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Do Patient Characteristics, Prenatal Care Setting, and Method of Payment Matter When it Comes to Provider-Patient Conversations on Perinatal Mood?

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Abstract To examine factors associated with provider-patient conversations regarding prenatal and postpartum depressed mood. This study included 3,597 White, African American, Hispanic, and Asian/Pacific Islander NYC resident women who completed the Pregnancy Risk Assessment Monitoring System (PRAMS) survey from 2004–2007, a population-based assessment of patient and health care characteristics. Social determinants including race, nativity, maternal age, prenatal health care setting, and payment type were associated with patient report of having had a conversation about perinatal mood with their provider. Compared to Whites, Asian/Pacific Islanders were less likely to have this conversation (OR = 0.7, CI = 0.5–0.9). Older (OR = 0.6, CI = 0.4–0.9), non-US born (OR = 0.6, CI = 0.5–0.8), and women receiving care from a private doctor or HMO clinic (OR = 0.7, CI = 0.6–0.9) were less likely to have this conversation compared to their respective counterparts. Those who paid for their prenatal care primarily through personal income or through an expanded Medicaid program for prenatal care compared to those who did not were more likely to have had a conversation about mood with their providers. Health care providers and public health advocates should be aware that non-US born women were less likely to have conversations about mood than US born women. However, young mothers shown to be at risk for perinatal depression were more likely to have these conversations compared to older women. Protocols for assessing and educating patients about perinatal mood should be evaluated to improve conversation rates for those receiving care through private doctors and managed care organizations. Income and prenatal care assistance funds may play separate and important roles in provider-patient conversations.

Keywords Social determinants · Postpartum depression · Prenatal care · Racial disparities · Health care settings

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Introduction

Perinatal depression has been recognized as a major public health concern with up to 19% of women experiencing depression during pregnancy and/or the postpartum period [1]. Recently, state governments such as New Jersey and Massachusetts have passed legislation to promote early identification of depression during the perinatal period [2, 3]. Addressing perinatal depression has been a major priority for the American College of Obstetricians and Gynecologists [4, 5]. These initiatives are consistent with the goals of the US Preventive Services Task Force [1] to promote the practice of systematic screening of depressed women.

Nonetheless, screenings do not sufficiently guarantee the necessary care; in fact, the efforts to assess perinatal depression in a clinical setting often occur through methods besides questionnaire-based screening protocols [6, 7]. Those who educate patients on perinatal depression tend to be attending/staff obstetricians, nursing staff, and social workers who use a combination of methods including

direct verbal education and pre-printed literature on depressed mood [8]. Obstetrician-gynecologists commonly assess for depression through observation and inquiry with the patient rather than through screening tools [9] and almost one-half of nurses reported providing regular counseling to women with symptoms of postpartum depression [10].

While systematic screening tools cast a wider net in the assessment for perinatal mood at a lower cost, provider-patient conversations about mood serve a critical purpose towards patient care. For instance, a recent analysis revealed that women who reported having had a discussion on mood with a provider were more likely to receive a postpartum depression diagnosis. This was especially true for Asian/Pacific Islanders (A/PI), even though only 38.6% of A/PI reported having a discussion about mood with their providers, compared to 54.0% of Whites, 57.3% of Hispanics, and 60.7% of African Americans [11]. Provider-patient conversations may be an important strategy for addressing the racial/ethnic disparities in the diagnosis of perinatal depression.

Despite these implications, the social determinants of provider-patient conversations remain unknown. There are a few ways in which social and economic conditions are implicated in health care equality or inequality of perinatal depression, by way of provider-patient conversations. To attain health care *equality*, providers, even with the limited time they have with patients, might direct conversation about mood with patients believed to be most at risk for perinatal mood problems. There is some data in the literature suggesting the factors that might lead to these conversations. For instance, providers believe that the amount of postpartum depression education should vary by patient characteristics, specifically, that first-time mothers, and women with signs of depression and more risk factors ought to receive more postpartum depression education [8]. Other findings related to postpartum depression risk might influence providers to emphasize postpartum depression concerns with underserved groups. For example, ethnic minorities, including Blacks, Hispanics, and Asians, those with lower education and income, and those non-native to the US, experience higher rates of postpartum depression [12–15].

However, the unfortunate reality is that these same factors are generally the social determinants of health care *inequality,* given the lack of resources available to those with a lower socioeconomic status [16]. Moreover, these inequalities in provider-patient conversations are likely maintained through experiences specific to the health care setting and the payment used to obtain prenatal care. Women receive prenatal care from a variety of different health care settings, from hospital-based settings to community health clinics, and the type of prenatal care setting may have some effect on the assessment and treatment of perinatal mood problems. For example, public funded hospital and community clinics often offer more maternal and child health services compared to services received from private doctors or managed care, which occur mostly through one-on-one consultation [17, 18]. Obstetrician-gynecologists are also more likely to make referrals regarding depression if a mental health provider is available at their site [9]. The method of payment for prenatal care, whether it is insurance or Medicaid may also have an impact on the care received, in addition to the health care setting. In one study, women perceived to have been treated differently by health care providers due to insurance status were less likely to receive support for certain prenatal topics [19]. The studies on perinatal mood are generally limited to a focus on screening, rather than on provider-patient communication, and do not account for differences in clinical practices across social determinants such as patient characteristics, health care settings, and payment type.

