Can a group exergaming intervention impact balance, movement confidence, and cognitive function among people with cognitive impairment?

E. Dove & A. Astell

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Purpose Physical activity and exercise offers benefits to people with cognitive impairment (PwCI), including people with dementia or Mild Cognitive Impairment. (Blankevoort et al., 2010). However, many exercise programs for PwCI are passive, unengaging, and repetitive, result-ing in low engagement and poor adherence. (Lee, 2016). Motion-based technologies (MBT) and games are increasingly being used to encourage exercise participation among PwCI, although the impacts are still to be determined. (van Santen et al., 2018). This study aims to examine the impacts of a group MBT intervention on three areas of importance for PwCI, including balance, movement confidence, and cognitive function. **Method** Twenty-four PwCI are being invited to play an Xbox Kinect bowling game in a group setting, twice per week for ten weeks (20 sessions). Pre- and post-bowling group balance is being assessed through the Mini Balance Evaluation Systems Test (Mini-BEST) and cognitive function with the Montreal Cognitive Assessment (MoCA). Video recordings of participants, taken during week one, five, and ten of the intervention, are being used to examine movement confidence (e.g. flow of movement) over time. **Results and Discussion** Quantitative data collected through the Mini-BEST, MoCA, and coded video recordings, are being compared from pre-test to post-test using paired t-tests plus an ANCOVA, to account for continuous variables that are not of primary interest. The exergame intervention has the potential to positively impact participants' physical function, specifically balance (score on the Mini-BEST) and movement confidence (coded from video recordings). This will confirm the feasibility and potential benefits of using MBT to deliver video game-based exercise in-terventions to PwCI. There is also potential for the MBT intervention to positively impact cognitive function of PwCI (as measured through MoCA score). This work can be used as the basis for developing both specific software and future video game-based exercise pro-grams for PwCI.

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Email: erica.dove@mail.utoronto.ca

Figure 1. Players in Action