

Fall 2023

Is There a Relationship Between Lived Discrimination and Chronic Pain? - A Pilot Study

Jordan Taylor Kasube SPT
University of Puget Sound

Erin P. O'Neill SPT
University of Puget Sound

Sean White SPT
University of Puget Sound

Karin Steere DPT, PhD
University of Puget Sound

Follow this and additional works at: <https://soundideas.pugetsound.edu/ptsymposium>



Part of the [Physical Therapy Commons](#)

Recommended Citation

Kasube, Jordan Taylor SPT; O'Neill, Erin P. SPT; White, Sean SPT; and Steere, Karin DPT, PhD, "Is There a Relationship Between Lived Discrimination and Chronic Pain? - A Pilot Study" (2023). *Physical Therapy Research Symposium*. 76.

<https://soundideas.pugetsound.edu/ptsymposium/76>

This Poster is brought to you for free and open access by the Physical Therapy, School of at Sound Ideas. It has been accepted for inclusion in Physical Therapy Research Symposium by an authorized administrator of Sound Ideas. For more information, please contact soundideas@pugetsound.edu.

IS THERE A RELATIONSHIP BETWEEN LIVED DISCRIMINATION AND CHRONIC PAIN? - A PILOT STUDY

AUTHORS

Karin Steere, DPT, PhD;
Jordan Kasube, SPT;
Erin O'Neill, SPT;
Sean White, SPT

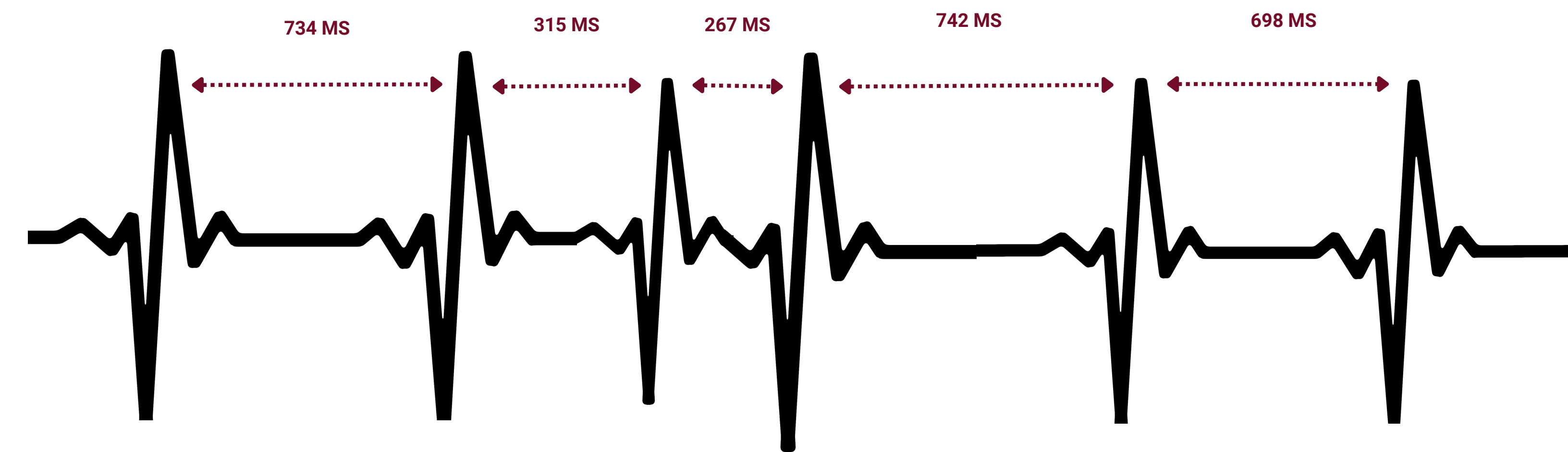


Figure 1. Visual representation of HRV and the variation between successive heartbeats, known as R-R intervals.

BACKGROUND

The complexity of the human experience of pain involves myriad biological, psychological, and social factors, each contributing uniquely to the overall experience. Recent literature illustrates the impact of social determinants on health outcomes, including an association between chronic pain and lived discrimination. Heart rate variability (HRV) is used as a measure of systemic health, with diminished HRV being highly correlated with chronic pain.

