

Title:

Outcomes, supports and barriers related to intensive exercise participation for adults with chronic moderate to severe acquired brain injury

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Abstract:**Background and Purpose**

Effects of high-intensity group exercise on the endurance, advanced mobility, and gait speed of adults with chronic severe acquired brain injury (ABI) living in brain injury group homes were investigated. In a subsequent qualitative study, supports and barriers related to participation in exercise from the perspectives of participants, residential staff and family members were investigated.

Participants

Fourteen adults with chronic severe ABI in supported independent living who could stand with minimal or no assist and walk with or without ambulation device were studied. Initially, eight presented with low ambulatory status, six with high ambulatory status. Interviews were conducted with all 14 intervention subjects, one person who dropped out, four family members and four residential staff.

Methods

Participants received a 6-week high-intensity exercise group intervention for 60-90 minutes, 3 days per week assisted by personal trainers under physical therapist supervision. Measures (6 Minute Walk Test, High-level Mobility Assessment Tool, and 10 Meter Walk Test) were collected at baseline, post-intervention, and 6 weeks later. Analysis included repeated measures T test and the Wilcoxon Signed Ranks Test. The qualitative study involved a brief survey and semi-structured interviews, conducted 2-6 months after the intervention, audio recorded and transcribed verbatim. Analysis used pre-existing and emerging codes (concepts), and data were double coded using qualitative data analysis software (atlas.ti).

Results

Significant post-intervention group improvements were achieved on all three outcome measures (6 MWT, HiMAT, and 10MWT) and greater than the minimal detectable change (MDC) for this population. 10MWT outcomes indicate that three participants transitioned from low to high ambulatory status and maintained the change six weeks later. Qualitative findings identified environmental and personal barriers and supports. Environmental barriers to participation included transportation (inconsistent, delayed), group format (not always person-centered), and negative family attitudes towards programming developed in-house. Personal barriers to participation were physical (vision, balance, incontinence), cognitive (memory, executive function, lack of self-awareness), behavioral (anxiety), and tendency toward a sedentary lifestyle (watching television). Environmental barriers to being physically active between exercise sessions included: staff fear for participant safety, broken outdoors equipment, and lack of access to supportive affordable fitness opportunities for this population. Environmental and personal supports for participation included enthusiasm of trainers, group format (encouraged mutual

support), investments in transportation, pre-injury participation in sports, and motivation to do something meaningful that involved interacting with others.

Discussion and Conclusion

People living with chronic ABI can improve endurance, demonstrate ability to do advanced gait, and improve ambulatory status with six weeks of intensive exercise. Challenges to sustainability of exercise programs for people with chronic severe ABI include costs and transportation. Efforts to support better lifestyle choices (improved nutritional choices, increased physical activity between sessions) are needed to enhance functional benefits of the intervention.

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