

Variation in the Content of Postpartum Visits by Maternal Race/Ethnicity, Preconception, and Pregnancy-Related Cardiovascular Disease Risk, PRAMS, 2016-2017

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Abstract

Objectives: Limited evidence suggests racial/ethnic disparities in postpartum visit attendance; however, little is known about patterns in postpartum visit content. We sought to determine whether receipt of screening and counseling varies by race/ethnicity and whether cardiovascular disease (CVD) risk (preconception or pregnancy related) predicts postpartum visit content.

Methods: We used data from the Pregnancy Risk Assessment Monitoring System 2016-2017 (39 sites) to calculate the prevalence of self-reported receipt of screening, services, and counseling at the postpartum visit by race/ethnicity and CVD risk (unweighted analytic sample $n = 59\,427$). We created a score representing receipt of 5 key screenings or messages at the visit (counseling on healthy eating and exercise, cigarettes, pregnancy spacing, and birth control methods; screening for depression), which we used as a binary indicator of visit content in regression models. We fit a logistic regression model to determine the magnitude of association between CVD risk and receipt of the 5 key messages, prevention screening, or CVD-specific counseling (on healthy eating and exercise, smoking), adjusting for maternal age, race/ethnicity, and health insurance status.

Results: Overall, 40% of women reported receiving all CVD-specific prevention messages. Both prepregnancy and pregnancy-related CVD risk were associated with increased odds of receipt of CVD prevention messages (adjusted odds ratios [aOR] = 1.2; 95% CI, 1.1-1.3; and 1.1; 95% CI, 1.1-1.2, respectively). Race/ethnicity was a stronger predictor than CVD risk: non-Hispanic Black women were twice as likely as non-Hispanic White women to receive CVD prevention messages, regardless of CVD risk (aOR = 1.9; 95% CI, 1.7-2.0).

Conclusions: Health systems should consider novel strategies to improve and standardize the content of postpartum visits.

Keywords

PRAMS, postpartum, cardiovascular disease prevention, health promotion

Each year, about 16% of pregnant people in the United States experience incident cardiometabolic dysfunction during pregnancy, either a hypertensive disorder of pregnancy (10%) or gestational diabetes (6%).¹⁻³ Both disorders require intensive monitoring during pregnancy, potentially with antihypertensive medication or insulin for severe cases. People who experience either outcome during their pregnancy are at increased risk of adverse maternal and infant outcomes and cardiovascular disease (CVD), incident diabetes, and metabolic syndrome after pregnancy.⁴⁻⁷ Similarly, people who experience a preterm birth or other adverse birth outcome are also at elevated CVD risk.^{6,8,9}

All patients should attend a postpartum visit 6-12 weeks after delivery and a checkup 1 year after delivery.¹⁰

Postpartum follow-up allows for identification of people at high risk for later CVD, disease management, and prevention of progression to more severe disease.¹¹ Guidance from

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the American College of Obstetricians and Gynecologists (ACOG) recommends that postpartum visits should include a comprehensive assessment of patients' mental, physical, and social well-being.¹⁰ For people who experienced gestational diabetes, a hypertensive disorder of pregnancy, or preterm birth, ACOG recommends counseling and screenings on CVD risk. After a pregnancy complicated by gestational diabetes, patients should receive diabetes screening (most commonly a glucose tolerance test) 4-12 weeks after delivery. People who experienced a hypertensive disorder of pregnancy should receive postpartum blood pressure monitoring, including a blood pressure screening at 10 days postpartum, and a second check 6 weeks postpartum, as well as risk counseling.

