AAN 76th ANNUAL MEETING ABSTRACT

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Abstract Title: Functional and Cognitive Benefits of a Community Tandem Cycling Exercise Intervention on Patients with Parkinson's Disease and their Care Partners

Press Release Title: Tandem Cycling Linked to Improved Health for Those with Parkinson's, Care Partners

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Objective: To investigate the feasibility, limited efficacy, therapeutic partnerships, and physical effects of a VR tandem cycling program on Parkinson's disease dyads.

Background: Aerobic exercise programs demonstrate symptom improvements in PD patients; however, incorporating care partners (i.e. PD dyads) into a community-based, virtual reality (VR) cycling program with PD patients remains uninvestigated.

Design/Methods: Upon Prisma Health Institutional Review Board approval, PD dyads were screened for eligibility by movement disorders neurologists. Pre-testing measures for PD dyads (n=9) involved emotional and cognitive status questionnaires including the Brief Resiliency Scale (BRS), the Geriatric Depression Scale Short Form (GDS-SF), and the Parkinson's Disease Questionnaire-39 (PDQ-39). The Unified Parkinson's Disease Rating Scale (UDPRS) and 10-meter gait speed test were administered to assess PD patients' physical function. PD dyads tandem cycled for 8 weeks, two times/week, 15 to 45 minutes/session. Post-testing measures occurred 48 hours after the last session. Paired t-tests were conducted for statistical significance at $p<0.05$. Due to the research design being a pilot study, changes from pre-testing are reported using the standard error of the mean (SEM).

Results: Post-intervention, care partners demonstrated individual improvements in overall resiliency via the BRS and statistically significant improvements in depression scores via the GDS-SF. PD patients demonstrated a minimal clinically important difference in the overall PDQ-39 score (-4.71, SEM=3.93, 95% CI=[-14.02, 4.59], p=0.27) post-intervention, with a significant improvement in the mobility dimension (-13.61, SEM=4.49, 95% CI=[-23.96,-3.26], p=0.02). PD patients' total UDPRS scores significantly decreased (-7.38, SEM=1.28, 95% CI=[-10.40,-4.35], $p<0.01$) from pre-testing to post-testing. PD patients' 10-meter gait speeds significantly improved (+0.27 m/s, SEM=0.06, 95% CI=[0.14,0.4], $p<0.01$) post-intervention.

Conclusions: The findings from this pilot study suggest that a PD dyad tandem cycling program may improve the overall health and well-being of both PD patients and their care partners. Future studies should be conducted with larger cohorts of participants to further explore the effectiveness of a tandem cycling intervention in PD dyads.

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