

Dementia and Technology

People living with dementia co-producing rehabilitation exergame requirements E. Dove, R. Wang, K. Patterson, A. Astell. *Gerontechnology* 25(s)

Purpose People living with dementia are more likely to experience balance impairments compared to older adults without cognitive impairment, which increases their risk of falling [1]. Physical rehabilitation (e.g., exercise programs) can reduce fall risk, but people living with dementia are often excluded from rehabilitation [2]. Exercise video games (i.e., gaming technology used for physical activity, e.g., Nintendo Wii) are enjoyed by people living with dementia and can deliver engaging exercises to this group [3]. To maximize the potential of exergames for delivering rehabilitation to people living with dementia, systems and games that match their needs are required, alongside comprehension of the barriers to physical rehabilitation for this population. This two-part study aimed to co-produce a set of rehabilitation exergame requirements with people living with dementia and explore the factors limiting availability of rehabilitation for this population. **Method.** In Phase 1 (multi-methods study), 32 people living with dementia from adult day programs tested 15 commercial exergames and 3 systems over 6 weeks (e.g., Xbox Kinect bowling), to identify factors that influence game and system accessibility for people living with dementia. Participants' game interactions were captured through video recordings and fieldnotes, with direct feedback captured through immediate post-game interviews, to further contextualize the videos. In Phase 2 (qualitative descriptive study), semi-structured interviews were conducted with 9 family care partners, 8 community care staff, 7 rehabilitation clinicians, and 6 rehabilitation researchers (combined n=30) to understand their perceptions of physical rehabilitation for people with dementia. Data from Phase 1 were analyzed descriptively, with information extracted from the videos including turn duration, and total turns played, declined, and ended early. Fieldnotes and interviews from Phase 1 were analyzed through directed content analysis [4] to identify factors affecting game accessibility. Interview data from Phase 2 were transcribed verbatim, coded by two independent raters, and analyzed using reflexive thematic analysis [6] to identify prevalent themes. **Results and Discussion** People living with dementia from Phase 1 were enthusiastic game testers, providing feedback and insights into the accessibility of existing commercial exergames. Accessibility was determined by interactions of limited cognitive, sensory-perceptual, and motor/physical affordances, hindering the games' ability to accommodate players with different needs. The interviewees in Phase 2 confirmed that there are limited physical rehabilitation interventions for people with dementia. Potential reasons for this unmet need included low expectations of people with dementia's ability to benefit from rehabilitation, risk aversion outweighing potential benefits of rehabilitation, and limitations of current programs, such as lack of engagement, tailoring/adaptation, and challenge. In the absence of existing rehabilitation programs for people living with dementia on which to base exergames, requirements for rehabilitation exergames were derived from the findings from this two-part study (Figure 1). These requirements emphasize the intersection between gameplay affordances, therapeutic challenge (e.g., balancing safety and risk), and the environment. It is hoped that, alongside efforts to raise awareness and tackle low expectations of people living with dementia, these recommendations will stimulate multidisciplinary development of new rehabilitation exergames for this underserved group by highlighting key ingredients for successful interventions.

References

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Keywords: Dementia, rehabilitation, exercise, video games, design

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Acknowledgement The project is funded by doctoral scholarships from the Alzheimer Society of Canada (21-20), AGE-WELL (AW-HQP2020-04, EPIC-AT-2022-F8), and the Canadian Institutes of Health Research (493659).

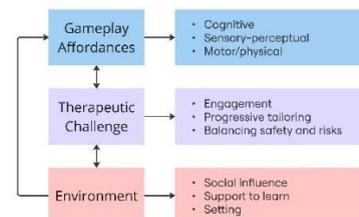


Figure 1: Rehabilitation exergame requirements