



Undergraduate

Research Symposium

ADVANCING RESEARCH AND STEM FIELD ENGAGEMENT



PROJECT

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Centenary University, Class of 2021

Major: **Biology**

Faculty **James Monks, Ph.D.**, Assistant Professor

Advisor: Department of Biology

Manipulating HRV in Adolescents with Anxiety Using Breathing Techniques

Individuals with psychological trauma have been observed to have decreased Heart Rate Variability. Poor HRV has been linked to increased risk of heart disease, Post-Traumatic Stress Disorder, and other co-morbidities. It is believed that a more acidic blood pH increases the occurrences of anxiety attacks, which is related to dysautonomia. By prolonging the exhalation pattern of breathing, there is upregulation of parasympathetic tone, which may cause a corresponding increase in HRV. It has been shown that increasing the period of exhalation lessens anxiety-related symptoms. Adults with anxiety related disorders as well as adults with unhealthy HRV show an overstimulation of the sympathetic nervous system. By measuring Heart Rate Variability before and after prolonged exhalation breathing exercises, HRV should improve. Characteristics of dysautonomia include varied HRV which is influenced by anxiety as a result of overstimulating the sympathetic nervous system. However, breathing exercises can be performed to help down regulate the sympathetic nervous system, decrease the intensity of panic, and restore healthy HRV. Currently, there is no known or recognizable treatment for poor HRV. Individuals suffering from anxiety and panic are typically treated with benzodiazepines which are addictive and mood altering. The ability to modify the symptoms of both can provide a safer alternative to potentially helping patients manage their own symptoms without drugs.

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