PURPOSE

The primary aim of this study is to provide a pilot feasibility protocol to investigate the relationship between lived discrimination and HRV across the spectrum of pain duration.

METHODS

HRV data was collected from 39 participants with a heart rate monitor while seated and taking an iPad survey that encompassed sociodemographic information, pain experience, and the Everyday Discrimination Scale (EDS). HRV data analysis was performed on 37 participants. Pearson's correlation was used to compare total EDS score to HRV.



Figure 4. An individual participating in the study wears a heart rate monitor and completes the EDS survey on an iPad.

RESULTS

Due to the positive skew of EDS and HRV scores, the natural logs of EDS, high frequency power (HFP), and low frequency power (LFP) were utilized. Total natural log EDS (lnEDS) was not correlated with either lnHFP ($r = -.08, p = .637$) or lnLFP ($r = .08, p = .658$).

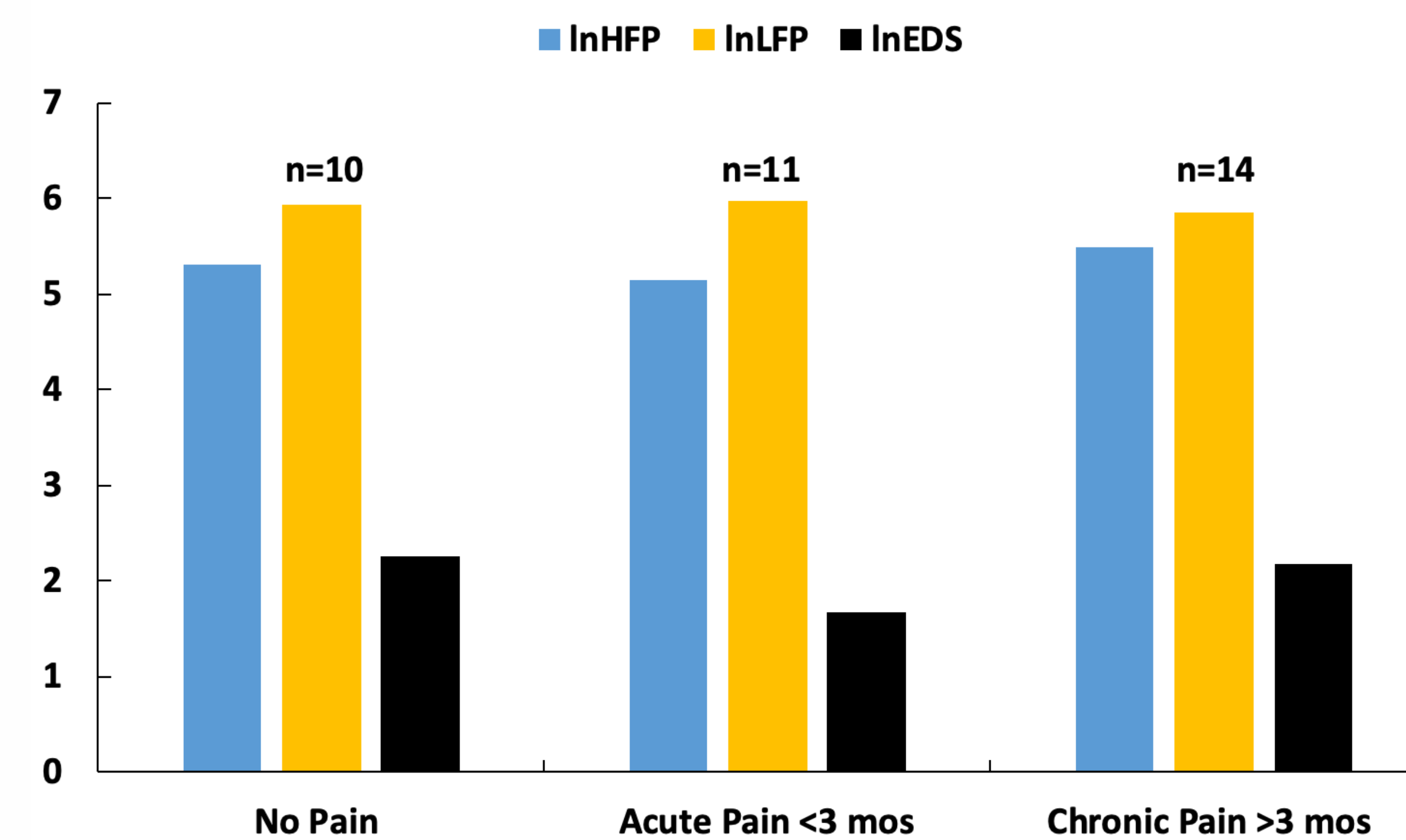


Figure 2. Comparison of mean scores for the natural logs of HFP, LFP, and EDS scores across three subgroups, including no pain, acute pain (<3 mos), and chronic pain (>3 mos).

