Virtual Reality Exercise Effects on College Students with Anxiety and Depression

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Introduction

Background: Both within and outside of the classroom, mental health has become a primary concern across college campuses. Particularly since the arrival of the COVID-19 pandemic, untreated anxiety and depression continue to hinder daily life for students. It is well-established that exercise is an effective behavioral intervention used in reducing the symptoms of both anxiety and depression (Henriksson et al., 2022; Rebar, 2015; Recchia et al., 2022). There has also been increasing evidence supporting the use of immersive virtual reality (VR) technology for treating symptoms of anxiety and depression, including the addition of VR to psychotherapy and exposure therapy (Baghaei et al., 2021). The combination of VR and exercise is an area of minimal research when it comes to its use as a supplemental treatment for anxiety and depression, particularly among college-aged students experiencing symptoms.

Purpose: The purpose of this study is to determine the acute physiological and psychological effects of immersive VR biking exercises on college students with anxiety and/or depression.

References

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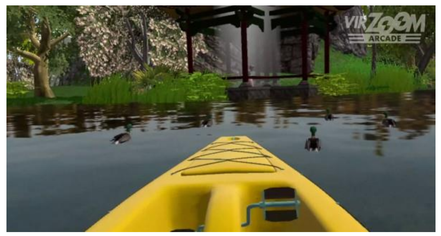
VirZOOM. (n.d.). Lotus pond [Online image]. www.virzoom.com

Methodology

Participants: A sample of fourteen college students with mild to moderate symptoms of anxiety and/or depression were recruited using flyers across the University of Minnesota Duluth campus. Participants were screened for the severity of their anxiety and depression symptoms using the Generalized Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire-9 (PHQ-9) questionnaires.

Measures: Participant's heart rate (HR) and rate of perceived exertion (RPE) were assessed at baseline and every four minutes during each trial. Psychological measures were assessed before and after each session. Mood was measured using the 24-item Brunel Mood Scale (BRUMS), which has 6 subscales (anger, confusion, depression, fatigue, tension, vigor). For each mood subscale, the sum of 4 items was calculated. Enjoyment and self-efficacy were measured using the average scores of 5-item and 3-item surveys, respectively.

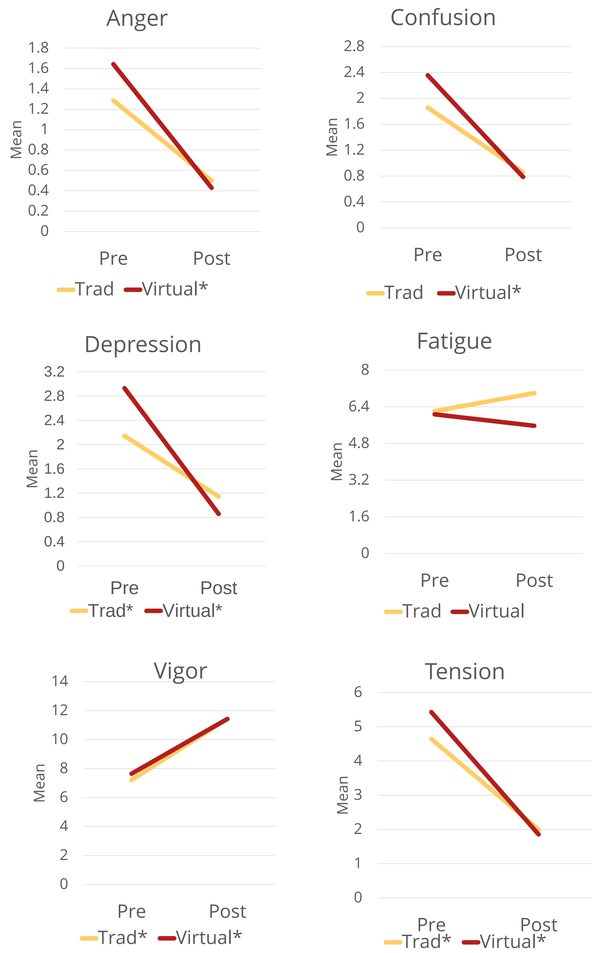
Procedure: Subjects completed two 20-minute biking sessions on a VirZoom exercise bike under two conditions in a randomized order. During the immersive VR condition, participants played the game "Lotus Pond" on VirZoom Arcade for the PlayStation. The traditional session was performed on the VirZoom bike without the VR headset. The resistance was set and adjusted throughout to keep participants exercising at a moderate intensity.



(VirZOOM, n.d.)

Results

The VR biking sessions resulted in a significant change in self-efficacy, as well as anger, confusion, depression, tension, and vigor. The traditional biking sessions resulted in a significant change in only depression, tension and vigor. BRUMS subscale score comparisons for changes in mood between exercise conditions are shown in the graphs below. Paired t-tests indicated there were no significant differences in HR, RPE, or enjoyment between the conditions.



Note. ***** Indicates significant difference from pre- to post-exercise assessment.

Discussion

College students suffering from mild to moderate symptoms of anxiety and depression can benefit from 20 minutes of exercise biking. While the physiological response was comparable between the two exercise conditions, VR exercise may be more effective at enhancing mood and self-efficacy compared to traditional exercise. Further research is needed to investigate differences between immersive and non-immersive VR, as well as the long-term effects of using VR during exercise.

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