Not all people receive recommended postpartum screenings. Limited evidence suggests that only half of people diagnosed with hypertensive disorders during pregnancy return for a recommended 10-day postpartum blood pressure screening.¹² In a 2020 meta-analysis, fewer than half of people diagnosed with gestational diabetes received postpartum diabetes screening (42%)¹³; screening rates were lowest among non-Hispanic Black (33%) and non-Hispanic White (35%) people, respectively, and highest among Asian people (50%).^{13,14} This disparity is problematic because evidence suggests that non-Hispanic Black people are more likely than people of any other racial/ethnic group to progress to type 2 diabetes after a pregnancy complicated by gestational diabetes.¹⁵

The racial/ethnic disparities in postpartum screening are accompanied by narratives of racism in health care provider-patient communication during pregnancy and postpartum. A 2019 scoping review presented evidence of both perceived and objective discrimination and bias in messaging and referrals concerning breast-feeding.¹⁶ Similarly, in qualitative interviews with women of color in San Francisco (Black, Hispanic, Asian, multiracial), participants described bias and a perception that health care providers withheld information to try and push them into care plans.¹⁷ Although limited quantitative evidence exists on whether content of postpartum or prenatal visits varies by maternal race/ethnicity, evidence on racial/ethnic disparities in care and outcomes may support the existence of racial/ethnic bias in perinatal care.^{18,19}

Despite recommendations for CVD risk screening and counseling postpartum, little information exists on what screenings, services, and counseling people receive during the postpartum period. Improved understanding of what takes place during the postpartum visit and variation by CVD risk and race/ethnicity may allow for targeted strategies for improvement and provide context for qualitative evidence on discrimination in perinatal care.

The objectives of our analysis were to (1) describe the self-reported screenings, services, and counseling received during the postpartum visit among participants in the Pregnancy Risk Assessment Monitoring System (PRAMS)

2016-2017 and potential variation by race/ethnicity and (2) determine whether people at elevated risk for CVD are more likely to receive CVD-related counseling during the postpartum visit than people at low risk for CVD.

Methods

Study Population

We used data from the PRAMS Phase 8 questionnaire, years 2016-2017 (39 sites with response rates >55%; n = 222 290 sampled participants). This project was approved by the Centers for Disease Control and Prevention PRAMS team and deemed not to need further institutional review board approval because it was a secondary data analysis of deidentified data. PRAMS is a sample of live births in each calendar year in participating sites (US state or territory).²⁰ Each site may choose groups to oversample in a given year, based on data needs (eg, people who delivered a low-birth-weight infant). The Centers for Disease Control and Prevention creates a combined data set with appropriate weights to account for stratification and to present a representative sample of people who delivered a live-born infant in each site.²¹ People are invited to participate by mail and complete surveys by mail or telephone 2-6 months after delivery. Because of high self-reported attendance at the postpartum visit (>90%) and an interest in what happened during the visit, we restricted analysis to participants who attended the postpartum visit (excluded n = 7977); had complete information on gestational diabetes, preterm birth, and hypertensive disorders (excluded n = 1070); had complete information on postpartum visit content (excluded n = 1871); and had complete information on covariates (age, race/ethnicity, health insurance, and prepregnancy risk, excluded n = 4401). Of participants who attended the postpartum visit, 8.2% were excluded because of missing information. The proportion of observations with missing information did not differ by receipt of postpartum messages. Our final analytic sample was 59 427 (weighted to represent 3 270 404 postpartum people).

Dependent Variable

For participants who report attending a postpartum checkup, PRAMS Phase 8 asks, "Did a doctor, nurse, or other health care worker *do* any of the following things?" Items included "Tell me to take a vitamin with folic acid"; "Talk to me about healthy eating, exercise, and losing weight gained during pregnancy"; "Talk to me about how long to wait before getting pregnant again"; "Talk to me about birth control methods I can use after giving birth"; "Ask me if I was smoking cigarettes"; "Ask me if someone was hurting me emotionally or physically"; "Ask me if I was feeling down or depressed"; and "Test me for diabetes." Responses were dichotomous (yes/no).

