INTRODUCTION

- Stress and anxiety in the perinatal period affect a range of health outcomes in both mothers and children, including preterm labor, birth complications, post-partum depression and neurodevelopment of children (Glovee, 2014).
- Cost-effective and easily-accessible treatments to reduce stress is thus essential to optimizing the health and well-being of pregnant women and their children (Adler et al., 2011; Evans et al., 2015).
- Computerized attention bias modification training (ABMT) is the targeted reduction of a key cognitive mechanism in stress and anxiety, the threat bias, or selective and exaggerated attention to threat (Bair-Haim et al., 2007; Hakumate et al., 2010).

We have taken the core components of ABMT and embedded them in a gamified mobile app called Personal Zen currently available for iOS devices. In two recent placebo-controlled studies with moderately anxious adults, Personal Zen reduced anxiety, stress reactivity, and threat bias in a single, lab-based session (Dennis & O’Toole 2014; Dennis-Tiwary et al., 2016).

The present study was a placebo-controlled randomized pilot clinical trial of Personal Zen in moderately anxious pregnant women over the course of one month. Biobehavioral indices of stress reactivity (cortisol, observed) and self-report of anxiety were collected (Buchanan et al., 1999; Hellemans et al., 2009).

To examine personalization of ABMT, we tested whether distinct neural responses to threat, measured via scalp-recorded event-related potentials, predicted ABMT response (Dennis-Tiwary et al., 2016).

PREDICTIONS

- ABMT versus placebo training (PT) versions of Personal Zen will reduce threat bias, anxiety, and stress reactivity.
- The magnitude of neural responses to threat prior to training will predict ABMT efficacy.

METHOD AND RESULTS

Participants: Women aged 23-45 (M = 32.97, SD = 5.52) between their 15th and 29th week of pregnancy were recruited from a large city hospital.

Training: Participants played Personal Zen for ~ 10 min/day 4 days/week for one month.

- ABMT version (n = 15), participants swiped a grass trail left behind by a pleasant sprite.
- Placebo Training (PT) version (n = 14), participants equally likely to swipe a grass trail left behind by a pleasant or angry sprite.

Depression Anxiety Stress Scale (DASS): The DASS-21 (Henry & Crawford, 2005) is a 21-item questionnaire that measures the severity of depression, anxiety, and stress-related symptoms.

The Hamilton Anxiety Scale (HAM-A): The HAM-A (Hamilton, 1959) was used to assess severity of anxiety symptoms with scores ranging from 0 to 56 and higher scores indicating increased severity.

Mood assessment: The Depression Anxiety Stress Scale (DASS-21): A 21-item questionnaire that measures the severity of depression, anxiety, and stress-related symptoms.

Neural Responses to Threat Predicted ABMT Effects on Anxiety

- Training Condition x P1 interaction: Anxiety was reduced when participants showed smaller P1 amplitudes, but was increased with larger P1 amplitudes. Cortisol secretion was reduced during lab-based stressors in the ABMT versus PT group.

Training Group effect on cortisol, PT: F(1, 22) = 15.39, p < .001, R^2 = .78; interaction step change statistics: F(1, 22) = 5.98, p = .02, R^2 = .06.

Threat bias was reduced in the ABMT versus PT group.

Reductions in Cortisol were Associated with Less Anxiety and Threat Bias

- Personal Zen Reduced Cortisol
  - Training Group effect on cortisol, F(1, 25) = 4.96, p = .037, partial η^2 = .18. Cortisol secretion over the course of the lab visit was reduced for ABMT versus PT.

- Personal Zen Reduced Threat Bias
  - Training Group effect on attention bias, F(1, 25) = 3.72, p = .065, partial η^2 = .13. Attention towards threat was reduced for ABMT versus PT.

References available upon request.

REFERENCES