The objective of this current study was to identify social determinants of provider-patient conversations on depressed mood during the perinatal period, and particularly patient and health care characteristics. There are major implications for doing this. First, communications by a provider may have an effect on health outcomes. Provider preparedness with dispensing information on postpartum emotional problems strongly predicts patient satisfaction with the provider; patients who are most satisfied are more likely to attend follow-up postpartum appointments [20]. Second, the patient characteristics associated with provider-patient conversations about mood might vary by culture, which would highlight subgroups of women systematically overlooked in the assessment for depressed mood. Determining differences in provider-patient conversations across groups would allow us to hone in on specific health disparities in the assessment of perinatal mood, not only in terms of race/ethnicity and other sociodemographic factors, but at a broader level of health care. This study provides a basis for furthering our understanding on how patient characteristics, health care settings, and payment methods might have an impact at the level of provider-patient conversation on perinatal mood.

Methods

This study used the New York City (NYC) Pregnancy Risk Assessment Monitoring System (PRAMS) data from 2004–2007, an ongoing population-based survey administered to postpartum women from the five boroughs of NYC. The goal of PRAMS is to monitor maternal behaviors and experiences of women before, during, and after pregnancies that result in live births. The NYC Department

of Health and Mental Hygiene provided the dataset used for this study.

Participants

NYC mothers of approximately 180 infants with registered birth certificates who gave birth during the previous 2–4 months were contacted for participation in the PRAMS each month. Surveys were mailed to mothers and non-responders to the mailings were contacted by telephone. Eighty-three percent responded by mail and 17% by phone. The sample was randomized without replacement and stratified by birth weight. The final dataset was weighted for stratification, nonselection, and nonresponse.

According to the NYC Department of Health and Mental Hygiene, a total of 4,813 responses were received with response rates of at least 70% from July to December of 2004, May to December of 2005, and January to December of 2006. A rate of 65% was achieved from January to December of 2007. For 2004–2005, responses were weighted to represent 138,266 live births. For 2006 and 2007, responses represented 119,079 and 122,222 live births, respectively.

Measures

The birth certificate provided information on maternal race/ethnicity and nativity (i.e., US or non-US born mothers). Women were classified as Hispanic or non-Hispanic based on self-report. Non-Hispanic women were categorized in one of the following groups: White, African American, Asian/Pacific Islander (A/PI), and American Indian/Alaskan Native. Maternal age used in the analyses was based at the time of the infants' birth and calculated from information provided in the birth certificate. Maternal level of education was also obtained from the birth certificate and categorized as: 0–8, 9–11, 12, 13–15, and >16 years. Mean infant age at the time of survey completion was calculated to be 3.9 months; there were no significant differences in infant age across groups.

The PRAMS survey provided information for the other variables. Women were asked to indicate "total household income before taxes in the 12 months before the new baby was born" by checking off one of the following options: <$10,000, $10,000–$14,999, $15,000–$19,999, $20,000–$24,999, $25,000–$34,999, $35,000–$49,999, $50,000–$74,999, and >$75,000. To determine where women obtained prenatal health care, women were asked "Where did you go *most of the time* for your prenatal visits?" and were given the following options: hospital clinic, private doctor's office or HMO (health maintenance organization) clinic, neighborhood clinic or community-based clinic, or other. Types of prenatal care payment were assessed by asking women to check off all of the following options that applied to them: Medicaid, personal income (cash, check, or credit card), health insurance or HMO (including insurance from your work or your husband's/partner's work), PCAP (Prenatal Care Assistance Program), "I still owe," or other. An expanded Medicaid program, PCAP provides prenatal care services for low-income uninsured and underinsured women in NYC. There are no differences in services received by women in Medicaid and those in PCAP; women who enroll in PCAP are those who were not on Medicaid prior to their pregnancy.

Finally, mothers were asked to respond "yes" or "no" regarding Conversation about Mood ("At any time during your most recent pregnancy or after delivery, did a doctor, nurse, or other health care worker talk with you about "baby blues" or postpartum depression?").

Variables with less than a 100% item response included Household Income (86.9%), Maternal Education (99.3%), Maternal Age (97.0%), Prenatal Health Care Settings (96.3%), Use of Medicaid (98.6%), Income (98.6%), Prenatal Care Assistance Program (98.0%) and Still Owe (98.3%). Individual responses with missing variables of interest for this study were eliminated resulting in an unweighted study sample of 3,597.

Statistical Analyses

To account for the stratified and weighted sample, the data were analyzed using the Complex Samples module of SPSS version 17.0 (SPSS Inc., Chicago, IL). Infant Age at the time the mother completed the questionnaire was set as a covariate for all the analyses. Patient characteristics included Maternal Age, Maternal Education, Household Income, and Maternal Nativity. Health care characteristics included Prenatal Care Setting and Type of Payment for Prenatal Care. The occurrence of a Conversation about Mood served as the outcome measure.

Our analytic strategy included descriptive analyses to determine the prevalence of the proposed predictors (patient and health care characteristics) and the outcome (occurrence of a Conversation about Mood). These prevalence estimates were determined by race/ethnicity given our interest in understanding potential disparities by group. We then conducted a logistic regression to determine the likelihood of having had a conversation about mood for each ethnic group with Whites as the reference group. In order to compare the characteristics of those who did and did not have a conversation within each group, race-stratified logistic regressions incorporated all predictors into the models that produced odds ratios adjusted for all the other predictors in the model. All reported proportions represent weighted averages.