CONCLUSION

This protocol demonstrates a feasible structure for further exploration of the relationship between lived discrimination and HRV. While nonsignificant in this small sample, the relationship between discrimination and HFP is opposite of LFP, suggesting different relationships between these variables.

DISCUSSION

Lived discrimination is associated with pain intensity, which is related to the development of chronic pain. EDS scores were similar across the three groups, however an inverse relationship between discrimination and HFP compared to LFP was identified. This difference suggests there may be a connection between these variables that remains to be established. The homogeneity and limited size of this sample may be obscuring the influence of HRV variables and lived discrimination as risk factors for developing chronic pain. Future research should investigate the differences in these relationships in a larger sample between groups of those experiencing no pain, acute pain, and chronic pain.

REFERENCES

1. Anisman H, Baines MG, Berczi I, et al. Neuroimmune mechanisms in health and disease: 1. Health. CMAJ. 1996;155(7):867-874.
2. Bambra C, Gibson M, Sowden A, Wright K, Whitehead M, Petticrew M. Tackling the wider social determinants of health and health inequalities: evidence from systematic reviews. J Epidemiol Community Health. 2010;64(4):284-291. doi:10.1136/jech.2008.082743
3. Berenbon RF. Using Rasch analysis to investigate the validity of the Everyday Discrimination Scale in a national sample. J Health Psychol. 2020;25(13-14):2388-2395. doi:10.1177/1359105318800788
4. Gaskin DJ, Richard P. The Economic Costs of Pain in the United States. The Journal of Pain. 2012;13(8):715-724. doi:10.1016/j.jpain.2012.03.009
5. Jay MA, Bendayan R, Cooper R, Muthuri SG. Lifetime socioeconomic circumstances and chronic pain in later adulthood: findings from a British birth cohort study. BMJ Open. 2019;9(3):e024250. doi:10.1136/bmjopen-2018-024250
6. Koenig J, Kooning MD, Bernardi A, et al. Lower Resting State Heart Rate Variability Relates to High Pain Catastrophizing in Patients with Chronic Whiplash-Associated Disorders and Healthy Controls. Pain Practice. 2016;16(8):1048-1053. doi:10.1111/papr.12399
7. Steglitz J, Buscemi J, Ferguson MJ. The future of pain research, education, and treatment: a summary of the IOM report "Relieving pain in America: a blueprint for transforming prevention, care, education, and research." Transl Behav Med. 2012;2(1):6-8. doi:10.1007/s13142-012-0110-2
8. Sturgeon JA, Ziadni MS, Trost Z, Darnall BD, Mackey SC. Pain catastrophizing, perceived injustice, and pain intensity impair life satisfaction through differential patterns of physical and psychological disruption. Scandinavian Journal of Pain. 2017;17(1):390-396. doi:10.1016/j.sjpain.2017.09.020
9. Thayer JF, Åhs F, Fredrikson M, Sollers JJ, Wager TD. A meta-analysis of heart rate variability and neuroimaging studies: Implications for heart rate variability as a marker of stress and health. Neuroscience & Biobehavioral Reviews. 2012;36(2):747-756. doi:10.1016/j.neubiorev.2011.11.009
10. Tracy LM, Ioannou L, Baker KS, Gibson SJ, Georgiou-Karistianis N, Giummarra MJ. Meta-analytic evidence for decreased heart rate variability in chronic pain implicating parasympathetic nervous system dysregulation: PAIN. 2016;157(1):7-29. doi:10.1097/j.pain.0000000000000360