We created 2 scores to summarize self-reported receipt of screening and counseling: (1) a broad indicator of whether a participant reported all 5 ACOG-recommended screenings or messages (reported counseling on healthy eating and exercise, cigarettes, pregnancy spacing, and birth control methods; and screening for depression)¹⁰ and (2) whether a participant reported receiving 2 CVD-specific prevention-related messages (reported counseling related to cigarette smoking and healthy eating and exercise). Ultimately, all 5 items in the broad indicator relate to CVD risk, because prevention of unwanted pregnancies, adequate pregnancy spacing, and treatment of depression all contribute to reducing CVD risk across the life course. However, we also included the 2-item summary measure because counseling on smoking and weight loss may be explicitly targeted toward patients at high risk for CVD. For analysis, we considered both scores as dichotomous (yes, received all 5 messages; no, received ≤ 4 messages). Each site has the option of adding questions (eg, “Ask me about other prescription drugs” or “Talk to me about alcohol use”). We summarized the results for these questions in a descriptive table, but we did not include these data in either scale because they are available only for Michigan (n = 2980).

Independent Variables

High-risk pregnancy. Participants were classified as having ≥ 1 prenatal risk factor for CVD if they had gestational diabetes, a hypertensive disorder, or a preterm birth for this pregnancy recorded on the birth certificate. This score was dichotomous (1, ≥ 1 diagnosis; 0, no diagnoses). We used diagnoses from the birth certificate for consistency and because of the potential for overreporting of pregnancy complications on PRAMS.²²

Preconception CVD risk score. We created a preconception CVD risk score based loosely on the Life’s Simple 7,²³ using data available from PRAMS on risk factors reported before pregnancy. Our scale is a sum of whether participants reported obesity, high-risk drinking (>7 drinks per week), a hypertension diagnosis, a diabetes diagnosis, and smoking, for a range of 0-5 (0 = reporting no items; 5 = reporting all 5 items). If an item was missing, we coded it as not reported. Information on prepregnancy drinking was missing for 1% of eligible participants (n = 645) and on prepregnancy smoking for 0.7% of eligible participants (n = 433); participants missing those values were coded as not having the risk factor. In multivariable analysis, we included this scale as a dichotomous indicator of reporting or not reporting ≥ 1 risk factor for CVD before pregnancy.

Other Covariates

We included information on participant race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic,

non-Hispanic “other” [ie, identifying as Asian, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, other/mixed]), age (<24 , 24-34, ≥ 35 y), and health insurance (private, public, none). We considered health insurance before pregnancy because people who enrolled in health insurance specifically for pregnancy may lose it before the postpartum visit. Preconception health insurance may better represent the heterogeneity of risk and health insurance status at the time of the postpartum visit.

Analysis

We conducted all analyses using SAS version 9.4 survey procedures (PROC SURVEYLOGISTIC; SAS Institute, Inc) or SUDAAN version 11.01.3 (PROC CROSSTAB; RTI International) to account for sample weights due to the complex survey design. We summarized the self-reported prevalence of maternal characteristics stratified by receipt of the 5 ACOG-recommended screenings or messages. We examined the self-report of each message by maternal race/ethnicity. Finally, we fit a multivariable logistic regression model to quantify the association between pregnancy-specific CVD risk and receipt of the 5 ACOG messages. We controlled for factors selected a priori as potentially associated with postpartum visit content and CVD risk. We tabulated crude odds ratio (OR) estimates and adjusted ORs (aORs), controlling for maternal race/ethnicity, age, health insurance status, and preconception CVD risk (≥ 1 preconception risk factor vs no preconception risk factors). We found no evidence of collinearity.

Results

Most participants (90.1%) returned for a postpartum visit (Table 1). This proportion varied slightly by race/ethnicity, with the lowest attendance among Hispanic participants (85.2%) and the highest attendance among non-Hispanic White participants (92.5%). Among participants who attended the postpartum visit, self-reported content varied. The most commonly reported message was talking about birth control (88.8%), followed by depression screening (83.6%), and this pattern was similar across racial/ethnic groups. However, the prevalence of specific messages varied. Generally, non-Hispanic Black and Hispanic participants were the most likely to report receiving prevention-oriented messages, and non-Hispanic White participants were the least likely to report receiving prevention-oriented messages. For example, 68.0% of non-Hispanic Black participants and 68.3% of Hispanic participants reported that their health care provider counseled them on smoking, compared with 52.6% of non-Hispanic White participants. Twenty-nine percent of participants reported receiving all 5 ACOG-recommended messages (ie, counseling on smoking, healthy eating and exercise, pregnancy spacing, and birth control methods, and depression

