should address this issue.

Despite the limitations noted, this study provides important evidence that a relationship exists between self-reported experiences of racial discrimination and preterm and LBW deliveries. In doing so, it adds to the small but growing body of literature[18–21] suggesting that racial discrimination, rather than "race" construed as "innate biology,"[40] underlies racial/ethnic disparities in health and places Black women and children—and potentially women and children who are members of other racial/ethnic groups—at risk for serious health consequences. ■

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Contributors

S. Mustillo conceived and designed the study, analyzed the data, and wrote the initial draft of the article. N. Krieger supervised and contributed to the conception and design of the study, the analysis and interpretation of the data, and the drafting of the article. E.P. Gunderson, H. McCreath, and C.I. Kiefe contributed to the analysis and interpretation of the data. S. Sidney, H. McCreath, and C.I. Kiefe contributed to acquisition of the data. All of the authors were involved in revisions of the article.

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Human Participant Protection

All examinations were approved by the institutional review boards at the participating institutions, and informed consent was obtained from each study participant.

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