Pandemic-related pregnancy stress and anxiety among women pregnant during the coronavirus disease 2019 pandemic

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OBJECTIVE: Prenatal maternal stress and anxiety, whether at times of disaster or not, are well-established risk factors for preterm birth, low birthweight, and infant health problems and may have long-lasting effects on the offspring.[1,2] Approximately 21% to 25% of women experience prenatal anxiety symptoms (eg, excessive worry, nervousness, agitation). Policies to decrease the spread of the novel coronavirus disease 2019 (COVID-19) by sheltering in place and social distancing and increases in unemployment, poverty, and intimate partner violence have dramatically changed the daily lives of pregnant women and presumably heightened maternal stress and subsequent anxiety.[3] The COVID-19 pandemic has created an urgent need to examine the extent to which pandemic-related stress predicts heightened anxiety in women pregnant during this crisis.

STUDY DESIGN: At the end of April 2020, 788 pregnant women were recruited through social media to complete an online questionnaire. Study inclusion criteria were being pregnant at the time of questionnaire completion and older than 18 years. Exclusion was inability to read or write English. The study was approved by the Institutional Review Board of Stony Brook University.

The questionnaire included sociodemographic factors (maternal age, ethnicity and race, financial status, health insurance, lifetime experience of emotional or physical abuse), current use of psychiatric medications, obstetrical factors (parity, gestational age, pregnancy risk, chronic medical conditions, planned pregnancy, fertility treatments), prenatal behaviors (eg, vitamins, exercise, enough sleep), alterations to prenatal care appointments (cancellation or rescheduling owing to COVID-19), and anxiety (generalized anxiety disorder-7 [GAD-7] with the following clinical cutoff values: 0−4, no to minimal; 5−9, mild; 10−14, moderate; and 15−21, severe).

COVID-19-related concerns were assessed using the pandemic-related pregnancy stress (PREPS) scale, a novel instrument developed by our research team.[4] Exploratory factor analysis on a random half of the sample confirmed its 3 constituent factors as follows: preparedness stress (7 items; eg, "I am worried I will not be able to have someone with me during the delivery"), perinatal infection stress (5 items; eg, "I am worried that my baby could get COVID-19 at the hospital after birth"), and positive appraisal (3 items; not relevant to this study). Confirmatory factor analysis on the second half of the sample indicated good model fit as follows: comparative fit index, 0.93; Tucker-Lewis index, 0.92; root mean square error of approximation, 0.076; and standardized root mean square residual, 0.079. Stress scales were internally consistent (Cronbach's α>0.80). We used hierarchical binary logistic regression to predict odds risk for minimal or mild anxiety vs moderate or severe anxiety.

RESULTS: Participants were on average aged 29.2±5.3 years and their average gestational age was 25.3±9.1 weeks. Approximately three-quarters were white and non-Hispanic (n=608, 77.2%); almost half were primiparas (n=362, 45.9%).

A total of 166 women (21.1%) reported no to minimal anxiety symptoms (GAD-7=0−4), 280 (35.6%) reported mild anxiety symptoms (GAD-7=5−9), 170 (21.6%) reported moderate anxiety symptoms (GAD-7=10−14), and 171 (21.7%) reported severe anxiety symptoms (GAD-7≥15). Logistic regression predicted moderate or severe anxiety from all sociodemographic and obstetrical background variables and the 2 PREPS scales (Table). The first step included sociodemographic variables (R^2=0.07) and the second step included medical and obstetrical variables (ΔR^2=0.09). The last step included all previous variables as confounders and added the 2 PREPS scales (ΔR^2=0.12). In the final model (total R^2=0.28), abuse history, high-risk pregnancy, preparedness stress, and perinatal infection stress all independently predicted greater likelihood of moderate or severe anxiety. Older maternal age and better prenatal health behaviors were protective against anxiety.

CONCLUSION: Pregnant women during the COVID-19 pandemic experienced substantial anxiety as indicated by the high prevalence of mild, moderate, and severe anxiety in this sample. Stress related to preparation for birth during the pandemic and worries about COVID-19 infection to self and the baby can elevate women's risk of experiencing moderate or severe anxiety over and above sociodemographic, obstetrical, and other health relevant factors.

Brief interventions to improve self-efficacy and motivate women to engage in healthy activities could be useful in decreasing anxiety. Engaging women in-person or through telemedicine and providing information regarding COVID-19 infection safety procedures for labor, delivery, and postpartum would likely alleviate some stress and subsequent anxiety. Women should also be routinely screened for psychosocial vulnerabilities,[4] especially during this pandemic. It is more important than ever to identify and refer women experiencing substantial anxiety and those who have previously experienced emotional or physical abuse because they may be at an increased risk while sheltering in place with an abusive partner.

TABLE
Binary multivariate hierarchical logistic regression predicting moderate or severe anxiety symptoms (n = 788)

	Step 1		Step 2		Step 3	
	aOR	95% CI	aOR	95% CI	aOR	95% CI
Older maternal age	0.54[b]	0.36–0.81	0.39[c]	0.24–0.61	0.46[b]	0.28–0.74
Racial and ethnic minority	0.91	0.64–1.29	0.97	0.67–1.41	1.24	0.83–1.85
Married or cohabiting	0.76	0.49–1.16	0.71	0.45–1.13	0.75	0.46–1.22
Financial insecurity	1.13	0.78–1.64	0.91	0.61–1.35	0.86	0.56–1.30
Abuse history	2.06[c]	1.44–2.95	1.82[b]	1.25–2.66	1.85[b]	1.24–2.75
Private insurance	0.79	0.55–1.4	0.78	0.53–1.16	0.82	0.53–1.25
Primipara			1.07	0.77–1.47	1.25	0.89–1.77
Gestational age			1.00	0.99–1.02	1.00	0.98–1.01
Planned pregnancy			1.11	0.78–1.59	1.21	0.83–1.77
Fertility treatment			0.83	0.48–1.45	0.79	0.44–1.43
Chronic illness			1.29	0.91–1.84	1.18	0.82–1.72
High risk[d]			1.79[b]	1.27–2.53	1.52[a]	1.06–2.19
Healthy behaviors			0.64[c]	0.54–0.75	0.65[c]	0.54–0.78
Appointment altered			1.49[a]	1.09–2.02	1.12	0.81–1.56
Psychiatric medication			0.86	0.50–1.46	0.74	0.42–1.31
PREPS scale—preparedness					1.75[c]	1.35–2.26
PREPS scale—infection					1.55[c]	1.28–1.88
	$R^2 = 0.07$		$R^2 = 0.16$		$R^2 = 0.28$	

aOR, adjusted odds ratio; *CI*, confidence interval; *PREPS*, pandemic-related pregnancy stress.

[a] $P<.05$; [b] $P<.01$; [c] $P<.001$; [d] Women who reported being high risk and those who were unsure were grouped together.

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As the COVID-19 public health crisis evolves, additional research is imperative to evaluate mental health difficulties in pregnant and postpartum women and examine the resilience and risk factors associated with favorable outcomes vs persistent psychopathology and their effects on perinatal and long-term health.[5] ∎

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