Table 1. Reported content of postpartum visit (physician or health care worker advice or screenings), stratified by self-reported race/ethnicity (N = 59 427), Pregnancy Risk Assessment Monitoring System, 2016-2017^a

Visit content	Total	Race/ethnicity, % (SE)			
		Non-Hispanic White	Non-Hispanic Black	Hispanic	Other
Any postpartum visit	90.1 (0.2)	92.5 (0.2)	87.3 (0.6)	85.2 (0.5)	89.3 (0.5)
Counseling on:					
Smoking	57.9 (0.3)	52.6 (0.4)	68.0 (0.8)	68.3 (0.8)	55.8 (0.9)
Vitamin	56.9 (0.3)	54.8 (0.4)	57.4 (0.9)	61.3 (0.8)	61.0 (0.9)
Waiting before your next pregnancy	48.7 (0.3)	44.8 (0.4)	56.1 (0.9)	51.7 (0.8)	56.6 (0.9)
Healthy eating and exercise and losing weight gained during pregnancy	56.9 (0.3)	52.1 (0.4)	69.1 (0.8)	61.0 (0.8)	62.4 (0.9)
Alcohol use ^b	49.8 (1.2)	43.7 (1.5)	67.0 (1.4)	67.9 (4.8)	54.1 (4.3)
Birth control	88.8 (0.2)	89.1 (0.3)	88.7 (0.6)	88.2 (0.5)	88.3 (0.6)
Intimate partner violence (emotional or physical)	54.8 (0.3)	48.0 (0.4)	67.9 (0.8)	66.1 (0.8)	56.2 (0.9)
Other prescription drugs ^b	72.2 (1.1)	72.6 (1.3)	69.8 (1.4)	68 (4.8)	77.1 (3.6)
Depression screening	83.6 (0.2)	84.3 (0.3)	82.7 (0.7)	83.9 (0.6)	80.4 (0.8)
Two CVD prevention-related messages ^c	39.5 (0.3)	33.7 (0.4)	53.4 (0.9)	47.5 (0.8)	41.3 (0.9)
Five key messages ^d	29.0 (0.3)	23.5 (0.4)	41.1 (0.9)	37.1 (0.8)	31.9 (0.9)
Test for diabetes ^e	58.9 (1.3)	53.0 (1.8)	65.2 (3.7)	66.0 (3.2)	65.3 (3.0)
Birth control prescription	45.5 (0.3)	42.9 (0.4)	52.8 (0.9)	49.7 (0.8)	43.1 (0.9)
Insertion of intrauterine device or implant	19.8 (0.3)	17.4 (0.3)	23.2 (0.8)	25.2 (0.7)	20.0 (0.7)

Abbreviation: CVD, cardiovascular disease.

^aIncluded sites: Alabama (2017), Alaska (2016, 2017), Arkansas (2016), Colorado (2016, 2017), Connecticut (2016, 2017), Delaware (2016, 2017), Georgia (2017), Hawaii (2016), Illinois (2016, 2017), Iowa (2016, 2017), Kentucky (2017), Louisiana (2016, 2017), Maine (2016, 2017), Maryland (2016, 2017), Massachusetts (2016, 2017), Michigan (2016, 2017), Missouri (2016, 2017), Montana (2017), Nebraska (2016), New Hampshire (2016, 2017), New Jersey (2016, 2017), New Mexico (2016, 2017), New York City (2016, 2017), New York State (2016, 2017), North Carolina (2017), North Dakota (2017), Oklahoma (2016, 2017), Pennsylvania (2016, 2017), Rhode Island (2016, 2017), South Dakota (2017), Texas (2016), Utah (2016, 2017), Vermont (2016, 2017), Virginia (2016, 2017), Washington (2016, 2017), West Virginia (2016, 2017), Wisconsin (2016, 2017), Wyoming (2016, 2017), Puerto Rico (2017). Data sources: Centers for Disease Control and Prevention²⁰ and Shulman et al.²¹

^bAvailable only for Michigan respondents (n = 2980).