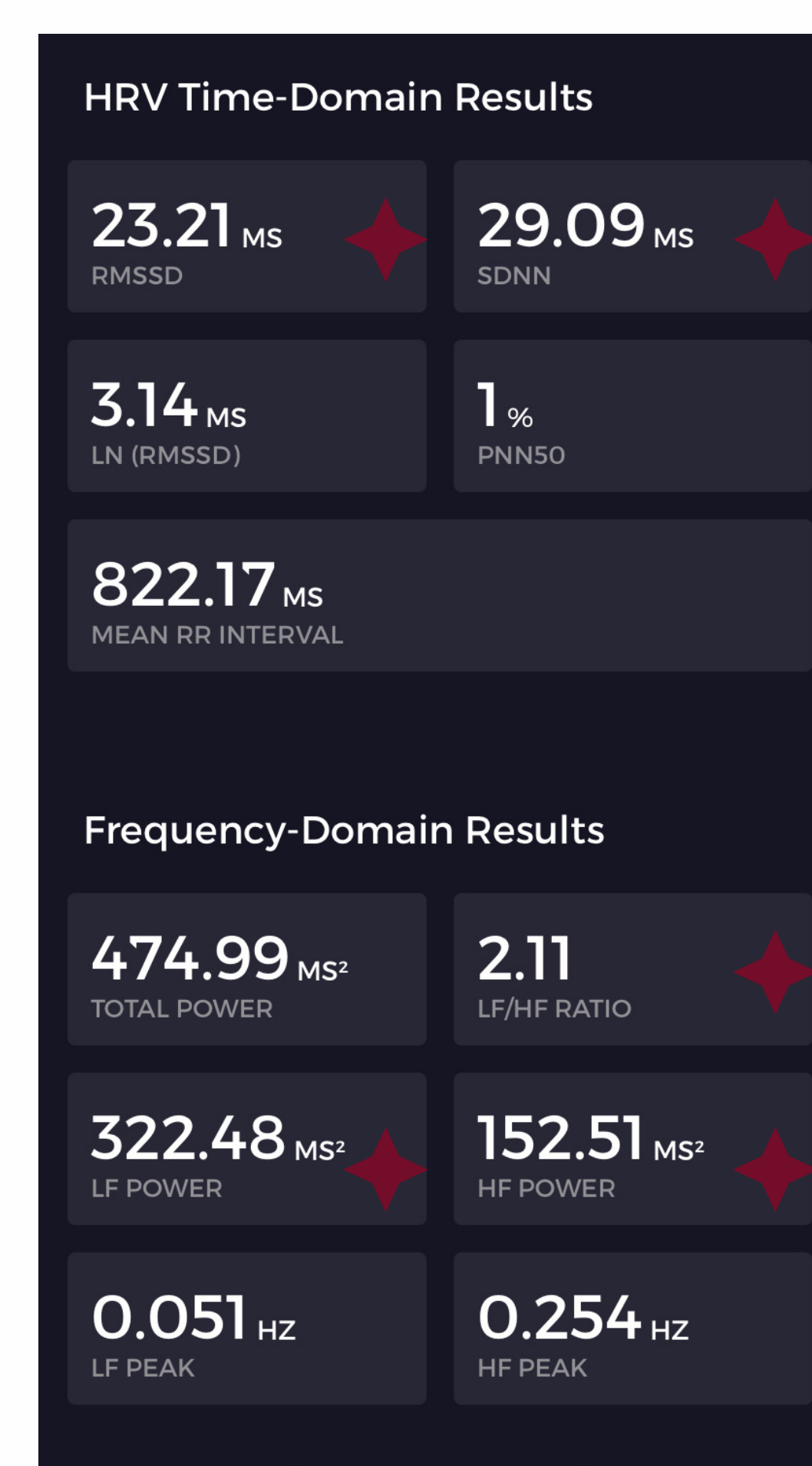


Figure 3. A screenshot of an example of data that was collected via Elite HRV.

◆ HRV Variable Definitions:

RMSSD: The root mean square of successive differences between normal heartbeats. Measured in milliseconds.

SDNN: The standard deviations of the normal-to-normal (NN) intervals for each interbeat interval. Measured in milliseconds.

LFP: The frequency activity in the 0.04-0.15Hz range.

HFP: The frequency activity in the 0.15-0.40Hz range.

LF/HF Ratio: The ratio between LFP and HFP may be indicative of Sympathetic activity relative to the Parasympathetic Autonomic Balance.