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The Relationship of Catastrophization, Pain Intensity, and Heart Rate Variability in Acute Pain - A Pilot Study

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THE RELATIONSHIP OF CATASTROPHIZATION, PAIN INTENSITY, AND HEART RATE VARIABILITY IN ACUTE PAIN – A PILOT STUDY

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Background

Reduction in heart rate variability (HRV) can strongly and independently predict adverse health outcomes. Chronic pain conditions are associated with reduced HRV, and HRV may be a biomarker for predicting chronic pain.

Purpose:

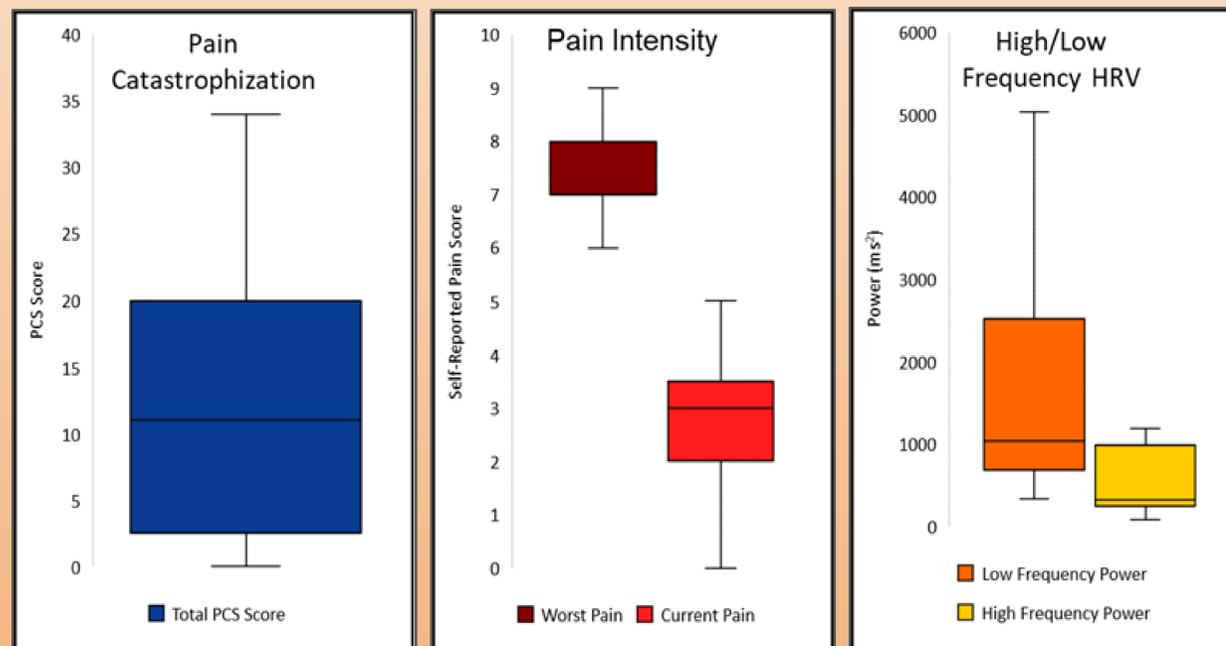
While pain intensity and catastrophization are associated with chronic pain, the aim of this study is to investigate their relationship with HRV in individuals with acute pain.

Methods

Fourteen subjects from two facilities participated. Data from two participants was excluded. HRV was collected while seated as participants completed an iPad survey. Raw inter-beat interval (IBI) data was analyzed with Kubios software.

Results

Multiple regression analyses were non-significant. The strongest correlations were between high frequency power (HFP) and current pain, $r(10) = .617, p=.052$ and low frequency power (LFP) and current pain, $r(10) = .568, p=.069$. Root mean squared successive differences (RMSSD) (35.05, $sd = 19.98$), LFP (1598.49, $sd = 17.97$), HFP (488.46, $sd = 633.79$), LF/HF ratio (3.22, $sd = 1.31$) and total Pain Catastrophization Scale (PCS) scores (10.33, $sd = 10.89$) demonstrated wide variance, while current (2.83, $sd = 1.99$) or worst pain intensity (7.25, $sd = 1.55$) appeared to be more uniform.



<https://thehealthcaretechnologyreport.com/wp-content/uploads/2021/04/Smart-Speaker-Technology.png>

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Figures 1-3: Range of scores for pain intensity (current and worst), pain catastrophization, and HRV (high and low frequency power).

Discussion & Conclusions

The wide variance of HRV and PCS scores yet similar pain intensity in this small population suggests a subset of individuals that may demonstrate decreased HRV in earlier stages of pain. Future research may focus on broadening the size and diversity of the sample and exploring additional psychosocial variables influencing HRV in acute pain.