^cTwo key messages include counseling on healthy eating and exercise (asked together) and smoking.

^dThe 5 key messages were depression screening and counseling on smoking, eating and exercise, pregnancy spacing, and birth control methods, adapted from recommendations from the American College of Obstetricians and Gynecologists.¹⁰

^eAmong people with a diagnosis of gestational diabetes.

screening). However, only 23.5% of non-Hispanic White participants, compared with 41.1% of non-Hispanic Black participants and 37.1% of Hispanic participants, received counseling on all 5 messages. When we examined only receipt of the 2 messages specific to CVD prevention (smoking, healthy eating and exercise), 39.5% of all participants reported receiving both messages, with a similar pattern. The pattern was similar when we restricted analysis to participants who had experienced a hypertensive disorder, gestational diabetes, or preterm birth.

The prevalence of most preconception, prenatal, and postpartum CVD risk factors was slightly higher among participants who received counseling on all 5 postpartum messages or screenings as compared with participants who reported receiving counseling on ≤4 postpartum messages (Table 2). For example, compared with participants who reported receiving counseling on ≤4 postpartum messages, participants who reported receiving counseling on all 5 postpartum messages were more likely to be obese before pregnancy (26.3% vs 21.9%), to smoke before pregnancy (18.3% vs

14.9%), to have a CVD complication during pregnancy (22.5% vs 19.3%), and to report smoking postpartum (12.4% vs 9.0%) and less likely to report any drinking before pregnancy (63.0% vs 51.4%).

After adjusting for age, race/ethnicity, preconception CVD risk, and preconception health insurance status, participants with a high-risk pregnancy complication (gestational diabetes, hypertensive disorder, or preterm birth) had 20% higher odds of receiving counseling on all 5 ACOG messages (aOR = 1.2; 95% CI, 1.1-1.3) than participants without a pregnancy complication, and participants with ≥1 preconception CVD risk factor had 20% higher odds of receiving counseling on all 5 ACOG messages (aOR = 1.2; 95% CI, 1.1-1.3) than participants with no CVD risk factors (Table 3). Compared with non-Hispanic White participants, non-Hispanic Black participants and Hispanic participants had 90% (aOR = 1.9; 95% CI, 1.7-2.1) and 70% (aOR = 1.6; 95% CI, 1.5-1.8) higher odds, respectively, of receiving counseling on all 5 ACOG messages. We found no multiplicative interaction between pregnancy complications and

Table 2. Indicators of CVD risk preconception, during pregnancy, and postpartum, by receipt of 5 key postpartum messages,^a Pregnancy Risk Assessment Monitoring System Phase 8 (N = 59 427), 2016-2017^b

Indicators of risk	Total population, % (SE)	Receipt of 5 key messages, % (SE)	
		Yes ^a	No
Preconception			
Body mass index			
Underweight	7.1 (0.2)	8.0 (0.3)	6.7 (0.2)
Normal	45.0 (0.3)	41.6 (0.6)	46.8 (0.4)
Overweight	24.5 (0.3)	24.1 (0.5)	24.7 (0.4)
Obese	23.3 (0.3)	26.3 (0.6)	21.9 (0.3)
Primiparous ^c	60.6 (0.3)	58.6 (0.6)	61.1 (0.4)
Exercise 3 times per week in year before pregnancy	43.9 (0.6)	42.8 (1.2)	44 (0.8)
Drinking (any) in 3 mo before pregnancy	59.5 (0.3)	51.4 (0.6)	63 (0.4)
≥8 Drinks per week before pregnancy	3.9 (0.2)	3.3 (0.3)	4.2 (0.2)
Hypertension	5.1 (0.1)	5.4 (0.3)	5.0 (0.2)
Diabetes	3.5 (0.1)	3.3 (0.2)	3.6 (0.2)
Depression	12.1 (0.2)	12.0 (0.4)	12.1 (0.3)
Previous preterm birth	3.2 (0.1)	3.5 (0.2)	3.0 (0.1)
Smoked (any) in 3 months before pregnancy	16.3 (0.2)	18.3 (0.5)	14.9 (0.3)
Simple risk score ^d	0.5 (0.01)	0.6 (0.01)	0.5 (0.01)
≥1 Prepregnancy CVD risk factor	39.0 (0.3)	42.7 (0.6)	37.1 (0.4)
Pregnancy			
Preterm birth	8.7 (0.2)	9.6 (0.4)	8.1 (0.2)
Gestational diabetes diagnosis	6.1 (0.2)	7.0 (0.3)	5.8 (0.4)
Hypertensive disorder of pregnancy diagnosis	8.5 (0.2)	9.9 (0.3)	8.5 (0.4)
Any high-risk pregnancy outcome ^e	20.1 (0.2)	22.5 (0.5)	19.3 (0.3)
Postpartum			
Smoking now (any/none)	10.3 (0.2)	12.4 (0.4)	9.0 (0.2)
Ever breastfed	88.9 (0.2)	87.4 (0.4)	89.8 (0.3)
Breastfed ≥1 mo	74.1 (0.3)	71.4 (0.6)	75.1 (0.4)
Breastfed ≥3 mo	45.4 (0.3)	42.1 (0.6)	46.7 (0.4)
Currently using postpartum birth control	80.6 (0.3)	81.4 (0.5)	79.5 (0.3)

