Previous cycle tracking with a wearable multiparameter device reduces time to conception

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Introduction

- Couples have relied on menstrual cycle tracking to engage in or avoid conception for centuries.⁴
- Tracking several physiological parameters simultaneously, wearable sensor technology has been shown to detect the fertile window with up to 90% accuracy.⁵

Research aim: To determine if women who cycle track using a wearable device prior to trying to conceive (TTC) become pregnant faster than women who did not cycle track first

Methods

- The Ava Fertility Tracker measures multiple physiological parameters including pulse rate, respiratory rate, skin perfusion, heart rate variability, and skin temperature. It is worn only while asleep and employs a machine learning algorithm in a corresponding smartphone app to predict the user’s current and upcoming fertility.
- User chooses from three in-app operational modes: cycle tracking; trying to conceive (TTC); or, pregnancy.
- Retrospective analysis of data from 19,838 American and European women who conceived using the Ava Fertility Tracker (e.g., real-world users)
  - Had to have reported a pregnancy in-app
  - Switched to pregnancy mode for at least 30 days
  - Included only first reported pregnancy
- Compared time to conception for women who used the cycle tracking mode, followed by TTC mode (Prior Cycle Trackers; PCT) to women who started in TTC mode (No Prior Cycle Tracking; NPCT)

Results

Table 1. Comparison of descriptive statistics between PCT & NPCT women who became pregnant using a wearable fertility tracker

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>Prior Cycle Tracking¹</th>
<th>No Prior Cycle Tracking¹</th>
<th>Covariate regression coefficient (b value)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>947</td>
<td>19,500</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Time to Conception</td>
<td>104 days (68)</td>
<td>121 days (87)</td>
<td>Underweight (-18 BMI): 9.01 (13.78)</td>
<td>.513</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overweight (+25 BMI): 4.53 (5.23)</td>
<td>.388</td>
</tr>
<tr>
<td>Body Mass Index (BMI)</td>
<td>24.45 kg/m² (5.28)</td>
<td>25.27 kg/m² (5.75)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>33.56 years (3.56)</td>
<td>32.07 years (3.80)</td>
<td>≥35 years: 1.13 (0.80)</td>
<td>.909</td>
</tr>
</tbody>
</table>

Note: Mean values reported, with standard deviations or standard errors in parentheses.

¹ Using the Ava Fertility Tracker. No data collected on alternative methods of cycle tracking.

- Mann-Whitney U-test: Time to conception significantly shorter for PCT versus NCT (U=7,957,928.00, p<.001)

- Bootstrap random sampling with replacement showed significantly shorter time to conception for PCT [95% CI: 99.93, 108.64] versus NCT [95% CI: 125.11, 127.56] women (mean difference=20.42 days, SD=2.29; 95% CI: 17.59, 26.58, p<.001)

Conclusion

- Among real-world users, cycle tracking with a wearable device was associated with shorter time to conception when TTC.
- Planned follow-up analyses will consider how Ava Fertility Tracker’s accuracy in predicting the fertile window changes over time for women in the PCT v. NCT groups.