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Autonomic Nervous System Changes In Individuals With Chronic Pain: A Systematic Review Of The Literature

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A SYSTEMATIC REVIEW OF THE LITERATURE

School of Physical Therapy

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BACKGROUND:

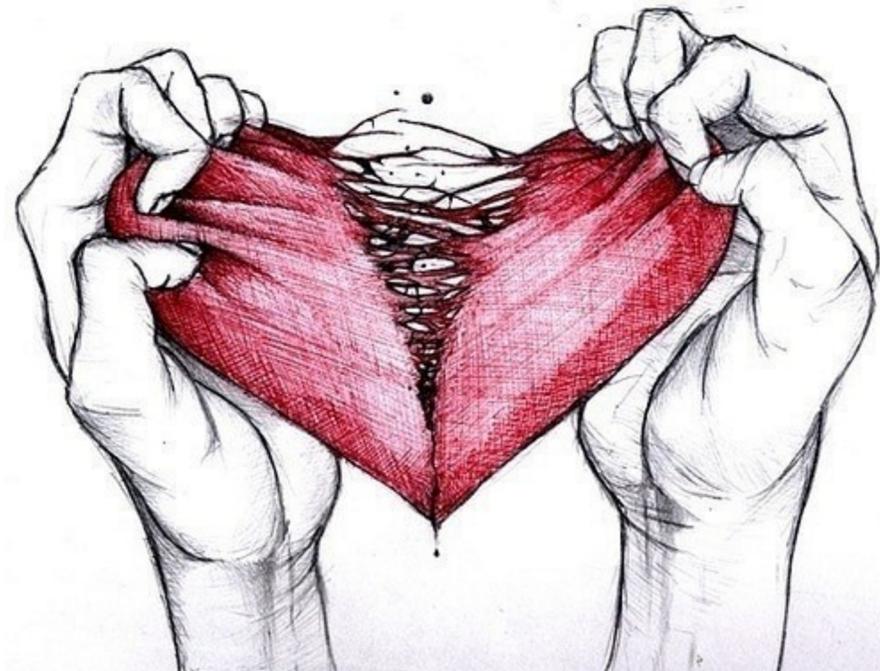
Treatment of chronic pain has placed enormous economic burden on the global healthcare system. Autonomic nervous system (ANS) dysregulation is suggested to be a biomarker of stress and overall health, and is correlated to chronic pain.^{1, 2, 3} One measure of ANS dysregulation is heart rate variability (HRV), and decreased HRV can strongly and independently predict adverse future prognosis in a variety of pathological conditions.⁴ While an association between HRV and all-cause mortality has been demonstrated, inexpensive and quicker measurements of heart rate (HR) and blood pressure (BP) have been less investigated.

RESULTS:

A collection of randomized control trials, meta-analyses, clinical trials, and observational cohort, cross-sectional, and prospective studies using HR and/or BP as primary outcomes found differences in HR and BP measurements between individuals ages 26-69 without chronic pain conditions and those with various chronic pain conditions including the following: chronic low back, neck, pelvis, knee, bladder, and temporomandibular pain, chronic tension-type headache, fibromyalgia syndrome (FM), complex regional pain syndrome, chronic widespread pain, chronic fatigue syndrome, chronic irritable bowel syndrome, persistent postoperative pain, and non-specific chronic pain. These differences varied in their significance and were found in various states including at rest, during physical activity, during psychological or physical stress tests, or before and after specific interventions.

PURPOSE:

The aim of this review was to investigate the relationship between heart rate (HR) or blood pressure (BP) and chronic pain conditions.

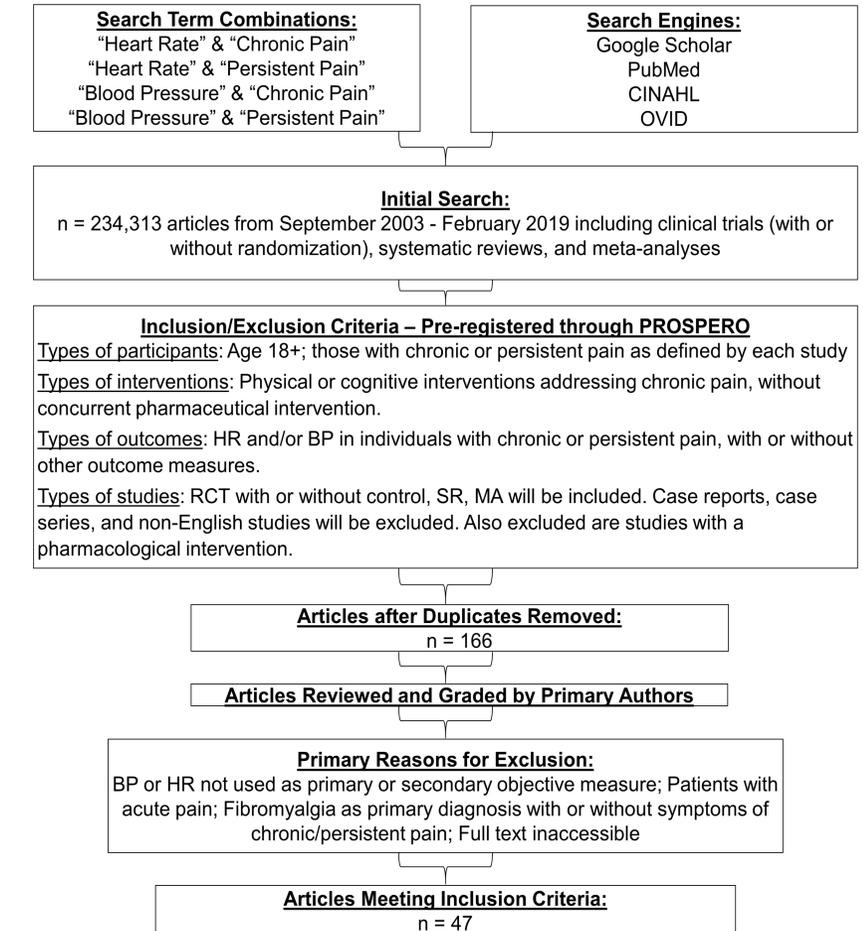


CONCLUSIONS:

Differences in HR and BP exist in individuals with chronic pain conditions compared to healthy, age-matched controls, which may be indicative of ANS dysregulation.

Further research is needed to determine if HR and BP are valid measures of ANS dysregulation in individuals with chronic pain conditions.

METHODS:



DISCUSSION:

HR and BP are quicker and more cost-effective measurements compared to HRV, and if they validly measure ANS dysregulation, may provide insight into the future prognosis of individuals with chronic pain conditions. This research is intended to serve as a foundation for future research exploring the following:

- Efficacy of using HR and BP as measures of ANS dysregulation
- Effectiveness of treatment interventions targeted at decreasing ANS dysregulation as a means of treating chronic pain conditions

