

**Title: Enhanced walking function with boxing training for persons with Parkinson disease**

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**Abstract:**

**Objective:** The purpose of this preliminary study was to compare walking function outcomes over time between people with PD who participate in boxing training and those who do not.

**Methods:** Eighty-eight participants with PD were enrolled in a 2-year longitudinal cohort study. Participants who completed all testing at baseline, 6, and 12 months were included in the current analysis [n=65; mean age 67.1(8.7) years; male 71%; mean months post diagnosis 71.8(55.4), mean Hoehn and Yahr 1.75]. Participants were categorized as “boxer” if at each testing session they reported participating in boxing training (n=39) or as “non-boxer” if at each testing session they reported participating in other exercise activities (n=26). Demographics and PD characteristics were collected at baseline. Exercise behaviors and walking function were collected at each testing session. Walking variables included the comfortable and fast 10-meter walk tests and the 6-minute walk test. Data were analyzed with a 2x3 mixed-model ANOVA ( $p < 0.05$ ). **Results:** Groups did not significantly differ in age, gender, month since diagnosis, Hoehn & Yahr levels, or self-reported readiness to exercise ( $p > .05$ ). Boxers demonstrated significantly greater comfortable 10-meter walking speed compared to non-boxers [mean speed, boxers 1.29(0.23)m/s vs. non-boxers 1.18(0.24)m/s;  $p = .048$ ] and increased gait endurance on the 6-minute walk test [mean distance, boxers 503.5(120.3)meters vs. non-boxers 433.5(108.0)meters;  $p = .012$ ]. Significant differences in fast walking speed were not found between groups. Neither group demonstrated significant changes in walking function over the 12-month period. Boxers reported significantly more minutes of exercise per week ( $p = .007$ ) and a higher rate of perceived exertion during exercise ( $p = .002$ ) than non-boxers. **Conclusion:** Those who participated in boxing training maintained better walking function over the course of one year than those who did not box. Future study of persons with PD is warranted to determine the effectiveness of boxing on both overall fitness and PD symptoms.