Abbreviation: CVD, cardiovascular disease.

^aThe 5 key messages were depression screening and counseling on smoking, eating and exercise, pregnancy spacing, and birth control methods, adapted from recommendations from the American College of Obstetricians and Gynecologists.¹⁰

^bIncluded sites: Alabama (2017), Alaska (2016, 2017), Arkansas (2016), Colorado (2016, 2017), Connecticut (2016, 2017), Delaware (2016, 2017), Georgia (2017), Hawaii (2016), Illinois (2016, 2017), Iowa (2016, 2017), Kentucky (2017), Louisiana (2016, 2017), Maine (2016, 2017), Maryland (2016, 2017), Massachusetts (2016, 2017), Michigan (2016, 2017), Missouri (2016, 2017), Montana (2017), Nebraska (2016), New Hampshire (2016, 2017), New Jersey (2016, 2017), New Mexico (2016, 2017), New York City (2016, 2017), New York State (2016, 2017), North Carolina (2017), North Dakota (2017), Oklahoma (2016, 2017), Pennsylvania (2016, 2017), Rhode Island (2016, 2017), South Dakota (2017), Texas (2016), Utah (2016, 2017), Vermont (2016, 2017), Virginia (2016, 2017), Washington (2016, 2017), West Virginia (2016, 2017), Wisconsin (2016, 2017), Wyoming (2016, 2017), Puerto Rico (2017). Data sources: Centers for Disease Control and Prevention²⁰ and Shulman et al.²¹

^cParity was missing for 0.2% of observations.

^dSum (0-5; 0 = none, 5 = all) of self-reported preconception obesity, high-risk drinking (>7 drinks per week), a hypertension diagnosis, a diabetes diagnosis, and smoking.

^eIncludes gestational diabetes, hypertensive disorders of pregnancy, and preterm birth.

race/ethnicity or preconception CVD risk and race/ethnicity.

The pattern of results for the association between preconception and pregnancy CVD risk status and CVD-specific counseling (counseling about healthy eating and exercise or

smoking cessation) was similar to that for counseling on all 5 ACOG messages; however, the association between pregnancy-related CVD risk and receiving both CVD-specific messages was weaker than the estimated association for the 5 key messages (aOR = 1.1; 95% CI, 1.1-1.2; Table 3).

