Mind and Body: Impact of an Eight-Week Community Taekwondo Training Program in Individuals with Chronic Acquired Brain Injury

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Background

- Survivors of brain injury often have long term physical and cognitive deficits (1,2).
- Exercise is beneficial to both physical and cognitive health (3,4).
- Many individuals with brain injury have limited access to community resources and adapted fitness programs, or may not be motivated or engaged by these activities.
- Certain styles of martial arts have been used in practice for individuals with neurologic deficits (5–7) (e.g., tai chi or qigong) however the “hard” style of taekwondo has not yet been explored in this population.

Explore the impact and feasibility of an eight-week community-based taekwondo program on aspects of cognition, occupational performance, and balance in individuals with chronic brain injury.

Methods

Participants
- 8 males recruited from a rehabilitation facility in the Northeastern USA
- Average age 38.9 years
- Average time since injury 8.3 years

Intervention
- 60-minute classes, 3 times per week, over 8 weeks
- Modifications (e.g., poles) were used for physical support as needed
- Volunteers provided assistance as needed
- Participants required to attend at least 18 classes
- Measures administered at baseline (pre) and within 72 hours of final taekwondo class (post)

Inclusion Criteria
- Community dwelling individuals
- Over 18 years old
- Primary diagnosis of a psychiatric disorder
- Presence of neurodegenerative disorder
- Presence of medical condition(s) that contraindicate exercise
- Determined via physician’s clearance
- Independent or supervision with ambulation and no more than a unilateral assistive device
- English speaking
- Able to follow at least 2-step instructions
- Physician clearance to participate

Conclusions and Future Directions

- TKD is safe and feasible as a community intervention for individuals with chronic brain injury.
- Results demonstrated a significant improvements in attention and balance following a relatively brief training program.
- No change found in self perception of performance and satisfaction with daily tasks.
- Future directions should include investigations of:
  - Long term training in taekwondo
  - Additional cognitive, emotional/behavioral, and motor metrics to better understand the impact of these gains on function, quality of life, and community engagement.
  - The effect on social interactions and self-efficacy.
  - The impact of exercise intensity on functional gains.

Key Clinical Message

Taekwondo is a dynamic intervention that can safely engage individuals with chronic brain injury and can positively impact aspects of attention and balance.

Outcome Measures

- Mini Best: Anticipatory and reactive balance, sensory organization, dynamic gait.
- COPM: Changes in self perceived performance and satisfaction with everyday activities (self-care, productivity and leisure).
- Conners Continuous Performance Test, 3rd Edition (CPT3): Sustained attention, includes measures of perseveration, omissions, commissions/impulsivity, reaction time, and performance change over time.
- Falls per session: Number of times a participant inadvertently came to rest on the floor or another object, includes assisted falls.

COPM Subscale Baseline Mean SD Post-Intervention Mean SD p-value
- Performance 6.06 ± 1.08 6.67 ± 2.14 0.17
- Satisfaction 6.52 ± 1.88 7.05 ± 2.20 0.21

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