# Virtual Reality Biofeedback for Postpartum Anxiety and Depression: A Feasibility Study

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## INTRODUCTION

- Cognitive behavioral therapy is a basic element of treatment for postpartum anxiety (ANX) and depression (DEP)1. Exacerbations of existing DEP and ANX are rising in concert with the COVID-19 pandemic2, with limited supply of mental health professionals that are trained to help these patients. Virtual Reality (VR) offers a potential solution to these care gaps, and VR has demonstrated success in treatment of pain, chronic disease, and other mental health conditions3-4. However, VR effectiveness for treatment of postpartum ANX or DEP has not been investigated. The purpose of this pilot trial is to test patient feasibility and acceptability of virtual reality biofeedback program in pregnant and postpartum women for ANX and DEP outcomes.

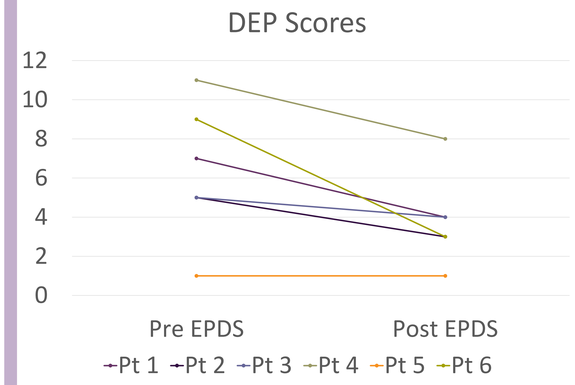
## METHODS

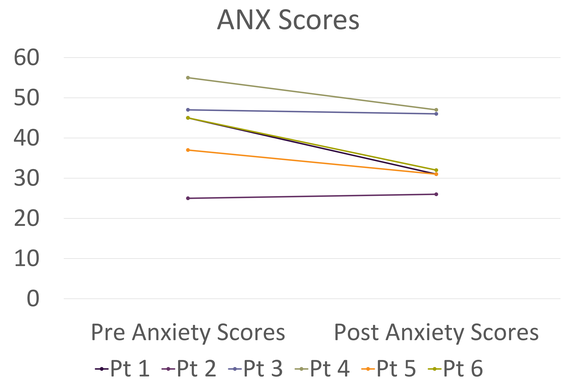
- Postpartum women with a history of ANX or DEP
- Intervention: Head mounted display (HMD), smartphone with software rendering stereoscopic images to the user and heart rate / respiratory rate sensors connected & displayed
- 30-minute VR session involved breathing exercises: users saw objects (linked to their heart rate) in a virtual world which changed movements with their breathing
- Users guided on how to modify breathing to change objects.
- Measures: Pre- and post-session ANX and DEP symptoms were measured by Edinburgh postnatal depression scale (EPDS) and State-Trait Anxiety Inventory (STAI). Acceptability was assessed by questions, “Would you participate in another session?” and “Would you participate in regular repeating sessions?” Enjoyability, ease of use, and other questions were assessed on a 1-5 Likert scale. Experience was rated on 11-point global experience numeric rating scale (NRS) where 0 is the worst and 10 is the best experience possible.
- Descriptive statistics were reported for acceptability questions and for the global experience ratings. Graphical representations of STAI and EPDS scores evaluated changes in ANX and DEP symptoms.

## RESULTS

- Six postpartum patients with ANX or DEP enrolled and completed sessions and assessment
- ANX and DEP scores were observed to improve in five of 6 (83.3%) participants, while one participant (16.7%) had no change in ANX or DEP symptoms (Figure)
- Five of 6 (83.3%) responded that they would participate in another session in the future and would participate in regular repeating sessions
- All subjects gave highest ratings of 5 (“completely agree”) for questions on ease of use, worthiness of time, and clarity of directions
- Median global experience rating was 9.5 (range, 8.25 to 10.0) on an 11-point NRS

**Figure**. State ANX (STAI) and DEP (EPDS) scores before and after each session among the six participants.
*STAI, State-Trait ANX Inventory. EPDS, Edinburgh Postnatal DEP Scale*




## SUMMARY

- VR with biofeedback is a feasible and acceptable modality to reduce acute postpartum ANX and DEP symptoms
- Future larger scale trials will investigate its efficacy for long-term postpartum ANX and DEP symptom reduction and will discern whether potential improvements in DEP scores are primarily driven by modulating ANX symptoms

***VR with biofeedback is a feasible and acceptable modality to reduce acute postpartum ANX and DEP symptoms.***

## REFERENCES

1.PMID: 29914574
2.PMID: 33964789
3.PMID: 34036696
4.PMID: 33952318

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