Risk Factors for Postpartum Depressive Symptoms in Oregon Women:
An Analysis of the PRAMS 2004 Data Set

Marika Wolfe, MS4
Thesis Defense Presentation
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Why This Topic?

Objective 1
Determine prevalence of postpartum depressive symptoms (PDS) among Oregon women

Objective 2
Determine significant risk factors for PDS in Oregon women

Objective 3
Explore race and ethnicity and income level by subcategories
Presentation Outline

1. Background and Significance
2. Methods
3. Results/Discussion
4. Limitations
5. Future Research/Recommendations
“I was filled with the anxiety … and … grief because my life changed so irrevocably. I was terrified … I was ready to die of grief and the feeling of entrapment…I didn't want her.”

"Why do mothers have to pretend … Why does PPD have a certain shame to it... it is, in fact, the most logical manifestation on the face of the earth? … "Labor is a set of contractions/and then a mother is born.”

“I always thought I would immediately feel closer to my child than I did to anybody else in my life… What a horrible mother I was!...I felt numb to her crying…My profound detachment made me suffer unbearably… I remember … envisioning myself jumping…the frightening part was that my thoughts felt extremely rational.”
**Definition**

Postpartum Blues: 50% of women

Postpartum Depression: 12-16% of women

Postpartum Psychosis: 0.1% of women
Biological Causes

Declining reproductive hormones:
- Not clearly established
- Challenged by miscarriage, abortion and adoption
Social and Environmental Risk Factors

- Lower self-esteem
- History of depression before or during pregnancy
- Increased life stress
- Decreased social support
- Difficult marital relationship
- Infant temperament
- Younger age
- Non-White race and ethnicity
- Unplanned or unwanted pregnancy
- Lower education
- Unmarried
- Lower income
- Medicaid recipient
- Overweight or obese women higher risk
Importance of Early recognition

Adverse outcomes for Mother and Child:

- Depression later on in life
- Maternal-infant bonding
- Attachment
- Social interaction
- General cognitive and emotional development
Difficulties in Recognition

More than 50% of women with PPD are missed:

- Difficult adjustment period
- Minimal doctor contact
- Insufficient physician training or screening of women
- Social stigma
Screening Instruments

Edinburgh Postnatal Depression Scale (EPDS)

- Self-administered 10 item scale
- Assesses women who might be at higher risk
Who should screen?

**Ob/gyn:**
- Prenatal care and birth
- *But* minimal contact after delivery

**Pediatricians:**
- Consistent contact with mother
- *But* limited time, insufficient training
- *But* health insurance referral limitations

**Family Doctors:**
- Involved in mother and infant care
- Training appropriate
- *But* time barriers
Methods: PRAMS Data

Pregnancy Risk Assessment and Monitoring System
- Created by CDC
- Implemented by 39 states
- Maternal experiences before, during and after pregnancy
- Survey of 80 questions
- Large selection of questions
- PRAMS administration process:
  1. Pre-letter
  2. Full questionnaire, second and third follow-up
  3. Phone call follow up
PRAMS: Sampling Methodology

- 1998: Oregon PRAMS
- Depression questions added in 2004
- Administered by Office of Family Health, Oregon Dept of Human Services
- Stratified random sample of women
- Linked to birth certificate data
PRAMS: Weighting Methodology

Weighted to reflect Oregon Population by three factors:

- Sampling, six strata:
  1. Non-Hispanic White, normal birth weight (>=2500g)
  2. Non-Hispanic White, low birth weight (<2500g)
  3. Non-Hispanic African American
  4. Hispanic
  5. Non-Hispanic Asian/Pacific Islander
  6. Non-Hispanic American Indian/Alaskan Native

- Non-response
- Non-coverage
Outcome Variable: Qualification

- Postpartum depression a clinical diagnosis
- PRAMS: *postpartum depressive symptoms (PDS)*
- Study: Same two questions had similar sensitivity and specificity to longer validated diagnosing tools
- Suggests women experiencing PDS also experience PPD
- For accuracy, outcome is PDS
## Outcome Variable: Coding

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Original questions</th>
<th>Collapsed answers</th>
<th>Combined answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postpartum Depressive Symptoms</td>
<td>Since your new baby was born, how often did you feel down, depressed, or hopeless?</td>
<td>Yes=Always, often&lt;br&gt;No=Sometimes, rarely, never</td>
<td>Yes=yes to both or either question</td>
</tr>
<tr>
<td></td>
<td>Since your new baby was born, how often have you had little interest or little pleasure in doing things?</td>
<td>Yes=Always, often&lt;br&gt;No=Sometimes, rarely, never</td>
<td>No=No to both</td>
</tr>
</tbody>
</table>
Methods: Statistical Analysis

