Improving Attention in TBI Rehabilitation

The impact of Dual Task Training on Cognitive Focus and Physical Performance

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INTRODUCTION

Nuero-Fit is a program that specializes in designing individualized exercise programs to support individuals living with a brain injury or other neurological disorders.

A Traumatic Brain Injury (TBI) often results in impaired attention, decreased cognitive flexibility, and reduced engagement in rehabilitation settings (Wei, 2024). Cognitive challenges such as distractibility and poor focus have been hindering progress in physical recovery. Dual Task Training, which involves performing a physical and a cognitive task simultaneously, have emerged as a promising method to promote neuroplasticity and improve attentional control.

INTERNSHIP PROJECT OBJECTIVE

The objective of this project was to determine if dual-tasking benefits or takes away focus from individuals who have had a TBI or stroke.

RELATED LITERATURE

Li et al. (2024) conducted a multi-diagnosis control study evaluating a motor- cognitive dual-task training program in 95 adults with neurological conditions, including 23 individuals with TBI. Participants completed a 5-week regimen combining balance/walking tasks with cognitive challenges. The results showed that dual tasking significantly improved balance, gait speed, walking endurance, and reduced fall risk across the sample.

Pedullà et al. (2020) developed the DIDA-Q to measure how people with neurological conditions experience difficulties with dual-tasking in daily life. It found that dual-task challenges significantly affect everyday function, supporting their use in rehab to target attention and multitasking deficits.

ACKNOWLEDGMENTS

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MATERIALS & METHODS

Adults with neurological impairments (TBI or stroke) participating in a community-based neurorehabilitation program called Nuero-Fit helped with this study.

Participants completed 30–45 minute sessions involving dual-task exercises combining physical movement with cognitive challenges. Activities were adapted to individual ability levels.

Dual-Task Activities:

Standing

- Walk while counting backwards
- Step over cones while naming animals
- Stroop test balancing on one foot

Seated

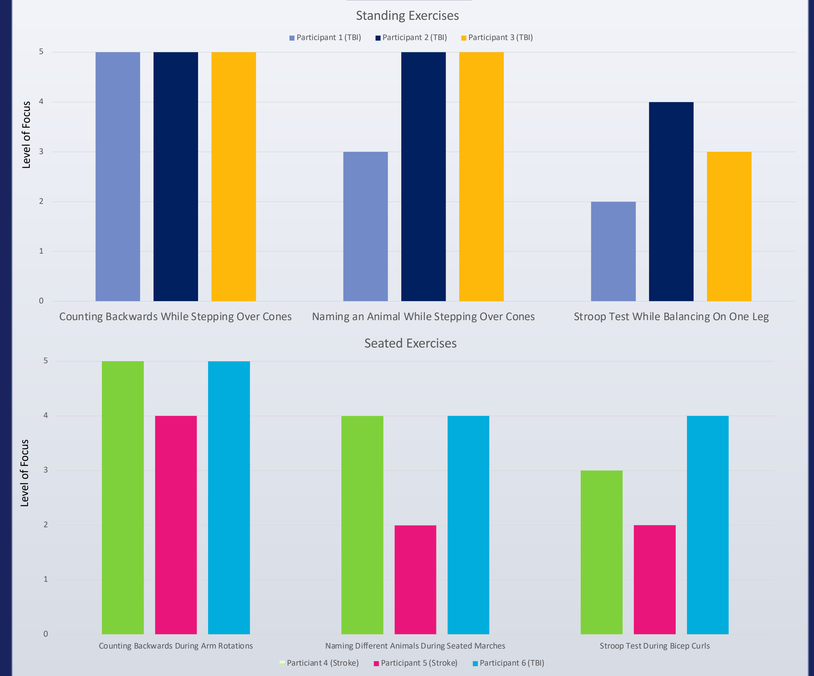
- Counting backwards during arm rotations
- Name animals during alternating marches
- Stroop test holding weight in air

Materials:

- Cones
- Dumbbells
- Resistance bands
- Chairs
- Timers
- Verbal prompts

Data were collected using qualitative observations and a standardized 1–5 rating scale. Observations focused on three key areas: participant engagement (e.g., focus, motivation), task performance (e.g., accuracy, ability to complete dual-tasks), and the type and frequency of redirection required to sustain attention or complete tasks. A score of 1 indicated minimal focus and inability to complete the task, while a score of 5 reflected full task completion with sustained attention and no need for redirection. This scale was used to assess how effectively participants performed while engaged in dual-task activities.

RESULTS



CONCLUSIONS

Participants with neurological impairments were able to engage in dual-task exercises with varying levels of success. Tasks that combined physical and cognitive components revealed differences in focus, task completion, and redirection needs. Overall, dual-tasking appeared to enhance engagement and provided insight into each participant's attentional abilities, suggesting potential benefits for personalized neurorehabilitation strategies.

REFERENCES

Li, T.-Q, Markovic, G, & Persson, H. (2024). Changes in functional connectivity following intensive attention training in patients with traumatic brain injury: A pilot study. *Journal of Rehabilitation Medicine – Clinical Communications, 7*, Article 12436. https://doi.org/10.2340/jrmcc.v7.12436.

Pedullà, L., Podda, J., & Tacchino, A., (2020). The patients' perspective on the perceived difficulties of dual-tasking: Development and validation of the Dual-task Impact on Daily-living Activities Questionnaire. *Multiple Sclerosis Journa*l, 26. https://www.msard-journal.com/article/S2211-0348(20)30675-1/fulltext

Wei, Y.-C., Chen, C.-K., Lin, C., Shyu, Y.-C., & Chen, P.-Y. (2024). Life after traumatic brain injury: Effects on the lifestyle and quality of life of community-dwelling patients. *Neurotrauma Reports, 5*(1), 159–171. https://pmc.ncbi.nlm.nih.gov/articles/PMC10924056/?utm_source=chatgpt.com.