Results

The distributions of patient characteristics are displayed in Table 1. It is notable that half of the women reported having had a conversation about mood except A/PI, of which only 39.8% reported having had this conversation. With regards to the health care setting and payment types used, most women received care through a hospital clinic or private doctor/HMO. Most Hispanic women were seen at a hospital clinic (61.3%) whereas most Whites (84.0%) and A/PI (56.1%) were seen by a private doctor/HMO. The majority of Black women received care from either the hospital clinic (46.6%) or private doctor (39.0%). Compared to other groups, a greater percentage of Black women (12.3%) reported receiving care from other settings (12.3%). The most common payment sources for all women were Medicaid and Insurance/HMO, with most Hispanics using Medicaid (67.5%) and most Whites using insurance/HMO (75.5%). A solid percentage of Whites paid through income (14.6%), followed by A/PI (9.1%), Hispanics (4.5%), and Blacks (3.4%). Blacks utilized the Prenatal Care Assistance Program the most (14.0%), followed by Hispanics (12.7%), A/PI (5.0%), and Whites (4.2%).

Based on Tables 2 and 3, women who gave birth after the age of 20 years were less likely than those under the age of 20 years to have had a conversation about mood (Age 20–34 years: OR = 0.7, CI = 0.5–1.1; Age ≥35 years: OR = 0.6, CI = 0.4–0.9), with 70% of women under the age of 20 years having this conversation, compared to 55.6% of 20–34 year olds and 48.7% of women over the age of 35 years. Neither maternal education nor household income determined the likelihood of having had this conversation. Non-US born women were significantly less likely to have had a conversation (OR = 0.6, CI = 0.5–0.8). Of the women born in the US, 60.7% had a conversation compared to 49.9% of women not born in the US. However, nativity did not distinguish the A/PI who did or did not have a conversation about mood with their providers. Approximately 40% of both US and non-US born A/PI had a conversation about mood.

The health care setting and payment types for prenatal care were both associated with having had a conversation about mood. For all women, a statistical trend was observed for a decreased likelihood of having a conversation when care was provided through a private doctor/HMO compared to a hospital or neighborhood clinic (OR = 0.7, CI = 0.6–0.9). Whereas the majority among those who received care from a neighborhood clinic (62.8%) and those from a hospital clinic (58.4%) reported having had a conversation, approximately half among those who received care from a private doctor/HMO (51.0%) had this conversation. Those who paid primarily by income ("out-of-pocket") (OR = 1.6, CI = 1.2–2.2) and who received prenatal care assistance (OR = 1.4, CI = 1.0–1.9) were more likely to have had a conversation with their provider than those who did not primarily use these forms of payment. Among those who paid using income and through PCAP, 62.4% and 64.5%, respectively, had a conversation with their providers about mood compared to 57.3% of those using Medicaid and 52.8% of those with insurance/HMO. Within race/ethnicity, the use of income for payment increased the likelihood for A/PI (OR = 3.0, CI = 1.1–7.9), with 66.5% of Asians who paid with income reporting having a conversation. The PCAP significantly increased the likelihood for conversations about mood among Hispanics (OR = 2.5, CI = 1.4–4.3), while a statistical trend was noted in the decreased likelihood for A/PI (OR = 0.3, CI = 0.1–1.2). Among Hispanic and A/PI women who received prenatal care assistance, 75.6 and 84.9%, respectively, had a conversation about mood.

Discussion

Our study demonstrated that social determinants involving patient characteristics may have significant impact on the likelihood of provider conversations on perinatal mood. Our analyses suggest that the proposed determinants may be associated with provider efforts to address existing inequalities by targeting particular groups believed to be at greater risk for perinatal mood problems. Although maternal education and income did not distinguish those who did and did not have a conversation about mood, we found that mothers who were younger than 20 years of age were more likely to have had this conversation compared to older mothers. This finding is consistent with research showing that young mothers tend to experience greater psychosocial stress and depression [21, 22] and may reflect provider understanding that younger mothers require more postpartum depression education [8]. We also found that Blacks and Hispanics were as likely as Whites to report having a conversation about mood, and within Hispanics, those who were low-income were more likely to have had a conversation. The higher likelihood to have a conversation with low-income Hispanics is in line with data showing this group to be at risk for perinatal depression [23], though it contrasts with other findings indicating Hispanic women to be at lower risk [13, 24]. Overall, these findings seem to suggest that providers are directing conversations about mood to women they believe are at risk for postpartum depression. It may be that their actions are based on clinical observations and experiences. It is also possible that ongoing postpartum research and public health initiatives have influenced provider decisions to address depression with their patients.