- **Tools:** STATA Version 8.2
- **Steps:**
  1. Descriptive Statistics
  2. Logistic Regression:
     a) Bivariate
     b) Multivariate
  3. Analysis:
     a) race/ethnicity
     b) income subcategories
Methods: Data Management

Independent variables:

- Risk factors in prior literature
- Additional variables of interest
  - Dental care
  - Partner related stress
  - Behavioral
- Recoded into binary variables
Initial Model: Independent Variables

Demographic variables:

- Mother’s race/ethnicity
- Income
- Mother’s age
- Medicaid recipient
- Marital Status
- Education Level
- WIC status
- Birth-place
- Urban/rural location
Initial Model: Independent Variables

Characteristic and behavioral variables:

- Mother’s BMI
- Prenatal Stress (Partner-related, Emotional, Financial, Traumatic)
- Physical abuse Pregnancy intention
- Insufficient Dental Care
- Exercise
- Breastfeeding
- Previous live births, terminations, and pregnancy losses
- Maternal smoking and alcohol use
- Prenatal care
Race/Ethnicity & Income: Subcategories

Race/Ethnicity:
- Non-Hispanic (NH) White (referent)
- Hispanic
- NH Black
- NH American Indian
- NH Asian/Pacific Islander

Income (% Federal Poverty Level for 2004):
- 0-49
- 50-99
- 100-199
- 200-299
- 300+ (referent)
Objective 1 Results: PDS Prevalence

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>PDS Prevalence</th>
<th>% difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>13.2%</td>
<td>N/A</td>
</tr>
<tr>
<td>Unmarried</td>
<td>18.9</td>
<td>+8.5</td>
</tr>
<tr>
<td>Age $\leq 24$</td>
<td>17.2</td>
<td>+6.4</td>
</tr>
<tr>
<td>Education $&lt;12$ years</td>
<td>19.6</td>
<td>+7.9</td>
</tr>
<tr>
<td>WIC enrolled</td>
<td>17.9</td>
<td>+8.1</td>
</tr>
<tr>
<td>Medicaid Recipient</td>
<td>26.1</td>
<td>+14.6</td>
</tr>
<tr>
<td>Mistimed pregnancy Unwanted pregnancy</td>
<td>13.6 25.6</td>
<td>+3.3 +15.3</td>
</tr>
<tr>
<td>Physical abuse during pregnancy</td>
<td>40.8</td>
<td>+28.2</td>
</tr>
<tr>
<td>Mother’s $\geq 25$ m/kg</td>
<td>16.9</td>
<td>+7</td>
</tr>
<tr>
<td>Maternal Smoking</td>
<td>16.9</td>
<td>+4.3</td>
</tr>
<tr>
<td>Maternal Alcohol Use</td>
<td>24.8</td>
<td>+11.7</td>
</tr>
</tbody>
</table>
# Objective 1 Results: PDS Prevalence

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>PDS Prevalence (% weighted)</th>
<th>% difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race and Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>11.5</td>
<td>Referent</td>
</tr>
<tr>
<td>Hispanic</td>
<td>17.4</td>
<td>+5.9</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>21.6</td>
<td>+10.1</td>
</tr>
<tr>
<td>Non-Hispanic AI</td>
<td>20.9</td>
<td>+9.4</td>
</tr>
<tr>
<td>Non-Hispanic A/PI</td>
<td>15.8</td>
<td>+4.3</td>
</tr>
<tr>
<td><strong>Income (% FPL)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300+</td>
<td>7.1</td>
<td>Referent</td>
</tr>
<tr>
<td>200-299</td>
<td>13.5</td>
<td>+6.4</td>
</tr>
<tr>
<td>100-199</td>
<td>14.0</td>
<td>+6.9</td>
</tr>
<tr>
<td>50-99</td>
<td>14.3</td>
<td>+7.2</td>
</tr>
<tr>
<td>0-49</td>
<td>23.8</td>
<td>+16.7</td>
</tr>
</tbody>
</table>
Discussion: Objective 1

