C0020

Home-Based and Residence-Based Virtual Reality Training to Increase Rehabilitative Exercise in Seniors

Summary

- Regular exercise can help seniors maintain their mobility and independence and decrease their risk of injury.
  - Despite the importance of exercising, seniors often experience challenges to completing regular exercise, including transportation, cost, weather conditions, low motivation, and fear for their safety.
- This project used virtual reality (VR) to help seniors safely, enjoyably, and effectively participate in an exercise program.
- The project team assessed whether using VR would improve strength, balance and gait, and general overall health. These improvements were expected to lead to fewer falls, emergency room (ER) visits, and hospital stays.
- Two separate groups of seniors were recruited – those living in their own home and those living in a long-term care residence.
- Of the 47 seniors who participated in the project, 24 were given 20-30 minutes of VR exercises 3-5 times per week for 8 weeks (intervention group) and 23 were instead instructed to compete their usual exercises for 8 weeks (control group). At the end of the project, outcomes relating to participants' health and physical function were compared between the two groups.
  - 31 long-term care residents (21 females – average age 85 years; 10 males – average age 79 years) were split between the intervention (16 participants) and control groups (15 participants).
  - 16 community-dwelling seniors (11 females – average age 72 years; 5 males – average age 76 years) were separated into intervention and control groups (8 participants each).

HSPP Focus Area	Increasing independence, quality of life, and promoting healthy lifestyles
Project Start & End Date	April 1, 2019 – March 31, 2023
Organization/Agency	Centre for Innovation and Research in Aging (CIRA), York Care Centre, Bruyère Research Institute
Location	Fredericton, Woodstock, Saint John, Stanley, Gagetown
Principal Investigator(s)	Lisa Sheehy and Justine Estey

Indicator	Impact / Outcome / Result	
Falls	Evidence suggests that **community- and facility-based VR is a safe way for seniors who met the study's inclusion criteria to exercise.** • The community-dwelling sample experienced no falls, ER visits, hospitalizations, or long-term care admissions during the project period. • The facility-based sample experienced 4 falls (3 intervention, 1 control), 1 ER visit (control), 2 hospitalizations (control), and 1 death (control). • No falls occurred during VR exercise. • The data compare favourably to the average national senior falls rate (30% annually) and average provincial rate of senior ER visits (6% annually). Due to the small sample size, these findings should be interpreted with caution. These samples may not accurately represent the entire population.	
General Health	Although participants reported in interviews that they **enjoyed the VR** and that **it helped them increase their exercise and mobility**, there were **no statistically significant improvements** in the intervention groups' balance, mobility, gait, or quality of life. • The facility- and community-dwelling intervention groups did an extra 22 or 23 sessions of exercise respectively, averaging 23 or 27 minutes per session over 8 weeks. Most of the participants who were interviewed indicated that they wanted to continue using the VR after the project was completed.	*"It was excellent to stay on track with consistent exercise."*

Methods and Comparison

- The VR program's effectiveness and feasibility was measured using tests of physical function, questionnaires, participant interviews, VR system usage data, and an exercise logbook.
- To explore the program's impact on the healthcare system, the project tracked seniors' ER visits and hospital stays.

Conclusions and Lessons Learned

- VR exercise may be a safe way to increase the uptake of exercise for seniors who can sit or stand for at least 20 minutes, have no health conditions that preclude mild to moderate exercise, and have someone available to supervise their sessions. However, further research is needed to assess the specific impacts of VR exercise on seniors' balance, mobility, gait, and quality of life.
- Technology is often presented as a challenge for seniors to learn to navigate. However, seniors' ability to engage with technology should not be underestimated. Qualitative data indicated that seniors familiarized themselves with and enjoyed using the VR technology during the project.
- Healthcare staff found it challenging to supervise VR exercise in long-term care settings due to high existing workload demands and staff turnover (partly due to the COVID-19 pandemic). Adaptations in the project design (e.g., the addition of a volunteer base to supervise VR exercise sessions) helped address this barrier.
- The effects of the COVID-19 pandemic resulted in low sample sizes. This made it difficult to recruit seniors, conduct the study, and reliably assess project outcomes.

Recommendations

- Market the use of technology to seniors.
- Consider enlisting the help of family members and/or volunteers to supervise exercise interventions.
- Seniors living in their own homes and in long-term care residences should consider VR exercise as a safe way to increase their active minutes.

Next Steps

- Three long-term care facilities have expressed interest in continuing to use VR with their residents, dependent on funding for equipment and licensing.
- VR for Rehabilitation has not yet secured scale-up funding. The project is continuing to explore further funding opportunities.

Disclaimer

The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada.

Financial contribution from

Public Health Agency of Canada | Agence de la santé publique du Canada