Table 1 Weighted percentage of mothers who completed the NYC PRAMS from 2004 to 2007 by reported conversation about mood with provider, sociodemographic characteristics, according to race/ethnicity

	Total (n = 3,597)		White (n = 1,023)		Asian/Pacific Islander (n = 399)		Hispanic (n = 1,204)		Black (n = 971)	
	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI
Maternal age										
<20	5.7	4.8, 6.8	2.2	1.3, 3.8	0.9	0.2, 5.2	9.7	7.8, 12.0	7.0	5.0, 9.8
20–34	73.7	71.9, 75.5	70.3	66.9, 73.5	75.0	69.3, 79.9	77.0	74.0, 79.8	73.2	69.3, 76.8
≥35	20.6	19.0, 22.2	27.5	24.4, 30.8	24.1	19.3, 29.6	13.3	11.2, 15.8	19.7	16.7, 23.2
Maternal education										
0–8	5.0	4.2, 6.1	1.6	0.8, 3.2	2.2	0.9, 5.5	11.4	9.3, 13.8	1.5	0.7, 3.0
9–11	13.0	11.5, 14.5	4.2	2.7, 6.4	11.2	7.3, 16.8	20.1	17.4, 23.1	15.8	12.7, 19.5
12	28.6	26.7, 30.5	22.6	19.5, 26.1	26.6	21.2, 32.8	33.8	30.6, 37.1	30.3	26.5, 34.5
13–15	20.6	19.0, 22.2	16.3	13.8, 19.1	13.7	10.1, 18.3	21.3	18.6, 24.3	29.0	25.3, 32.9
≥16	32.9	31.0, 34.8	55.3	51.5, 58.9	46.3	40.2, 52.5	13.4	11.3, 15.9	23.4	20.1, 27.1
Income										
<10,000	25.6	23.9, 27.5	9.9	7.8, 12.6	20.4	15.6, 26.3	40.1	36.7, 43.5	28.9	25.0, 33.0
10,000–14,999	11.0	9.7, 12.4	6.7	4.9, 9.0	16.2	11.9, 21.8	14.3	12.0, 16.9	9.6	7.4, 12.5
15,000–19,999	7.2	6.2, 8.4	4.7	3.3, 6.6	8.0	5.1, 12.4	8.4	6.7, 10.6	8.6	6.4, 11.5
20,000–24,999	6.4	5.4, 7.4	4.7	3.3, 6.6	5.1	3.0, 8.6	6.8	5.2, 8.7	8.8	6.6, 11.6
25,000–34,999	9.0	7.9, 10.2	6.8	5.1, 9.0	4.8	2.9, 7.9	9.6	7.8, 11.8	13.3	10.7, 16.5
35,000–49,999	8.3	7.2, 9.4	8.8	6.9, 11.1	6.0	3.7, 9.6	6.9	5.4, 8.9	10.6	8.3, 13.5
50,000–74,999	9.5	8.3, 10.7	12.1	9.9, 14.7	9.3	6.4, 13.2	6.3	4.8, 8.2	10.5	8.2, 13.3
≥75,000	23.1	21.5, 24.8	46.3	42.7, 50.0	30.2	24.9, 36.0	7.6	6.0, 9.6	9.7	7.5, 12.5
Maternal nativity										
US born	53.2	51.2, 55.3	67.3	63.7, 70.7	10.6	7.5, 14.8	33.0	29.8, 36.4	56.8	52.5, 61.0
Non-US born	46.8	44.7, 48.8	32.7	29.3, 36.3	89.4	85.2, 92.5	67.0	63.6, 70.2	43.2	39.0, 47.5
Prenatal care setting										
Hospital clinic	39.1	37.2, 41.3	10.9	8.7, 13.6	38.4	32.3, 44.8	61.3	57.9, 64.6	46.6	42.3, 50.9
Private doctor/HMO	51.4	49.3, 53.4	84.0	81.0, 86.6	56.1	49.7, 62.3	27.1	24.1, 30.2	39.0	34.9, 43.2
Neighborhood clinic	2.0	1.5, 2.7	2.2	1.4, 3.6	1.5	0.5, 4.4	1.9	1.2, 3.1	2.1	1.2, 3.8
Other	7.4	6.4, 8.6	2.8	1.7, 4.5	4.1	2.2, 7.4	9.7	7.8, 12.0	12.3	9.8, 15.4
Payment type										
Medicaid	46.7	44.7, 48.8	23.0	19.9, 26.5	42.8	36.6, 49.2	67.5	64.2, 70.6	51.3	47.0, 55.6
Income	8.0	7.0, 9.2	14.6	12.2, 17.3	9.1	6.2, 13.2	4.5	3.3, 6.2	3.4	2.2, 5.3
Insurance/HMO	51.9	49.8, 53.9	75.5	72.0, 78.7	53.8	47.4, 60.0	31.9	28.8, 35.2	47.2	42.9, 51.5
Prenatal care assistance program	9.4	8.2, 10.7	4.2	2.9, 6.1	5.0	2.7, 9.1	12.7	10.6, 15.3	14.0	11.1, 17.4
Still owe	3.7	2.9, 4.5	2.2	1.3, 3.6	0.5	0.1, 3.0	4.7	3.4, 6.4	5.8	4.1, 8.3

On the other hand the findings indicate that provider decisions are not always well targeted. We found that non-US born women were less likely to have a conversation about mood (49.9%) compared to US born (60.7%), with the exception of A/PI. This is particularly disconcerting given that women who recently immigrated to the US are five times more likely to exhibit depressive symptoms than non-immigrant mothers [25], and tend to be more socially isolated during the postpartum period [26]. It is possible that providers were less likely to have conversations about mood with non-US born women because providers deem them to be at less risk for depression. However, nativity is more likely to be a social determinant for the inequalities observed in provider-patient conversations and cultural differences in clinical presentation may explain why non-US born women are less likely to have had this conversation with their providers. For obstetrics-gynecology residents, the most common cue for postpartum depression was when the patient introduced the topic, followed by the patient appearing depressed [9]. However, non-US born women, even those with a good comprehension of English, may be less likely to introduce the topic of depression

