Pandemic mindfulness: is there a difference in pregnancy and birth outcomes between women practicing relaxation techniques or not?

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Background

- COVID-19 pandemic experience is a factor contributing to the elevated psychological stress and anxiety levels in pregnant women (Preis et al., 2020; Boekhorst et al., 2021)

- Higher maternal stress leads to adverse child outcomes, e.g. lower birth weight, suboptimal brain development, biological aging, etc. (Nkansah-Amankra et al., 2010; Entringer et al., 2013; Tate et al., 2015)

- Maternal mindfulness activities during pregnancy were previously presented as protective factors against health, socio-emotional and behavioral disturbances in children (Van den Heuvel et al., 2015; Nyklíček et al., 2018; Ostlund et al., 2021)
Aim

To explore the association between practicing mindfulness techniques by women pregnant at the time of the COVID-19 pandemic and their pregnancy duration and birth outcomes

HYPOTHESIS: practicing mindfulness techniques → better pregnancy and birth outcomes
Materials and Methods

Participants
- **466** Polish women pregnant at the time of COVID-19 pandemic
- Mean age **30.7** (SD 3.62)
- Recruitment: **May-December 2020**

Collected data

Online questionnaire:
- Practicing relaxation techniques (yes/no + how often): yoga, meditation, relaxing music
- Maternal age and BMI, pregnancy complications, sex of the baby

Birth records:
- Birth weight (g)
- Birth length (cm)
- Head circumference (cm)
- Gestational age at birth (weeks)

Statistical analyses
- **General Linear Models** with categorical variables → women compared based on:
  
  A. the fact of practicing mindfulness techniques  
  B. the frequency of practicing mindfulness techniques (4 categories)

- **Covariates:** maternal age, maternal BMI, pregnancy complications, sex of the baby, duration of the gestation*  
  *depending on the model

Exclusion criteria
- Smoking, drinking alcohol while pregnant
- Twin pregnancy
- Birth weight <2.5 kg
- <37 weeks of pregnancy
### Results

**Practicing mindfulness techniques (yes/no)**

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>p</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age at birth (weeks)</td>
<td>5.13</td>
<td>0.02</td>
<td>0.011</td>
</tr>
<tr>
<td>Full model: p=0.049; η²=0.024</td>
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<tr>
<td>Birth weight (g)</td>
<td>0.95</td>
<td>0.33</td>
<td>0.002</td>
</tr>
<tr>
<td>Full model: p&lt;0.001; η²=0.167</td>
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<tr>
<td>Birth length (cm)</td>
<td>0.99</td>
<td>0.32</td>
<td>0.002</td>
</tr>
<tr>
<td>Full model: p&lt;0.001; η²=0.013</td>
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<tr>
<td>Head circumference (cm)</td>
<td>0.09</td>
<td>0.76</td>
<td>0.001</td>
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<td>Full model: p=0.004; η²=0.043</td>
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**Frequency of practicing mindfulness techniques (4 categories of frequency)**

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<tr>
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<th>F</th>
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<tbody>
<tr>
<td>Gestational age at birth (weeks)</td>
<td>2.98</td>
<td>0.02</td>
<td>0.025</td>
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<td>Full model: p=0.022; η²=0.038</td>
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<tr>
<td>Birth weight (g)</td>
<td>0.954</td>
<td>0.43</td>
<td>0.008</td>
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<td>Full model: p&lt;0.001; η²=0.172</td>
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<tr>
<td>Birth length (cm)</td>
<td>1.495</td>
<td>0.20</td>
<td>0.013</td>
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<td>Full model: p&lt;0.001; η²=0.113</td>
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<tr>
<td>Head circumference (cm)</td>
<td>0.705</td>
<td>0.59</td>
<td>0.007</td>
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<td>Full model: p=0.010; η²=0.050</td>
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Post-hoc test with Bonferroni correction: significant difference between groups „No” and „2-3 times a week” (p=0.04)
Summary

• Pregnant women who practiced mindfulness techniques (including the frequency of the practice) gave birth later on the average than women who did not practice relaxation (however, the observed effect size was small)

• No difference was observed for the birth measurements

• These preliminary results shed a light on a potential contribution of mindfulness practices to optimal pregnancy length, especially in the highly stressful COVID-19 pandemic context

Future research directions

• Experimental studies (interventions)
• Different mindfulness techniques analyzed separately
• More advanced predictors of child growth and pregnancy course