



Maternal Depression and its Effect on Spontaneous and Indicated Preterm Births within the nuMoM2b Cohort

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Background

- Known risk factors for preterm birth include low SES, low level of education, extremes of maternal age, and history of preterm birth.
- Maternal mental health is a significant factor in the incidence of preterm birth
- Diagnosis of a psychiatric disorder significantly increases the risk of preterm birth.^{1,2}
- Approximately 25.3% of pregnant women are diagnosed with a psychiatric disorder, of which 10% have depression.^{1,3}
- The effect of depression on preterm birth is unclear as available studies report conflicting results.^{1,4}

Objectives

To evaluate the role of depression in spontaneous and indicated preterm birth (PTB) within the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-Be (nuMoM2b) cohort and maternal comorbidities.

Study Design

This study was a secondary analysis of the NICHD study: nuMoM2b

Primary Study: nuMoM2b is a large multisite prospective observational cohort study of 9289 nulliparous women across the United States. Participants had no previous pregnancies lasting >20weeks. Data collected included EMR data, self-administered questionnaires, and four visit interviews.

Our Secondary Analysis

- Outcome data of a live birth was required for inclusion
- Patients were categorized as exposed or unexposed to maternal depression
- Maternal depression was defined as a score ≥12 on the Edinburgh Postnatal Depression Scale which was administered during two points during the pregnancy at Visit 1 and Visit 3
- PTB was defined as delivery <37 weeks and further divided into spontaneous and indicated PTB
- Maternal demographics, medical histories, and pregnancy outcomes were extracted
- Statistical analysis included Chi square, student t tests, and logistic regression with significance levels of <0.05

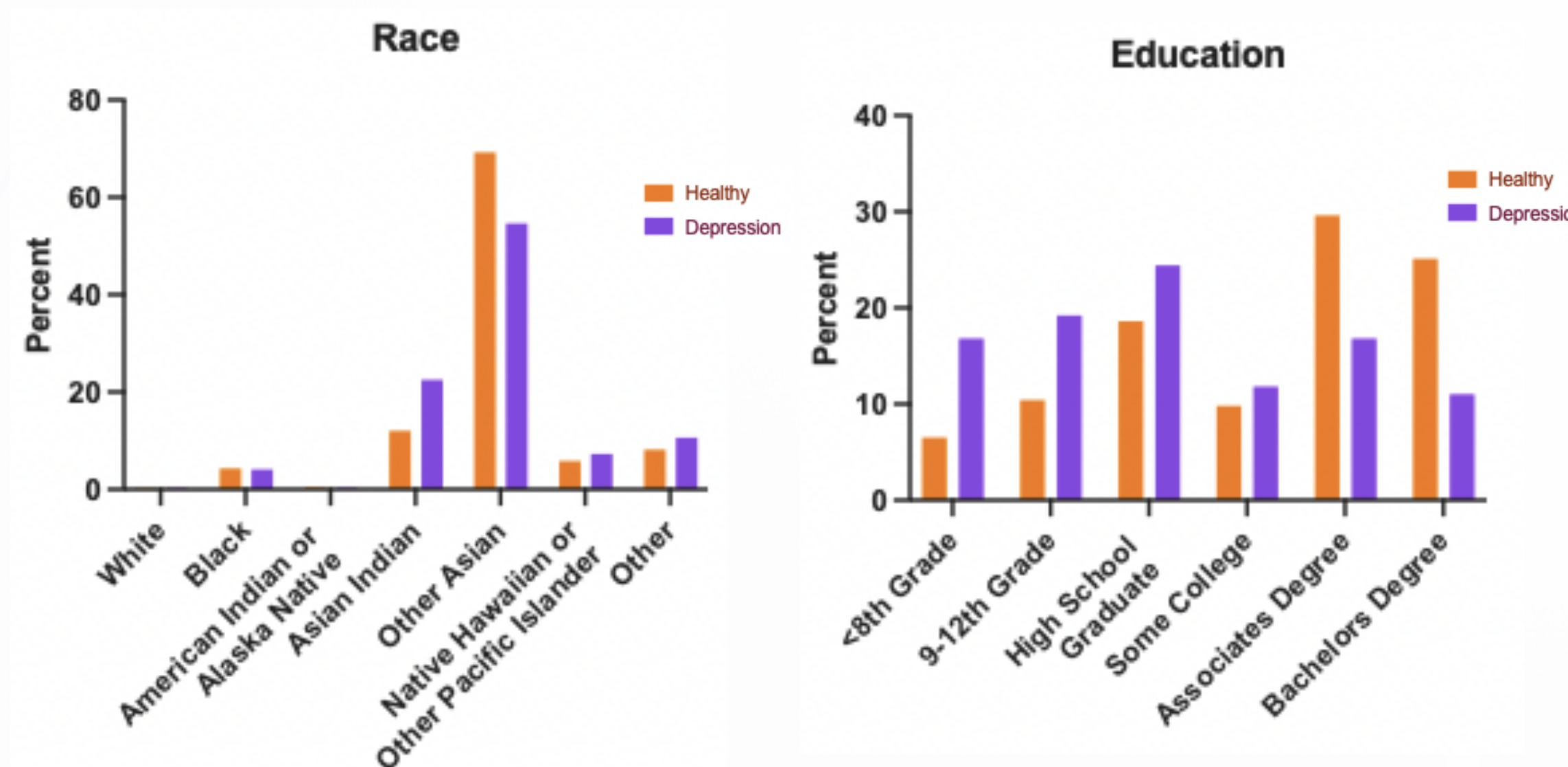
Results

8745 nulliparous women were included in analysis 1283 (14.7%) with depression and 7462 (85.7%) without depression.

