Summary Points

- In Virginia, the Black infant mortality rate is two times higher than the state rate and 2.5 times higher than the White infant mortality rate; the preterm birth rate among Black women is 52% higher than the rate among women of all other race/ethnicities.
- This research seeks to explore racial discrimination as a factor underlying persistent disparities using PRAMS and birth certificate data.
- Future studies should focus on potential confounders, and the social and economic context in which women live to further examine the causes of racial inequities in health.

EXAMINING THE INFLUENCE OF RACIAL DISCRIMINATION ON ADVERSE BIRTH OUTCOMES: AN ANALYSIS OF THE VIRGINIA PREGNANCY RISK ASSESSMENT MONITORING SYSTEM (PRAMS), 2016–2020

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Background

Non-Hispanic (NH) Black women are twice as likely to experience infant loss in Virginia compared to their NH White counterparts. Infant mortality rates are often used as indicators of the health and well-being of a population. In Virginia, the leading cause of infant mortality is disorders related to short gestation and low birth weight, and Black women have a prematurity rate that is 52% higher than all other women in the state.

The persistence of the disparities in maternal and infant health has driven the need to look beyond race-associated differences. Due to the historical context of the U.S., risk and protective factors may look different for racial and ethnic groups, leading to the need to examine differential exposure to social and environmental risk factors, bias and racism, and cumulative stress. Previous studies have found an association between the experience of discrimination and adverse birth outcomes; however, some findings may be underpowered due to small sample sizes and the use of self-report for outcomes as opposed to birth certificate data. Therefore, the current study seeks to use population based data to answer the question: Is the experience of discrimination or harassment due to race and ethnicity a risk factor for poor birth outcomes in Virginia?

Methods

This secondary data analysis used data from the 2016–2020 (Phase VIII) Virginia Pregnancy Risk Assessment Monitoring System (PRAMS) to examine the association between experiencing discrimination or harassment due to race/ethnicity and adverse birth outcomes (i.e., preterm birth, low birth weight, and small for gestational age) among women ages 15–44. PRAMS was initiated by the Centers for Disease Control and Prevention (CDC) to decrease infant mortality and morbidity. Each state participating in PRAMS conducts stratified random sampling to select women from birth certificates 2–4 months after the infant is born.

PRAMS personnel administer a survey via mail, and if selected participants do not respond, they are contacted by telephone. Data were collected from a sample of women on maternal attitudes and behaviors before, during, and after pregnancy via questionnaire. These questionnaires are linked to birth certificates that provide additional demographic and medical information. Participants are weighted to be representative of all women giving birth in the respective state.

The exposure in this study was experiencing discrimination or harassment due to race/ethnicity (i.e., racial discrimination). To assess the exposure, the following PRAMS questions were used: "During the 12 months before your new baby was born, did you feel emotionally upset (for example, angry, sad, or frustrated) as a result of how you were treated based on your race?" and "During the 12 months before your new baby was born, did you experience discrimination, harassment, or were you made to feel inferior because of your race, ethnicity, or culture?" If the participant responded "yes" to either of these questions, she was considered to be exposed. Information on the outcomes was extracted from birth certificate data. A preterm birth was defined as an infant born at less than 37 full weeks gestation. Low-birth-weight was defined as an infant born weighing less than 5 pounds, 8 oz (2500 g). Lastly, if the infant's birth certificate indicated that the infant was small for gestational age based on 10th percentile, meaning their length, weight, and/or head circumference was smaller than 90% of infants of the same gestational age and sex, the participant was considered to have the small for gestational age outcome.

Simple logistic regression was used to obtain the association between experiencing racial discrimination and adverse birth outcomes and to identify risk factors for experiencing racial discrimination. Multivariate logistic regression was used to calculate adjusted odds ratios and 95% confidence intervals, while controlling for potential confounders.

Results

Women who were younger than 15 years or older than 44 years (n = 61), and those who were missing information on race/ethnicity (n = 9), the exposure of interest (n = 116), and any of the outcomes (n = 125) were excluded from the study. Therefore, 4,532 participants remained in the analysis. The majority of participants were NH White (n = 2,588); there were 958 NH Black participants and 986 participants of other race/ethnicities (376 Hispanic and 610 non-Hispanic other).

Approximately 5% (n = 109) of NH White, 18% (n = 197) of NH Black participants, and 14% (n = 151) of other participants experienced discrimination or harassment due to their race/ethnicity. Of all participants, NH Black participants had the highest percentage of adverse birth outcomes and the experience of racial discrimination **(Figure 1)**.

Among NH Black participants who experienced racial discrimination, 14.3% (n = 39) had a preterm birth, 12.7% (n = 39) had a low-birth-weight infant, and 12.8% (n = 30) had an infant who was small for gestational age. When all participants were included in the analyses, the experience of racial discrimination was not found to be associated with preterm birth, low birth, nor small for gestational age **(Table 1)**. However, when stratified by race, only NH Black women had statistically significant increased odds of adverse birth outcomes for those who experienced racial discrimination compared to those who did not. NH Black women who experienced racial discrimination had over two times the odds of preterm birth (OR 2.69; 95% CI 1.02, 7.23; p=0.05) compared to NH Black women who did not experience racial discrimination; these findings were statistically significant.