Table 3. Association between having a CVD-related pregnancy complication^a and postpartum visit content, Pregnancy Risk Assessment Monitoring System (N = 59 427), 2016-2017^b

Predictor	Content of postpartum visit			
	Received 5 key screenings or messages ^c		Reported 2 CVD-related messages ^d	
	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)
CVD-related pregnancy complication ^a	1.2 (1.1-1.3)	1.2 (1.1-1.3)	1.2 (1.1-1.3)	1.1 (1.1-1.2)
≥1 Prepregnancy CVD risk factor	1.3 (1.2-1.3)	1.2 (1.1-1.2)	1.3 (1.2-1.4)	1.2 (1.1-1.3)
Maternal age, y				
<24	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
24-34	0.6 (0.6-0.6)	0.7 (0.7-0.8)	0.6 (0.6-0.7)	0.8 (0.7-0.8)
≥35	0.4 (0.4-0.5)	0.5 (0.5-0.6)	0.5 (0.5-0.6)	0.6 (0.6-0.7)
Race/ethnicity				
Non-Hispanic White	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Non-Hispanic Black	2.3 (2.1-2.5)	1.9 (1.7-2.1)	2.3 (2.1-2.4)	1.9 (1.7-2.0)
Hispanic	1.9 (1.8-2.1)	1.6 (1.5-1.8)	1.8 (1.7-1.9)	1.5 (1.4-1.6)
Other	1.5 (1.4-1.7)	1.5 (1.4-1.7)	1.4 (1.3-1.5)	1.4 (1.3-1.5)
Health insurance				
Private	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Public	2.1 (2.0-2.3)	1.6 (1.5-1.8)	2.2 (2.0-2.3)	1.7 (1.6-1.8)
None	1.8 (1.7-2.0)	1.4 (1.2-1.5)	1.8 (1.6-1.9)	1.4 (1.3-1.5)

Abbreviations: CVD, cardiovascular disease; OR, odds ratio.

^aIncludes gestational diabetes mellitus, hypertensive disorders of pregnancy, and preterm birth.

^bIncluded sites: Alabama (2017), Alaska (2016, 2017), Arkansas (2016), Colorado (2016, 2017), Connecticut (2016, 2017), Delaware (2016, 2017), Georgia (2017), Hawaii (2016), Illinois (2016, 2017), Iowa (2016, 2017), Kentucky (2017), Louisiana (2016, 2017), Maine (2016, 2017), Maryland (2016, 2017), Massachusetts (2016, 2017), Michigan (2016, 2017), Missouri (2016, 2017), Montana (2017), Nebraska (2016), New Hampshire (2016, 2017), New Jersey (2016, 2017), New Mexico (2016, 2017), New York City (2016, 2017), New York State (2016, 2017), North Carolina (2017), North Dakota (2017), Oklahoma (2016, 2017), Pennsylvania (2016, 2017), Rhode Island (2016, 2017), South Dakota (2017), Texas (2016), Utah (2016, 2017), Vermont (2016, 2017), Virginia (2016, 2017), Washington (2016, 2017), West Virginia (2016, 2017), Wisconsin (2016, 2017), Wyoming (2016, 2017), Puerto Rico (2017). Data sources: Centers for Disease Control and Prevention²⁰ and Shulman et al.²¹

^cThe 5 key messages were depression screening and counseling on smoking, eating and exercise, pregnancy spacing, and birth control methods, adapted from recommendations from the American College of Obstetricians and Gynecologists.¹⁰

^dThe 2 CVD-related messages were counseling on healthy eating and exercise and smoking.

Participants with ≥1 preconception CVD risk factor had 20% higher odds of receiving both CVD-related messages (aOR = 1.2; 95% CI, 1.1-1.3) than participants with no preconception CVD risk factors.

Discussion

Most participants did not report receiving counseling on CVD prevention messages at the postpartum visit. Although participants who experienced a CVD-related pregnancy complication were slightly more likely to report receiving prevention messages and screenings than did participants who did not experience CVD-related pregnancy complications, the strongest predictors of visit content were race/ethnicity, age, and health insurance status. Non-Hispanic White participants were less likely than participants in racial/ethnic minority groups to receive all recommended counseling messages or screenings, whether or not they were at high

CVD risk. These findings suggest that, despite ACOG guidelines to provide CVD risk counseling to participants who have a CVD-related pregnancy complication, visit content may depend more on demographic and socioeconomic factors than on individual risk profiles.