Table 2 Weighted percentage of mothers by characteristic according to reported provider-patient conversation about mood by race/ethnicity

	Total				White				Asian/Pacific Islander			
	No		Yes		No		Yes		No		Yes	
	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI
Race	45.0	43.0, 47.1	55.0	52.9, 57.0	45.8	42.2, 49.5	54.2	50.5, 57.8	60.2	54.0, 66.1	39.8	33.9, 46.0
Maternal age												
<20	30.0	22.5, 38.7	70.0	61.3, 77.5	21.1	7.1, 48.5	78.9	51.5, 92.9	5.5	0.4, 46.5	94.5	53.5, 99.6
20–34	44.4	42.0, 46.8	55.6	53.2, 58.0	45.5	41.1, 50.0	54.5	50.0, 58.9	60.2	52.9, 67.2	39.8	32.8, 47.1
≥35	51.3	47.0, 55.6	48.7	44.4, 53.0	48.7	42.0, 55.3	51.3	44.7, 58.0	58.7	47.0, 69.8	41.3	30.2, 53.0
Maternal education												
0–8	42.0	33.1, 51.5	58.0	48.5, 66.9	36.8	12.6, 70.2	63.2	29.8, 87.4	48.2	12.5, 85.9	51.8	14.1, 87.5
9–11	36.1	30.4, 42.3	63.9	57.7, 69.6	52.1	31.3, 72.2	47.9	27.8, 68.7	68.6	45.5, 85.1	31.4	14.9, 54.5
12	45.1	41.2, 49.1	54.9	50.9, 58.8	48.7	40.2, 57.2	51.3	42.8, 59.8	52.1	39.4, 64.8	47.9	35.2, 60.6
13–15	45.0	40.7, 49.4	55.0	50.6, 59.3	48.3	39.7, 57.1	51.7	42.9, 60.3	63.5	47.5, 77.0	36.5	23.0, 52.5
≥16	48.9	45.5, 52.3	51.1	47.7, 54.5	43.7	39.2, 48.4	56.3	51.6, 60.8	62.4	53.9, 70.2	37.6	29.8, 46.1
Income												
<10,000	41.7	37.6, 45.8	58.3	54.2, 62.4	40.6	28.8, 53.5	59.4	46.5, 71.2	69.4	54.5, 81.1	30.6	18.9, 45.5
10,000–14,999	44.6	38.4, 50.9	55.4	49.1, 61.6	48.5	33.5, 63.8	51.5	36.2, 66.5	60.4	43.6, 75.4	39.6	24.6, 56.4
15,000–19,999	44.3	36.7, 52.1	55.7	47.9, 63.3	49.7	32.7, 66.7	50.3	33.3, 67.3	49.6	27.8, 71.6	50.4	28.4, 72.2
20,000–24,999	45.0	37.1, 53.3	55.0	46.7, 62.9	63.3	45.1, 78.4	36.7	21.6, 54.9	51.4	26.1, 76.0	48.6	24.0, 73.9
25,000–34,999	47.5	40.8, 54.2	52.5	45.8, 59.2	58.8	44.0, 72.1	41.2	27.9, 56.0	49.9	26.2, 73.6	50.1	26.4, 73.8
35,000–49,999	44.3	37.5, 51.3	55.7	48.7, 62.5	42.8	31.3, 55.2	57.2	44.8, 68.7	58.9	35.4, 78.9	41.1	21.1, 64.6
50,000–74,999	48.2	41.7, 54.8	51.8	45.2, 58.3	39.9	30.1, 50.6	60.1	49.4, 69.9	66.3	47.2, 81.3	33.7	18.7, 52.8
≥75,000	47.2	43.1, 51.3	52.8	48.7, 56.9	44.7	39.7, 49.7	55.3	50.3, 60.3	58.1	47.4, 68.2	41.9	31.8, 52.6
Maternal nativity												
US born	39.3	36.4, 42.3	60.7	57.7, 63.6	42.6	38.2, 52.9	57.4	52.9, 61.8	59.5	41.5, 75.2	40.5	24.8, 58.5
Non-US born	50.1	47.3, 52.9	49.9	47.1, 52.7	52.5	46.1, 58.9	47.5	41.1, 53.9	60.3	53.7, 66.6	39.7	33.4, 46.3
Prenatal care setting												
Hospital clinic	41.6	38.4, 44.9	58.4	55.1, 61.6	41.4	30.4, 53.3	58.6	46.7, 69.6	59.4	48.8, 69.3	40.6	30.7, 51.2
Private doctor/HMO	49.0	46.2, 51.9	51.0	48.1, 53.8	46.6	42.7, 50.6	53.4	49.4, 57.3	61.0	52.9, 68.6	39.0	31.4, 47.1
Neighborhood clinic	37.2	25.0, 51.2	62.8	48.8, 75.0	49.1	27.3, 71.2	50.9	28.8, 72.7	54.4	10.8, 92.2	45.6	7.8, 89.2
Other	37.3	30.4, 44.7	62.7	55.3, 69.6	36.4	17.6, 60.6	63.6	39.4, 82.4	58.6	28.9, 83.2	41.4	16.8, 71.1
Payment type												
Medicaid	42.7	39.7, 45.7	57.3	54.3, 60.3	47.0	38.9, 55.3	53.0	44.7, 61.1	58.2	48.0, 67.8	41.8	32.2, 52.0
Income	37.6	31.1, 44.6	62.4	55.4, 68.9	40.9	32.2, 50.3	59.1	49.7, 67.8	33.5	18.6, 52.6	66.5	47.4, 81.4
Insurance/HMO	47.2	44.4, 50.0	52.8	50.0, 55.6	44.9	40.9, 49.1	55.1	50.9, 59.1	61.7	53.7, 69.2	38.3	30.8, 46.3
Prenatal care assistance program	35.5	29.2, 42.5	64.5	57.5, 70.8	42.8	25.6, 61.9	57.2	38.1, 74.4	15.1	2.8, 52.3	84.9	47.7, 97.2
Still owe	37.3	27.7, 48.1	62.7	51.9, 72.3	55.0	30.4, 77.4	45.0	22.6, 69.6	6.5	0.5, 50.7	93.5	49.3, 99.5

