FOOD INSECURITY AND STRESS AS COMMON CHALLENGES TO OPTIMAL NUTRITION DURING PREGNANCY

National Academies of Sciences
Nutrition during Pregnancy and Lactation
January 30, 2020
Barbara Laraia
PREVALENCE FOOD INSECURITY DURING PREGNANCY
NHANES 1999-2008

<300% Federal Poverty Level (n=688)

- 67% Food Secure
- 14% Marginally Secure
- 9% Food Insecure
- 12% Food Insecure

ASSOCIATION OF PSYCHOSOCIAL FACTORS AND FOOD SECURITY STATUS

* Adjusted models controlling for age, children, education, income, race, and marital status

### PREVALENCE OF ADVERSE LIFE EVENTS BY FOOD SECURITY STATUS

(AMIHA 2010 – 2012 N=20,480)

<table>
<thead>
<tr>
<th>Hardship</th>
<th>Food Insecure</th>
<th>Marginally Food Secure</th>
<th>Food Secure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prenatal depressive symptoms</td>
<td>41.5%</td>
<td>31.4%</td>
<td>18.9%</td>
</tr>
<tr>
<td>Partner lost job</td>
<td>19.9%</td>
<td>18.5%</td>
<td>10.6%</td>
</tr>
<tr>
<td>No practical support</td>
<td>18.9%</td>
<td>10.6%</td>
<td>12.3%</td>
</tr>
<tr>
<td>Respondent lost job</td>
<td>18.7%</td>
<td>7.1%</td>
<td>18.7%</td>
</tr>
<tr>
<td>No emotional support</td>
<td>18.7%</td>
<td>6.7%</td>
<td>12.7%</td>
</tr>
<tr>
<td>Domestic violence</td>
<td>18.2%</td>
<td>5.7%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Separated or divorced</td>
<td>13.2%</td>
<td>7.5%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Someone close with drug or alcohol problem</td>
<td>9.6%</td>
<td>5.4%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Someone close went to jail</td>
<td>4.6%</td>
<td>2%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Homeless or did not have a regular place to sleep</td>
<td>4.0%</td>
<td>1.1%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>
POSTPARTUM FOOD INSECURITY
↑ STRESS, ↑ EAT, ↑ % ENERGY FROM FAT, ↑ BMI AT 12 MONTHS

Adjusted for maternal age, maternal race, marital status, number of kids, maternal education, and maternal pre-pregnancy SES
MINDFULNESS DURING PREGNANCY
MIND Reduced Distress

- Perceived Stress (PSS):
  - Control: -1.13
  - MIND: -2.85

- Depression (PHQ):*
  - Control: -0.49
  - MIND: -2.56

*p < 0.05
MIND Associated with Below IOM Weight Gain Guidelines (n=184)

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below</td>
<td>3.77</td>
<td>1.24, 11.49</td>
<td>0.02</td>
</tr>
<tr>
<td>Adequate Reference Group</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Excessive</td>
<td>1.83</td>
<td>0.79, 4.23</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Adjusted for age at enrollment (continuous), prepregnancy BMI (continuous), and gestational age at last visit (continuous)
MIND Associated with Lower Oral Glucose Tolerance Test (n=141)

<table>
<thead>
<tr>
<th>mg/dl</th>
<th>Control Mean (SD)</th>
<th>MIND Mean (SD)</th>
<th>$\beta$</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>OGGT</td>
<td>111.8 (27.7)</td>
<td>100.3 (23.3)</td>
<td>-11.8*</td>
<td>-20.6, -3.0</td>
</tr>
</tbody>
</table>

* $\rho \leq 0.009$

Adjust for prepregnancy BMI, number of previous children birthed, and age at enrollment
SAN FRANCISCO INITIATIVE TO END FOOD INSECURITY DURING PREGNANCY

• Systems level approach started with Community Health Plan
• Pregnant women are a main partner
• 10 Partners
• Funded with soda tax money
WOMEN REPORT AN ARRAY OF CHALLENGES

- Getting the food you need
- Social
- Emotional
- Logistical
- Resources
- Types of Foods
SF ENDING FOOD INSECURITY INITIATIVE

• Coordinating services
• Co-locating federal food programs
• Vouchers 4 Veggies - $40 per month for 9 months in fresh fruit and vegetable vouchers

https://eatsfvoucher.org/our-programs/nutrition-for-pregnant-women/
CONCLUSIONS & FUTURE DIRECTION

1. Food Insecurity is a major stressor and highly prevalent
2. We need better food security and nutrition monitoring
3. Women need better access to fruits and vegetables
4. New organizational models are need to promote ending food insecurity during pregnancy
## Expect With Me: Centering During Pregnancy

<table>
<thead>
<tr>
<th>Session</th>
<th>Weeks</th>
<th>Theme</th>
<th>4-5 Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13-17</td>
<td>You’re a healthy mom</td>
<td>Diet, PA, weight</td>
</tr>
<tr>
<td>2</td>
<td>17-21</td>
<td>Staying health and strong through change</td>
<td>Stress, sleep, safety</td>
</tr>
<tr>
<td>3</td>
<td>21-24</td>
<td>Breastfeeding = Healthy babies and moms</td>
<td>Breastfeeding</td>
</tr>
<tr>
<td>4</td>
<td>25-29</td>
<td>Health moms building health relationships</td>
<td>GDM, HIV,</td>
</tr>
<tr>
<td>5</td>
<td>27-31</td>
<td>Health moms and healthy labor</td>
<td>Labor, birth</td>
</tr>
<tr>
<td>6</td>
<td>29-33</td>
<td>Healthy labor</td>
<td>Stages, delivery</td>
</tr>
<tr>
<td>7</td>
<td>31-35</td>
<td>Healthy labor and health relationships</td>
<td>Relationships</td>
</tr>
<tr>
<td>8</td>
<td>33-37</td>
<td>Taking care of mom and baby</td>
<td>Caring for baby</td>
</tr>
<tr>
<td>9</td>
<td>35-39</td>
<td>Preparing for healthy future</td>
<td>Breastfeeding, DPS</td>
</tr>
<tr>
<td>10</td>
<td>37+</td>
<td>Build a health future</td>
<td>Work &amp; child care</td>
</tr>
</tbody>
</table>
POSITIVE FEED-BACK BETWEEN DISTRESS AND HIGHLY PALATABLE FOOD

Severe or Chronic Stressor → Stress → Anxiety → Abdominal Fat

HP Food → Excessive Reward Drive
• HPF from the literature aligned with three clusters:
  • (1) Fat and Sodium
    • (> 25% kcal from fat, ≥ 0.30% sodium by weight)
  • (2) Fat and Simple Sugars
    • (> 20% kcal from fat, > 20% kcal from sugar),
  • (3) Carbohydrates and Sodium
    • (> 40% kcal from carbohydrates, ≥ 0.20% sodium by weight)
• FNDDS = 62% (4,795/7,757) of foods met HPF criteria.
↑ Inflammation From Healthy Fat in the Presence of Stress

Kiecolt-Glaser 2016
MIND Did Not Decrease Excessive Weight Gain

- % Below: N=29 (15.8%) Control: 11.1, MIND: 20.2
- % Recommended: N=29 (15.8%) Control: 20, MIND: 11.7
- % Above: N=126 (68.5%) Control: 68.89, MIND: 68.1
MIND Improved Acceptance

AAQ

Control
MIND

*p < 0.006