Participants who were younger (aged <24), non-Hispanic Black or Hispanic, or had public health insurance or no insurance were the most likely to report receiving counseling on all postpartum visit content (5 ACOG messages), even after controlling for preconception and pregnancy-related risk factors. The reason for these differences is unclear. One possibility is that health care providers are aware that Hispanic and non-Hispanic Black people are, on average, at higher risk for CVD than non-Hispanic White people and target them for prevention messages (intentionally or subconsciously). However, this pattern was strongest for items such as receipt of an intrauterine device and does not explain the observed trend by age, in which younger people (aged

<24) were more likely to report receiving all content than older people (aged ≥ 24). Alternately, conscious or implicit bias may lead health care providers to decide who should receive what screenings, services, and counseling. The evidence is insufficient to determine health care provider bias in PRAMS. However, this explanation is consistent with previous studies describing discrimination and bias in perinatal care for racial/ethnic minority and publicly insured people.^{16,17,24} Potentially recent (2018) guidance from ACOG on postpartum visit content might help standardize postpartum visit content¹⁰; future research should consider whether racial/ethnic differences in content changed after the guidelines were updated. In addition, further research clarifying how patients perceive the delivery of these messages (ie, as empowering them with information or bullying them into 1 choice) would inform the interpretation of these results. Taking into consideration further sources of variation in postpartum visit content (eg, by hospital, whether people have an established relationship with the physician, a person's own perceived risk) would inform the interpretation of these patterns and possible avenues for intervention.

Previous studies on postpartum visit content focused primarily on diabetes screening and contraceptive counseling and uptake.^{14,25} However, the evidence on overall postpartum visit content is limited. Our results reporting higher levels of information at the postpartum visit among racial/ethnic minority people compared with non-Hispanic White people is similar to results reported in the Listening to Mothers III survey, which reported that non-Hispanic Black people were the most likely (compared with Hispanic or non-Hispanic White people) to say they received "enough information" on healthy eating, birth control, and depression.²⁶ However, the phrasing of this question makes it challenging to compare responses across studies. Finally, postpartum visit attendance was unexpectedly high in PRAMS 2016-2017 compared with previous research.¹⁴

Limitations and Strengths

Our study had several limitations. First, PRAMS data are collected after pregnancy and are self-reported and cross-sectional. Information on postpartum visit content may be underreported or overreported. Variables not available on PRAMS, such as length of time between postpartum visit and survey completion or health literacy, may influence self-report of visit content. However, particularly for counseling, patient self-report may be the best indicator of whether the health care provider engaged the patient in the topic meaningfully during the visit. Second, PRAMS does not ask about all recommended postpartum visit content, and several key facets of the postpartum visit remain unknown. For example, understanding the prevalence of counseling on primary care visits, alcohol use, and prescription medicine would aid in understanding the experience of people at high risk for CVD. Third, we grouped several

racial/ethnic groups into a non-Hispanic "other" category because of sparse data, which limited our ability to make inferences about the experience of Asian or American Indian/Alaska Native people at the postpartum visit. Our data suggest their experience may be similar to non-Hispanic Black or Hispanic people, but further investigation is warranted. Finally, although PRAMS is a representative sample of live births in the 39 included jurisdictions,²⁰ it is not a national sample. Participants may differ from people who do not participate, and that difference is potentially unaccounted for by sampling weights.

This study also had several strengths. First, our results offer a broad view of the postpartum care experience in the United States. Second, PRAMS questionnaires use validated, standardized questions and are available in multiple languages, making it unlikely that people are systematically missed because of language. Finally, the PRAMS questionnaire is administered during the postpartum period, making it likely that participants will accurately remember the content of the postpartum visit.

Conclusion

High-quality, comprehensive care during the postpartum period is an opportunity to keep people engaged with the health care system by connecting them to primary care and, as needed, specialty care. For people who experience a CVD-related complication during pregnancy, postpartum care is an important opportunity for prevention counseling and identification of people at high risk for CVD.²⁷ However, these data suggest that, even for people who attend the postpartum visit, the opportunity for screening and counseling is missed. Health care providers and health care systems should develop innovative strategies to engage patients with care and ensure the quality of that care.

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