	Hispanic				Black			
	No		Yes		No		Yes	
	OR	CI	OR	CI	OR	CI	OR	CI
Race	42.8	39.4, 46.3	57.2	53.7, 60.6	39.4	35.3–43.6	60.6	56.4, 64.7
Maternal age								
<20	31.2	21.9, 42.5	68.8	57.5, 78.1	27.1	14.8, 44.3	72.9	55.7, 84.2
20–34	42.9	39.0, 46.8	57.1	53.2, 61.0	37.1	32.4, 42.1	62.9	57.9, 67.6
≥35	51.0	42.0, 60.0	49.0	40.0, 58.0	52.1	43.0, 61.1	47.9	38.9, 57.0

Table 2 continued

	Hispanic				Black			
	No		Yes		No		Yes	
	OR	CI	OR	CI	OR	CI	OR	CI
Maternal education								
0–8	39.6	30.0, 50.1	60.4	49.9, 70.0	72.7	38.4, 91.9	27.3	8.1, 61.6
9–11	30.9	24.1, 38.6	69.1	61.4, 75.9	28.2	18.8, 40.0	71.8	60.0, 81.2
12	43.6	37.7, 49.6	56.4	50.4, 62.3	40.6	33.1, 48.5	59.4	51.5, 66.9
13–15	45.9	38.6, 53.3	54.1	46.7, 61.4	37.1	30.0, 44.7	62.9	55.3, 70.0
≥16	56.8	47.5, 65.6	43.2	34.4, 52.5	46.1	37.8, 54.6	53.9	45.4, 62.2
Income								
<10,000	41.2	36.1, 47.0	58.8	53.0, 63.9	32.7	25.5, 40.7	67.3	59.3, 74.5
10,000–14,999	40.6	32.1, 49.7	59.4	50.3, 67.9	35.6	23.9, 49.3	64.4	50.7, 76.1
15,000–19,999	45.8	34.2, 57.9	54.2	34.2, 57.9	35.4	22.6, 50.7	64.6	49.3, 77.4
20,000–24,999	38.0	26.4, 51.2	62.0	48.8, 73.6	37.5	24.7, 52.4	62.5	47.6, 75.3
25,000–34,999	39.9	29.8, 50.9	60.1	49.1, 70.2	47.0	35.7, 58.5	53.0	41.5, 64.3
35,000–49,999	46.0	33.5, 58.9	54.0	41.1, 66.5	40.1	28.6, 52.8	59.9	47.2, 71.4
50,000–74,999	51.1	37.8, 64.4	48.9	35.6, 62.2	51.0	38.4, 63.5	49.0	36.5, 61.6
≥75,000	49.3	37.2, 61.6	50.7	38.4, 62.8	44.6	31.9, 58.1	55.4	41.9, 68.1
Maternal nativity								
US born	38.5	32.8, 44.6	61.5	55.4, 67.2	32.5	27.4, 38.0	67.5	62.0, 72.6
Non-US born	44.9	40.8, 49.2	55.1	50.8, 59.2	48.4	42.0, 54.9	51.6	45.1, 58.0
Prenatal care setting								
Hospital clinic	40.2	35.9, 44.6	59.8	55.4, 64.1	37.1	31.2, 43.4	62.9	56.6, 68.8
Private doctor/HMO	51.4	44.8, 57.9	48.6	42.1, 55.2	45.1	38.6, 51.9	54.9	8.8, 53.0
Neighborhood Clinic	28.4	12.2, 53.1	71.6	46.9, 87.8	24.8	8.8, 53.0	75.2	47.0, 91.2
Other	38.6	28.5, 49.8	61.4	50.2, 71.5	32.4	22.4, 44.3	67.6	55.7, 77.6
Payment type								
Medicaid	42.0	37.8, 46.2	58.0	53.8, 62.2	34.6	29.1, 40.6	65.4	59.4, 70.9
Income	34.6	21.1, 51.2	65.4	48.8, 78.9	28.7	14.1, 49.7	71.3	50.3, 85.9
Insurance/HMO	46.2	40.3, 52.2	53.8	47.8, 59.7	44.8	38.8, 50.9	55.2	49.1, 61.2
Prenatal care assistance program	24.4	17.0, 33.8	75.6	66.2, 83.0	38.4	27.5, 50.6	61.6	49.4, 72.5
Still owe	32.7	19.7, 49.2	67.3	50.8, 80.3	34.9	20.6, 52.5	65.1	47.5, 79.4

given its stigma [27]. Furthermore, their clinical presentation for depression may differ from US born women. Many immigrant groups present primarily with psychosomatic symptoms rather than psychological symptoms of perinatal depression [28–30]. The display rules within certain cultures may dictate that patients appear normal in the presence of the provider [31, 32]. Language difficulties for non-US born women may explain the decreased likelihood for having a discussion about mood, and obtaining an interpreter to follow up on specific questions about mood and other psychosocial issues may be a lower priority relative to other medical concerns that take place within a prenatal care appointment [33].

