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[3, 4].
- **Exercise is beneficial to both physical and cognitive health** [1, 6]
- 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[2, 5] (e.g., tai chi or qigong) however **the "hard" style of taekwondo has not yet been explored in this population**.

Purpose

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

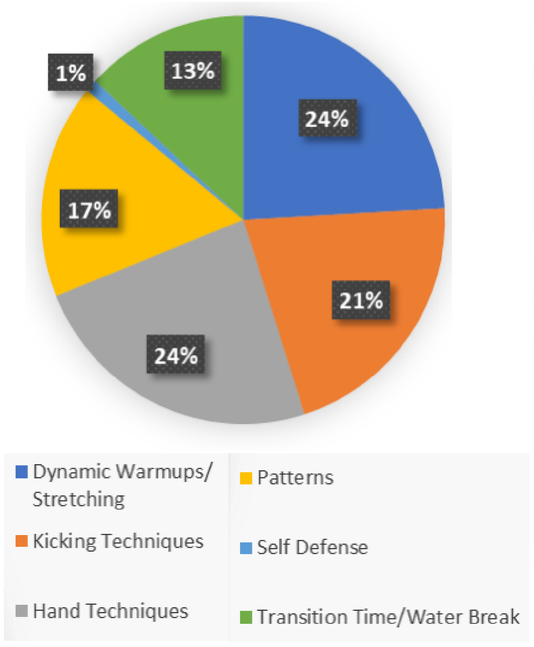
Participants

- 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)

AVGERAGE CLASS BREAKDOWN



Inclusion Criteria	Exclusion Criteria
Community dwelling individuals	Primary diagnosis of a psychiatric disorder
Over 18 years old	Presence of neurodegenerative disorder
ABI or TBI at least 6 months prior to study	Presence of medical condition(s) that contraindicate exercise
Primary mode of mobility is ambulation	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	

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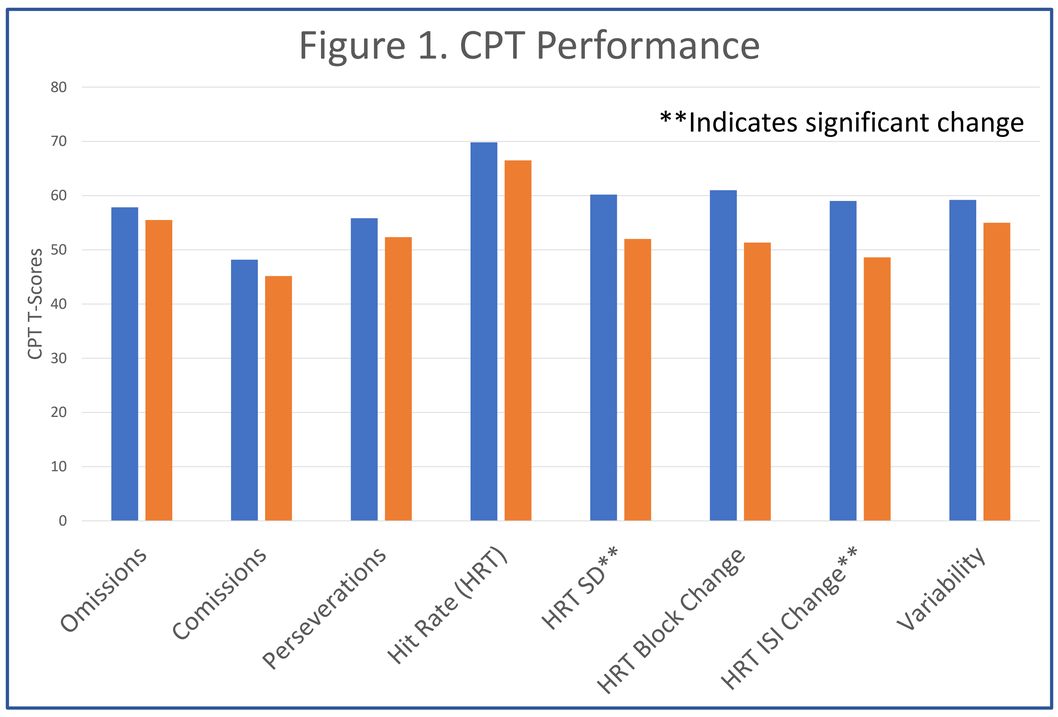
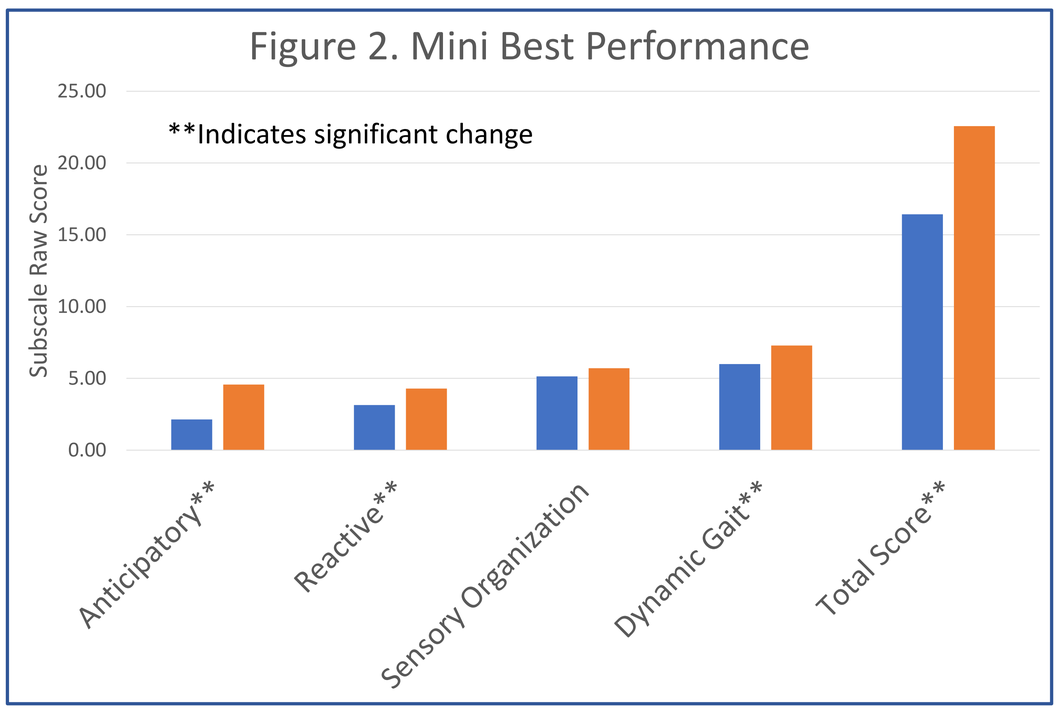
Outcome Measures	Domain Assessed
Mini Best	Anticipatory and reactive balance, sensory organization, dynamic gait.
COPM	Changes in self perceived performance and satisfaction with everyday activities (self-care, productivity and leisure).
Conners Continuous Performance Test, 3rd Edition (CPT3)	Sustained 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.

Results





- Safety:
  - 5 falls total (2 individuals)
  - No injuries
- Qualitative improvements noted by care team and families:
  - Initiation and alertness in rehabilitation therapies
  - Social engagement with peers at day programming
  - Motivation for learning
  - Balance, memory, mood, and engagement

COPM Subscale	Baseline		Post-Intervention		*p*-value
	Mean	SD	Mean	SD	
Performance	6.06	1.08	6.67	2.14	0.17
Satisfaction	6.52	1.88	7.05	2.10	0.21

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.

Acknowledgements & References

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