

Feasability and Limited Efficacy of a Tandem Cycling Community Exercise Program on Physiological Health, Functional Health, Therapeutic Relationships, and Quality of Life in Persons and Care Partners affected by Parkinson's Disease

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Background

The inclusion of regular exercise in the management of Parkinson's Disease (PD) has increased drastically over recent years as a plethora of studies have demonstrated significant improvements in both motor function and mobility in individuals with PD.¹ Further exploration into the effects of different types of exercise has revealed that forced exercise (FE) is ideal for PD patients given that it allows them to achieve a higher intensity of exercise than they could on their own.² One of the most effective kinds of FE is stationary tandem cycling, an intervention in which a physical trainer will share a tandem cycle with a PD patient, thereby forcing the pace and facilitating a higher pedaling rate. An element that has not been implemented in these studies, however, is the inclusion of the PD patient's respective care partner. While PD management focuses primarily on the patient, it is also important to involve the patient's care partner as they are heavily involved in disease management outside of the clinical setting. To put this into practice, we developed an 8-week FE program in which PD patients and their respective care partners will share a tandem cycle and engage in exercise sessions together.

Methods

10 PD patient/care partner dyads will undergo an 8-week, community-based, virtual reality tandem cycling program.

Physiological Function: Timed Get-up and Go (TUG) test, 10 Meter Gait Speed, Functional Gait Assessment (FGA), Unified Parkinson Disease Rating Scale (UPDRS), and Hoehn & Yahr score

Physiological Health: Heart Rate Variability (SDNN), Sleep Quality (PNS index, SNS index, SDNN, SI, pNN50, RMSSD), Stress Response (PNS index, SNS index, SDNN, SI, RMSSD), and Resiliency Status (pNN50, RMSSD)

Psychosocial Health and QOL: Parkinson's Disease Quality of Life Measurement System (PD-QOL), Patient Reported Outcomes Measurement Information System (PROMIS), Montreal Cognitive Assessment (MoCA), Brief COPE Questionnaire, Brief Geriatric Depression Scale (GDS), Generalized Anxiety Disorder survey (GAD-7), and Brief Resilience Scale (BRS)

Therapeutic relationships: Dyadic Relationship Scale

Anticipated Results

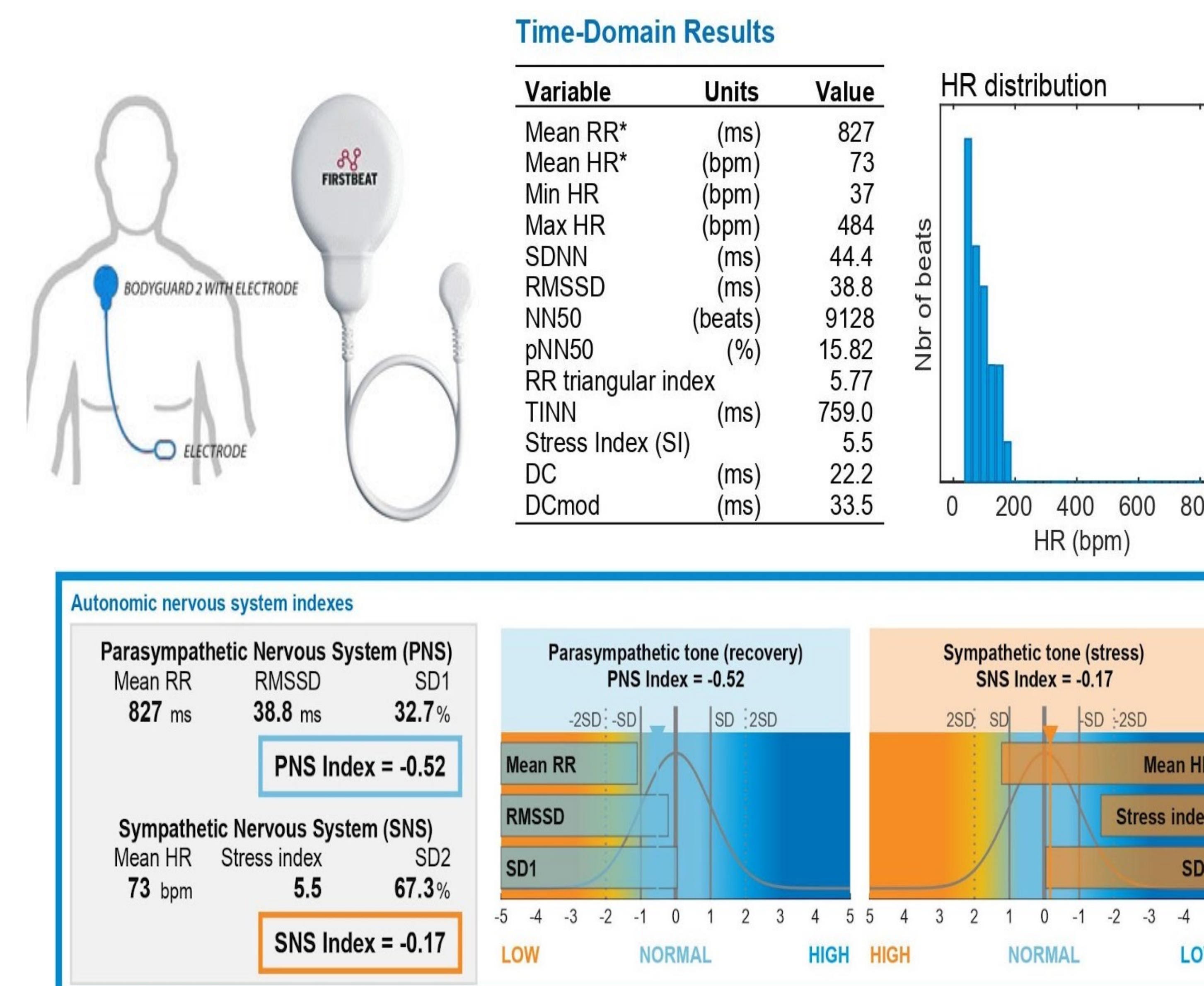
We hypothesize that physiological health, psychosocial health, QOL, and interpersonal relationships will improve in our PD patients and care partners, as well physiological function in our PD patients, after completing the tandem cycling intervention.

Physiological Function Metrics: TUG (will decrease), 10m gait speed (will decrease), FGA score (will increase), UPDRS, Hoehn & Yahr

BodyGuard FirstBeat Metrics: SDNN (will increase), RMSSD (will increase), pNN50 (will increase), SI (will decrease), PNS index to SNS index ratio (will increase)

Psychosocial Health and QOL Metrics: PD-QOL (will improve), PROMIS (will improve), MoCA (will increase), Brief COPE (less "Avoidant" coping), Brief GDS (will decrease), GAD-7 (will decrease), BRS (will increase)

Therapeutic Relationship Metrics: Dyadic Relationship Scale (will increase)



Discussion

By implementing an exercise intervention that prioritizes psychosocial elements in addition to physiological ones, a broader range of benefits may be achieved for individuals with PD and their respective care partners. This study will provide information on both the practicality and effectiveness of a tandem cycling program involving both PD patients and their respective care partners in order to inform future studies and determine if such a program likely to benefit a larger population sample.



Greenville Cycling and Multisport

References

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2. Stuckenschneider, T., Helmich, I., Raabe-Oetker, A., Frobose, I., & Feodoroff, B. (2015). Active assistive forced exercise provides long-term improvement to gait velocity and stride length in patients bilaterally affected by Parkinson's disease. *Gait & Posture*, (42)4, 485-90. doi: 10.1016/j.gaitpost.2015.08.001.