Unlike the other groups, nativity did not distinguish A/PI who did and did not have a conversation. Certainly, non-US born A/PI also experience language and cultural barriers with their providers. What might account for US born women being less likely to have a conversation compared to other US born groups? Though unsupported by research, this finding may represent an assumption by providers that depression levels among A/PI do not vary by acculturation as is the case for the other groups. Along with the low percentage of A/PI who reported having a conversation, one explanation is that A/PI, regardless of nativity are thought to be less depressed, with the tendency among Asian American patients to disclose fewer complaints about depression, but more somatic experiences leading to this perception [28, 34]. This perception may also be driven by providers who might maintain the belief that Asian Americans are model minorities, who are successful and are not as likely to experience psychological distress [35, 36]. The low rate of conversation about mood

Table 3 Logistic regression showing adjusted odds of conversation about mood per predictor by total and by race/ethnic group

	Total		White		Asian/Pacific Islander		Hispanic		Black	
	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI
Race/ethnicity										
White	1.0	–								
Asian/Pacific Islander	0.7**	0.5–0.9								
Hispanic	1.0	0.8–1.3								
Black	1.2	0.9–1.5								
Maternal age										
<20	1.0	–	1.0	–	1.0	–	1.0	–	1.0	–
20–34	0.7*	0.5–1.1	0.4	0.1–1.7	11.0	0.6–201.2	0.8	0.4–1.3	0.7	0.3–1.7
≥35	0.6*	0.4–0.9	0.2	0.1–1.4	10.3	0.5–192.3	0.6	0.3–1.2	0.5	0.2–1.3
Maternal education										
0–8	1.0	–	1.0	–	1.0	–	1.0	–	1.0	–
9–11	0.8	0.5–1.2	0.4	0.1–2.1	0.7	0.1–5.5	1.1*	0.6–2.0	4.5	0.9–22.8
12	0.8	0.5–1.3	0.6	0.1–2.6	0.8	0.1–5.2	0.7**	0.4–1.2	3.3	0.7–15.6
13–15	0.7	0.4–1.2	0.6	0.1–2.8	0.5	0.1–3.3	0.6†	0.3–1.1	4.6	1.0–21.8
≥16			0.7	0.2–3.3	0.5	0.1–3.2	0.4	0.2–0.8	3.5	0.7–17.4
Income										
<10,000	1.0	–	1.0	–	1.0	–	1.0	–	1.0	–
10,000–14,999	1.0	0.7–1.4	0.8	0.3–1.8	1.5*	0.6–3.9	1.0	0.6–1.6	1.1	0.5–2.1
15,000, 19,999	1.1	0.7–1.6	0.8	0.3–2.0	2.7	0.7–10.1	0.9	0.5–1.5	1.1	0.5–2.3
20,000–24,999	0.9	0.6–1.4	0.4	0.2–1.0	2.3	0.6–8.7	1.2	0.7–2.3	0.8	0.4–1.6
25,000–34,999	0.9	0.6–1.3	0.5	0.2–1.3	3.3	0.8–12.9	1.2	0.7–2.2	0.6	0.3–1.1
35,000–49,999	1.1	0.7–1.6	1.0	0.5–2.4	2.1	0.5–9.3	1.1	0.6–2.0	0.9	0.5–2.0
50–74,999	1.1	0.7–1.6	1.2	0.5–2.9	2.4	0.6–9.4	1.0	0.5–2.1	0.6	0.3–1.3
≥75,000	1.2	0.8–1.8	0.9	0.4–2.1	3.9	1.0–14.8	1.3	0.6–2.8	0.9	0.4–2.0
Maternal nativity										
US born	1.0	–	1.0	–	1.0	–	1.0	–	1.0	–
Non-US born	0.6***	0.5–0.8	0.6**	0.5–0.9	1.0	0.4–2.3	0.7†	0.5–1.1	0.6**	0.4–0.8
Prenatal care setting										
Hospital clinic	1.0	–	1.0	–	1.0	–	1.0	–	1.0	–
Private doctor/HMO	0.7†	0.6–0.9	0.7	0.4–1.2	0.7	0.3–1.6	0.7	0.4–1.0	0.8	0.5–1.2
Neighborhood clinic	1.0	0.6–1.9	0.5	0.2–1.5	2.3	0.1–62.3	1.7	0.6–4.9	1.2	0.4–3.8
Payment type										
Medicaid	1.1	0.8–1.6	1.5	0.7–3.4	1.3	0.4–4.7	1.0	0.6–1.8	0.9	0.5–1.6
Income	1.6**	1.2–2.2	1.3	0.8–2.0	3.0*	1.1–7.9	1.6	0.8–3.4	1.8	0.7–4.9
Insurance/HMO	1.1	0.8–1.5	1.4	0.7–2.9	0.7	0.2–2.3	1.3	0.8–2.2	0.8	0.4–1.4
Prenatal care assistance program	1.4†	1.0–1.9	1.1	0.5–3.0	0.3†	0.1–1.2	2.5**	1.4–4.3	0.8	0.5–1.5
Still owe	1.2	0.7–1.9	0.9	0.3–2.5	6.5	0.5–90.2	1.5	0.7–3.0	1.0	0.4–2.2

Reference for all payment is those who did not endorse "yes" to using the source of payment

† $P < 0.1$; * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

with A/PI is of major concern, given the high depression and suicide rates among young Asian American women [37, 38].