- There were multiple significant differences between Depression & Healthy Groups including racial distributions and education level distributions (both p<0.0001)
- Groups were similar for pregestational diabetes mellitus, hypertension, gravidity, and substance use (alcohol, cocaine, heroin, prescription narcotic)

Significant Differences Between groups

| Category | Depression | Healthy | P value |
|--|------------|----------|---------|
| Demographics | | | |
| Age | 24.8+5.8 | 27.3+5.5 | <0.001 |
| Any college education | 39.7% | 64.5% | <0.001 |
| Income below FPL | 31.0% | 13.7% | <0.001 |
| Hispanic | 79.5% | 83.9% | 0.002 |
| Mean BMI | 27.3+0.4 | 26.2+0.1 | <0.001 |
| Maternal obesity (>30kg/m ²) | 33.0% | 26.1% | <0.001 |
| Medical factors | | | |
| Any medications for depression | 17.5% | 7.2% | <0.001 |
| Tobacco use | 18.2% | 6.4% | <0.001 |
| Maternal asthma | 18.4% | 13.3% | <0.001 |
| Prior cervical surgery | 5.6% | 7.6% | <0.001 |
| Depression related factors | | | |
| Any medications for depression | 17.5% | 7.2% | <0.001 |
| Risk of self-harm | 23.5% | 2.2% | <0.001 |



Outcome of PTB

- Depression group had greater spontaneous PTB rate (9.5% v 7.4%; p=0.04), and greater indicated PTB rate (12.6% v 9.2%; p=0.02).
- On logistic regression modeling, maternal depression did not remain an independent predictor of spontaneous or indicated PTB
- Spontaneous & Indicated PTB found to be significantly associated with some maternal demographics and medical comorbidities (red in table below)

Exposure Effects on Spontaneous & Indicated PTB

| Preterm birth category | Odds ratio | 95% CI | P value |
|--|------------|--------------|---------|
| Spontaneous preterm birth | | | |
| Maternal depression | 1.23 | 0.87 to 1.75 | 0.22 |
| Maternal asthma | 0.95 | 0.66 to 1.38 | 0.82 |
| Maternal Obesity (>30kg/m ²) | 1.40 | 1.06 to 1.86 | 0.02 |
| Maternal Age >35 years | 1.63 | 1.13 to 2.35 | 0.01 |
| Pregestational diabetes mellitus | 3.82 | 1.56 to 9.34 | 0.003 |
| Maternal hypertension | 1.57 | 0.63 to 3.88 | 0.33 |
| Income Below FPL | 1.14 | 0.79 to 1.63 | 0.47 |
| Prior cervical surgery | 2.27 | 1.59 to 3.23 | <0.001 |
| Any college education | 0.68 | 0.50 to 0.91 | 0.01 |
| Any medications for depression | 1.33 | 0.91 to 1.92 | 0.14 |
| Indicated preterm birth | | | |
| Maternal depression | 1.16 | 0.76 to 1.76 | 0.48 |
| Maternal asthma | 1.12 | 0.74 to 1.69 | 0.58 |
| Maternal Obesity (>30kg/m ²) | 1.69 | 1.23 to 2.32 | 0.001 |
| Maternal Age >35 years | 1.15 | 0.73 to 1.79 | 0.55 |
| Pregestational diabetes mellitus | 2.02 | 1.05 to 3.91 | 0.04 |
| Maternal hypertension | 3.52 | 2.18 to 5.69 | <0.001 |
| Income Below FPL | 1.49 | 0.98 to 2.26 | 0.06 |
| Prior cervical surgery | 1.48 | 0.88 to 2.49 | 0.13 |
| Any college education | 0.81 | 0.56 to 1.15 | 0.24 |
| Any medications for depression | 0.78 | 0.45 to 1.35 | 0.37 |

Conclusion

- Maternal depression by itself was not an independent predictor of spontaneous or indicated preterm birth
- Maternal obesity and preexisting diabetes were independent predictors of both spontaneous and indicated PTB
- Advanced maternal age and prior cervical surgery predicted spontaneous PTB, whereas hypertensive disorders predicted an indicated PTB
- Education had a protective effect on spontaneous PTB

Discussion

This analysis found that maternal depression is not associated with spontaneous or indicated PTB in nulliparous women. However, some maternal demographics and medical factors did have positive associations with PTB.

- The lack of association of depression with PTB is in agreement with other studies in which maternal depression was determined by utilizing validated assessment tools.^{1,4}
- The effects of the reported maternal demographics and medical factors on PTB are also in line with current literature.^{1,2,5-10}

The inclusion of only nulliparous women allows the relationship of depression and PTB to be defined separately from the greatest risk factor for PTB— prior PTB.

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