Maternal physical activity during pregnancy: trajectories, determinants, and health impacts

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Introduction

- According to the American College of Obstetricians and Gynecologists, healthy women during pregnancy and the postpartum should engage in moderate physical activity (PA) for 30+ minutes per day (Atal and O’Toole, 2002).
- Pregnant women following this guideline have lower incidence of gestational diabetes mellitus, less gestational weight gain, and reduction in insulin resistance level (Wang et al., 2017).
- Yet, many pregnant women fail to meet this standard and reasons remained under-explored (Broberg et al., 2015).

Aims

- Aim 1: To analyze PA trajectories of women throughout their pregnancy.
- Aim 2: To examine associations of season, employment status, and number of live births with PA trajectories during pregnancy.
- Aim 3: To examine impacts of PA on sleep quality and depression.

Methods

Timeline/Data Collection:

<table>
<thead>
<tr>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>End of Pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=67</td>
<td>n=22</td>
<td>n=19</td>
</tr>
</tbody>
</table>

Table 1. Methods of measurement

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical activity (PA)</td>
<td>International Physical Activity Questionnaire (IPAQ)</td>
</tr>
<tr>
<td>Sleep Quality</td>
<td>Pittsburgh Sleep Quality Index (PSQI)</td>
</tr>
<tr>
<td>Depression</td>
<td>Patient Health Questionnaire (PHQ)</td>
</tr>
<tr>
<td>Employment status</td>
<td>Questions relating to season during gestational period and number of live births</td>
</tr>
<tr>
<td>Number of live births</td>
<td>Socio-demographic factors and survey date</td>
</tr>
</tbody>
</table>

Domains of the IPAQ:

1. WORK
2. ACTIVE TRANSPORTATION
3. DOMESTIC AND GARDEN (YARD WORK)
4. LEISURE-TIME

Table 2. MET values used to calculate MET-minutes

<table>
<thead>
<tr>
<th>PA Intensity</th>
<th>MET Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>3.0-3.3</td>
</tr>
<tr>
<td>Moderate</td>
<td>4.0</td>
</tr>
<tr>
<td>Vigorous</td>
<td>6.0-8.0</td>
</tr>
</tbody>
</table>

Results

Table 3. PA categories

<table>
<thead>
<tr>
<th>PA category</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>Those individuals who do not meet the criteria for the moderate or high categories.</td>
</tr>
<tr>
<td>MODERATE</td>
<td>3 or more days of vigorous-intensity activity of at least 20 minutes per day OR 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day OR 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum total physical activity of at least 600 MET-minutes/week.</td>
</tr>
<tr>
<td>HIGH</td>
<td>Vigorous-intensity activity on at least 3 days achieving a minimum total physical activity of at least 1500 MET-minutes/week. OR 7 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum total physical activity of at least 3000 MET-minutes/week.</td>
</tr>
</tbody>
</table>

Figure 1. PA trajectories through pregnancy (p=0.788)

Figure 2. Trajectories of different types of PA

Figure 3. Impact of hours working on PA (p<0.001)

Figure 4. Impact of season on PA (p=0.263)

Figure 5. Impact of # of live births on PA (p=0.407)

Figure 6. PA trajectories, by sleep quality

Figure 7. Impact of depression on PA (p=0.151)

Figure 8. PA trajectories, by depression status

Conclusion

- Being employed was significantly associated with higher maternal PA during pregnancy.
- Maternal PA was lower in Spring than the other three seasons.
- Maternal PA seemed to decrease with severity of depression.

Future works:

- To enroll new participants to increase statistical power.
- To follow participants into postpartum to examine long-term PA.

Acknowledgments

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References


MET-minutes=(MET value) x (minutes engaged in PA)