In our evaluation of health care characteristics as social determinants, we found that those who received care from a private doctor or HMO were somewhat less likely to have a conversation than those who received care from a hospital or community setting, even when controlling for patient characteristics and type of prenatal care payment. Although a statistical trend, these findings require researchers and policy makers to think about the procedures for perinatal depression assessment and education across settings. Public funded settings such as hospital and community clinics may be more interdisciplinary, with

greater access to on-site mental health and group-based prenatal services compared to private doctors or managed care. These additional services at hospital and community clinics may raise greater awareness for psychosocial issues and thus facilitate conversations about depressed mood with providers [17, 18, 33]. Relatedly, the lower likelihood for having a conversation about mood within private clinics or HMO settings may be due to an implicit assumption that those who receive care from these settings are those who have private insurance, who are not at risk for depression. Such assumptions may then inadvertently engender a health care culture less attentive to depressed mood relative to hospitals and community clinics where depressed mood may be more prevalent among patients. Finally, and notwithstanding, it is important to note that a substantial number of women across groups did not have a conversation about mood in each of these health care settings, demonstrating a lack of provider-patient conversations regardless of the setting.

The type of prenatal care payment also appeared to predict provider conversation on mood, regardless of the prenatal health care setting. The increase in the likelihood due to use of personal income was found specifically for A/PI. Although a small percentage use personal income to pay for prenatal care payment across groups, the circumstances for its use should be considered. Those who pay "out-of-pocket" may not have insurance; those who do have insurance may not have prenatal care coverage. There may be cultural reasons for paying with personal income. Asian groups, especially those from cash based societies may be more accustomed to paying for services with cash [39, 40]; the A/PI in our sample might have adopted this method for prenatal care. However, it remains unclear why Asians who pay with income are more likely to have had a conversation about mood.

Women who took part in PCAP were somewhat more likely to have had a conversation about mood with providers, and Hispanic women were 2.5 times more likely to have had this conversation if they took part in PCAP. With 12.7% of Hispanic women having received services because of PCAP, Hispanic receipt of services through PCAP may have a major impact for promoting provider conversations about perinatal mood; compared to Whites, Hispanic, and Black women are less likely to receive early prenatal care, if at all [41]. It is unclear how PCAP participation may play a role in these conversations since women in PCAP do not receive different prenatal services than pregnant women already on Medicaid. The women who were not eligible for Medicaid but who chose to enroll in PCAP may be a self-selected group that have greater prenatal concerns to be addressed. It is also possible that the process of enrolling in PCAP facilitates the obtaining of prenatal services. These reasons do not explain why a greater likelihood for conversation about mood took place specifically with Hispanic women enrolled in PCAP. However, the PCAP presumptive eligibility requirement in place at the time at which these data were collected allowed uninsured pregnant women to obtain immediate prenatal care while their eligibility was being processed. Thus, undocumented Hispanic women may have been able to receive care during the processing period which could have taken up to a couple of months [42]. Although speculative, recent increases for PCAP presumptive eligibility might have positive effects at the level of provider-patient conversations on mood.

The study limitations should be noted when interpreting these results. We were limited to the identification of associations between the proposed risk factors and conversations about mood variable. Although we propose causal mechanisms (e.g., how risk factors might lead to conversations), causality cannot be established with these data. In addition, women were asked about conversations with providers from the past year, and with any self-report, there may be inaccuracies regarding the report of such events. We also did not have information on the frequency or the nature of these conversations. It is possible that risk factors vary based on the types of conversations experienced by these women. Future surveys may want to assess such aspects of the conversations. Other social determinants of provider-patient conversation such as social support or race-related stress were not included in this paper because of concerns with statistical power, though these determinants should be considered in future research. It is important to remember that variables such as race/ethnicity and nativity comprise heterogeneous subgroups. For instance, Hispanics comprise individuals from Mexico and from South American countries. It is possible that these unique experiences are overlooked when individuals are combined into a race/ethnic category. Finally, if possible, our understanding of the social determinants would benefit from observations of the actual interchanges between providers and their patients.

Conclusion

These data highlight the effect of social determinants on provider-patient conversations pertaining to perinatal depression, an aspect of health care important for the assessment and treatment of perinatal depression. However, explanations underlying disparities in the detection of perinatal health remain somewhat occult. On one hand, those identified to be at-risk from this literature (i.e., young women, Black, and Hispanic) were more or as likely to have had a conversation about mood with their provider. On the other hand, other groups also identified to be at-risk

from the literature were less likely to have had this conversation (i.e., A/PI, non-US born women). Health care providers should notice behavioral patterns or health care structures that maintain these inconsistencies, and which overlook those at most risk for perinatal depression. Furthermore, policymakers should be aware of certain health care characteristics and their effect on actual provider-patient processes. Aside from determining whether at-risk groups are being adequately assessed, it remains striking that a large proportion of women across all groups have not had a conversation about mood with their providers.

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