Prevalence
- OR: 13.2%
- Similar to prior studies: 12-16%

Trend for race and ethnicities and income similar
Objective 2 Results: Risk Factors

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Multivariate OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>Referent</td>
</tr>
<tr>
<td>Non-White</td>
<td>1.17 (1.03, 1.33)</td>
</tr>
<tr>
<td><strong>Mother BMI</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;25 m/kg²</td>
<td>Referent</td>
</tr>
<tr>
<td>≥ 25 m/kg²</td>
<td>1.70 (1.07, 2.70)</td>
</tr>
<tr>
<td><strong>Partner-related stress</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Referent</td>
</tr>
<tr>
<td>Yes</td>
<td>3.44 (2.14, 5.54)</td>
</tr>
<tr>
<td><strong>Income (%FPL)</strong></td>
<td></td>
</tr>
<tr>
<td>&gt; Or = 300</td>
<td>Referent</td>
</tr>
<tr>
<td>&lt; 300</td>
<td>1.28 (1.10, 1.48)</td>
</tr>
<tr>
<td><strong>Insufficient Dental Care</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Referent</td>
</tr>
<tr>
<td>Yes</td>
<td>1.93 (1.08, 3.45)</td>
</tr>
</tbody>
</table>
Discussion: Objective 2 (Not Surprising)

Mother’s BMI:
- Odds ratio 1.70 (1.07, 2.70)
- Similar to Utah PRAMS study results
  a) Negative body image
  b) Lower self-esteem

Partner-related prenatal stress:
- No direct evaluation in prior studies
  a) Social support
  b) Father involvement
  c) Physical abuse
- Partner role important
Discussion: Objective 2 (Surprising)

Insufficient Dental Care

- Nearly 2-fold increased risk OR 1.93 (1.08, 3.45)

- Difficult relationship to elucidate
  a) May be proxy variable
  b) Clinical reasons that this is important?
## Objective 3 Results: Race/ethnicity & Income

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Multivariate OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income (%FPL)</td>
<td>Referent</td>
</tr>
<tr>
<td>&gt; = 300+</td>
<td>2.03 (0.91, 4.57)</td>
</tr>
<tr>
<td>200-299</td>
<td>1.83 (0.89, 3.79)</td>
</tr>
<tr>
<td>100-199</td>
<td>2.15 (0.98, 4.69)</td>
</tr>
<tr>
<td>50-99</td>
<td>3.01 (1.53, 5.93)</td>
</tr>
<tr>
<td>0-49</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race and ethnicity</th>
<th>Referent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic White</td>
<td>1.34 (0.81, 2.23)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.54 (0.91, 2.60)</td>
</tr>
<tr>
<td>NH Black</td>
<td>1.45 (0.87, 2.43)</td>
</tr>
<tr>
<td>NH American Indian</td>
<td>1.90 (1.16, 3.13)</td>
</tr>
</tbody>
</table>
| NH Asian/Pacific Islander | }
Discussion: Race and ethnicity

Hispanic, NH Black, NH American Indian:
- Not statistically significant
- Limited studies on race/ethnicity, most focused on Black and Hispanic women
- Findings consistent with other studies

Asian/Pacific Islander:
- Statistically significant
-Nearly two fold increase in risk
- Very few studies to compare
Asian/Pacific Islander Risk?

- Cultural differences:
  a) Immigration (77.8% foreign nativity)
  b) Acculturation
- Perception of mental health
- Symptom interpretation
- Expectations of motherhood
- Family relations
- Not enough support upon immigration to U.S.
- Cultural traditions of motherhood
- Other unidentified cultural factors
Conclusions

- Prevalence: Oregon similar to prior studies

- Unsurprising significant risk factors:
  a) Mother’s BMI
  b) Partner-related Stress
  c) Lower income level

- Surprising Significant risk factors:
  a) Insufficient Dental Care
  b) Asian/Pacific Islander women
Future Research & Recommendations

- Screening and training (including cultural competence)
- Address social stigma
- Validate with another year’s data
- Asian/Pacific Islander subgroups (i.e. foreign vs native)
- Interactions between race/ethnicity, nativity, and income
- Other cultural risk factors
- The role of Oregon weather and SAD
  a) Fall 12.2%
  b) Winter 17%
  c) Spring 11.5%
  d) Summer 12.7%
- Fathers and PDS
Study Limitations

- Information bias
- Recall bias
- Timing of survey
- Cross-sectional Study
- Asian/Pacific Islander women broad group
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