

# Assessing Mood and Energy through the Circumplex Model of Affect in Pelvic Pain Disorders

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## Introduction

- As of now, it is undetermined if autonomically associated brain changes (mood and energy) would be demonstrated to link to autonomic physiology.
- Within this study, two pelvic pain disorders were analyzed: Bladder Pain Syndrome (BPS) and Myofascial Pelvic Pain (MPP). Bladder Pain Syndrome (BPS) displays a loss of vagal function, a nerve in the parasympathetic nervous system, while Myofascial Pelvic Pain (MPP) displays a loss of sympathetic function.
- Thus, if there are differences in mood and energy levels between healthy control patients and patients with these pelvic disorders, it can be inferred that a link between emotional state and the autonomic nervous system exists.

Purpose of Study: To assess the correlation between mood, energy, and pelvic pain diagnosis

## Abstract

This study assesses mood and energy levels through the Circumplex Model of Affect in women with Myofascial Pelvic Pain and Interstitial Cystitis/Bladder Pain Syndrome. Bladder Pain Syndrome (BPS) seems to display loss of vagal function, a nerve in the parasympathetic nervous system, while Myofascial Pelvic Pain (MPP) displays a loss of sympathetic function. Therefore, if a relation is shown between mood and energy in patients with MPP (loss of sympathetic function) and BPS (loss of parasympathetic function), it displays a connection between mood, energy, and the autonomic nervous system. This would be the first time that autonomically associated brain changes (mood and energy) would be demonstrated to link to autonomic physiology. Our data analysis uses data from a 2017-2022 study, which assesses 24 hour Heart Rate Variability (HRV), pain levels, and daily flare occurrences in women with MPP or BPS using Ecological Momentary Assessment Methodologies. Using this data, each question within the survey was given a specific weighting in order to determine a subject's arousal (energy) and valence (mood) levels, which was then applied using the Circumplex Model of Affect in order to identify an individual's disposition in the first week, the 24th week, and the change between the two. Once determined, T-tests were run to analyze correlations between the pelvic disorders, mood, and energy levels.

We found that there were no clear differences between the two pelvic pain diagnoses regarding each aspect of the Circumplex Model (arousal or valence). Preliminary observations suggest that healthy control subjects may differ from Bladder Pain Syndrome subjects and Myofascial Pelvic Pain subjects in the first week regarding negative mood levels, but not in the last week. These observations require confirmation using more advanced statistical evaluations.

## Methods

- Our data analysis uses data from a 2017-22 study, ICECAN, which observes Heart Rate Variability (HRV), pain levels, and arousal and valence of women with MPP and BPS using Ecological Momentary Assessment (EMA) Methodologies.
- EMA is an advanced method wherein real-time data is collected from participants' natural environments. Within the 2017 study, these women answered 15 questions every 85 minutes, for 24 weeks, about their pain levels, energy, and emotional state.
- Utilized the Circumplex Model of Affect which splits emotions into four quadrants: high positive arousal, high negative arousal, low positive arousal, low negative arousal. Participant questions asked about different emotions on a scale of 1-5 and these emotions were categorized into the four different quadrants. Once categorized, the average of all scores within each quadrant were taken to get quadrant value.

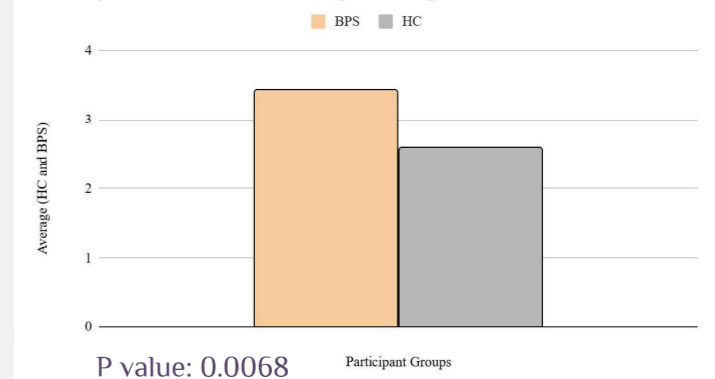


## Conclusion

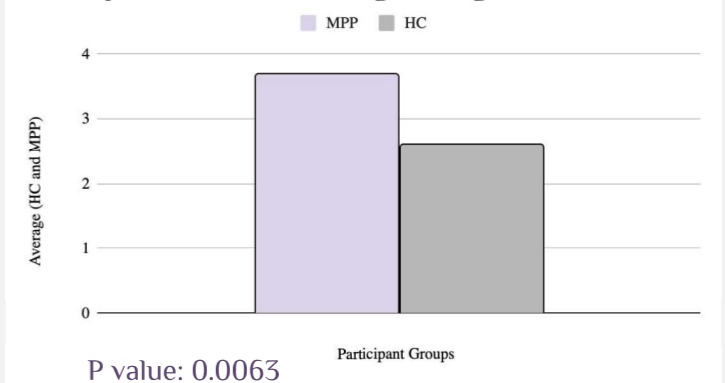
We found that there were no major differences between the two pelvic pain diagnoses regarding each aspect of the Circumplex Model (arousal or valence). However, when analyzing the arousal/valence in Healthy Control, BPS, and MPP subjects, preliminary observations suggest that healthy control subjects may differ from Bladder Pain Syndrome subjects and Myofascial Pelvic Pain subjects in the first week regarding negative mood levels, but not in the last week. This was proven as our results returned p-values of less than 0.05, suggesting that there is a statistically significant difference between the pelvic disorder groups and healthy control group concerning negative mood. However, in order to finalize this result, observations require confirmation using more advanced statistical evaluations.

## Results

Healthy Control and BPS Average for Negative Mood Week 1



Healthy Control and MPP Average for Negative Mood Week 1



## Acknowledgements

Special Thanks to Dr. Thomas Chelimsky, Benjamin Ginsberg, Radina Lilova, Dr. Marcellus M Merritt, Anaya Surve, our former MSIP mentor, Elena and Mabilia, our current mentors, the MSIP team, and the Autonomics Research Team (Gisela, Madison, Bhakti, and Natalie) for their support.