Figure 1. Experience of Racism and Adverse Birth Outcomes by Race/Ethnicity, VA PRAMS 2016-2020

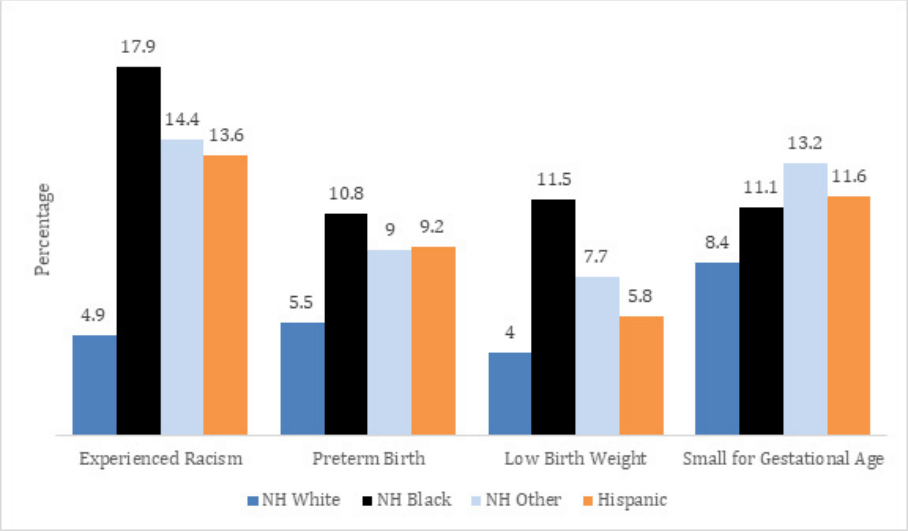

Table 1. Adjusted[a-i] odds ratios and 95% confidence intervals for the association between experiencing discrimination due to race/ethnicity and preterm birth, low birth weight, and small for gestational age, 2016–2020 VA PRAMS

Experienced discrimination or harassment due to race/ethnicity	Preterm Birth		Low Birth Weight		Small for Gestational Age	
All participants	**OR[a]**	**95% CI**	**OR[b]**	**95% CI**	**OR[c]**	**95% CI**
Yes	1.66	0.95, 2.92	1.36	0.74, 2.47	1.15	0.70, 1.90
No	1.00	Referent	1.00	Referent	1.00	Referent
NH white participants	**OR[d]**	**95% CI**	**OR[e]**	**95% CI**	**OR[f]**	**95% CI**
Yes	1.95	0.61,6.21	0.69	0.14, 3.35	1.87	0.70, 5.00
No	1.00	Referent	1.00	Referent	1.00	Referent
NH Black participants	**OR[g]**	**95% CI**	**OR[h]**	**95% CI**	**OR[i]**	**95% CI**
Yes	2.69	1.02, 7.23	1.43	0.57, 3.56	2.36	0.91, 6.13
No	1.00	Referent	1.00	Referent	1.00	Referent

[a]**Model** adjusted for race/ethnicity, age, and education.

[b]**Model** adjusted for race/ethnicity, age, income, and health insurance status.

[c]**Model** adjusted for race/ethnicity, education, income, and marital status.

[d]**Model** adjusted for age, education, income, and marital status.

[e]**Model** adjusted for age, education, income, health insurance status, and marital status.

[f]**Model** adjusted for age, education, income, health insurance status, and marital status.

[g]**Model** adjusted for age, education, income, drinking during pregnancy, BMI, and gestational diabetes.

[h]**Model** adjusted for age, income, and health insurance status.

[i]**Model** adjusted for age, income, education, and drinking during pregnancy.

Discussion

Virginia women who experienced racial discrimination did not experience statistically significant increased odds of having any adverse birth outcomes; however, when stratified by race, only NH Black women had statistically significant increased odds of adverse birth outcomes (over two times the odds of preterm birth).

The current study has some weaknesses and many strengths. Because the exposure variable was self-reported, nondifferential misclassification of the exposure and perception or minimization bias are all possible. The outcome variables, preterm birth, low birth weight, and small for gestational age, were obtained directly from birth certificates. Thus, a strength of this study is that the potential for information bias and nondifferential misclassification of the outcomes was limited. An additional strength is that due to the fact that PRAMS utilizes a random sampling process and response rates for the VA PRAMS were relatively high, the potential for selection bias was reduced. However, women who participated in the study may have differed from women who did not; for example, women who participated may have been more conscious of their health compared to women who did not participate.

In addition, the examination of potential confounding variables was limited to variables available in VA PRAMS data; failure to control for other known or unknown confounders may have resulted in an over- or underestimation of the true association. Lastly, due to the VA PRAMS complex sampling design, generalizability of this study is increased, meaning results may be generalized to women of reproductive age residing in Virginia or other similar states. This study demonstrates that the experience of racial discrimination, along with other factors, impact adverse birth outcomes.

The likelihood of having a low birth weight infant was increased among women who experienced racial discrimination, while the likelihood of having a preterm birth and low birth weight infant was particularly great among NH Black women. Efforts to effectively reduce adverse birth outcomes and eliminate racial inequities must consider upstream, holistic approaches that venture outside of the biomedical model. Future studies should focus on potential confounders, and the social and economic context in which women live, to further examine the causes of racial inequities in health. In addition, future researchers examining this association may want to specify the exposure, racial discrimination, by setting (i.e., health care settings or society in general). Programs that reduce discrimination such as Racial and Ethnic Approaches to Community Health (REACH) and implicit bias training should be implemented more widely in Virginia. Tracking racial discrimination and adverse birth outcomes using PRAMS and birth certificate data in Virginia should continue in order to assure that the negative effect of racial discrimination on birth outcomes among Black women is eliminated.

VDH VIRGINIA DEPARTMENT OF HEALTH

VIRGINIA PRAMS Pregnancy Risk Assessment Monitoring System

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