Martino, SA_OVPR Seed Grant- Fall 2023: Effects of activity tracking and virtual reality mindfulness on stress and cardiometabolic health of college students.

Overview /Abstract

Significance: Many young adults, especially college students, are vulnerable to and experience high levels of stress and anxiety. In the past decade, mental health symptoms have doubled in all racial groups in the population of college students, and nearly 60% of undergraduate students at Stony Brook University have sought or are seeking out support for stress and/or anxiety. Research has shown stress and mental health status can significantly affect one's physical health and potentially cause obesity, diabetes, and cardiometabolic diseases. For college students, barriers to engaging in physical or alternative activities exist, including lack of time or facilities, fear of failure or injury, or lack of motivation. We propose to use physical activity monitoring (Fit Bits) and a novel virtual reality (VR) mindfulness intervention to promote physical activity and help college students manage their stress with a long-term goal to improve cardiometabolic health**.**

Innovation: The proposed study is novel since there have been few randomized trials measuring objective cardiometabolic parameters following a prolonged exposure of a VR intervention, and little is known about the additive effects of continuous monitoring (using a biofeedback device) and mindfulness delivered in a VR program. Additionally, interventions targeting stress and the prevention of heart disease in the college population are lacking. Finally, creating a model to improve screening and risk awareness of stress and stress related cardiometabolic diseases in young adults may inform university wellness programs and improve screening and management of this population.

Objectives and alignment with funding mechanism: This pilot study has three goals: 1) Examine the impact of using activity trackers and virtual reality mindfulness in attenuating the effects of unhealthy stress and improving physical activity (PA) and cardiometabolic health in a group of college students. To achieve this goal, students will complete a Perceived Stress Scale (PSS) and PA will be assessed via self-report using the International Physical Activity Questionnaire (IPAQ). Anthropometric measures such as height, weight, and body composition will be measured using air displaced plethysmography (ADP) and 3D body scanning. Cardiometabolic parameters including vital signs, plasma cortisol levels, Hemoglobin A1C [HbA1c], lipid and triglyceride levels, C-reactive protein (CRP), and blood cell count (red blood cells, white blood cells and platelets), will also be measured, 2) To develop a logistic regression model to determine if factors such as PSS, PA levels and cardiometabolic parameters can be used to predict intervention outcome (decrease in stress). This model may help health professionals to develop patient-centered intervention plans, and, 3) To create an interdisciplinary collaborative team of clinical and basic scientists and biomedical engineers to work towards understanding the role of stress and anxiety on overall cardiometabolic health in college students, and explore alternative treatments such as virtual reality in managing these conditions. Ultimately, the long-term goal is to develop an interdisciplinary team and collect preliminary data to support a future NIH or AHA grant application. Overall, the innovation, the significance and the interdisciplinary nature of the proposed study align well with this seed grant mechanism.