An engaging home-based exercise program using iPad technology for preventing falls in older people.

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Exercise to reduce falls

• Exercise interventions are the single most effective strategies to reduce the rate of falls (Gillespie et al., 2012)

• Moderately to highly challenging balance exercises and performed for at least two hours a week over a 6-month period (Sherrington et al., 2008)

• Falls reductions by 42% (Sherrington et al., 2008)
Adherence to exercise interventions

- **Average attrition rate**
  - After 1 year: 52% (range 43-61) (Simek et al., 2012)
  - After 2 years: 65% (Campbell et al., 1999)

- **Why low adherence?** (Yardley et al., 2006)
  - poor exercise enjoyment
  - lack of interest in the program
  - low exercise tolerance
  - low expectation of outcomes
  - fear of falling
  - lack of transport
  - the weather
  - Etc ...
How can we maximising long-term adherence?

• Evidence from surveys and systematic reviews:
  • Older people prefer home-based exercise programs
  • Especially in those older and more socially deprived people who are at the highest risk of falling.
  • Inclusion of balance training is associated with better adherence in home-based exercise programs

• Evidence from health belief model:
  • Education: People who understand that exercising for more than 2 hours per week is an effective strategy to reduce their risk of falls are more likely to adopt these recommendation

Technology can help to deliver this better.
Balance exercises
Standing Tall Features

Convenient

- People can exercise in the comfort of their own home.
- People can choose the time of the day and length of the exercise session that best suits them.
- Accessible to anyone, anywhere, at any time.

Individual

- Individually tailored and progressive:
  - individualizes the balance exercise intensity
  - progresses intensity as participants’ performance improves
  - unlocks different exercises to add variety to the program
  - sends (optional) reminders
Standing Tall Features

Motivating

Engaging

- A progress tracking system graphically displays participants’ performance throughout the trial.
- A scoring system using points gives participants points for each exercise they complete.

Health promotion education program

- additional falls-specific information on known risk factors for falls and prevention strategies
- health-related information relevant to older adults
- Weekly updates
**Standing Tall Features**

**User friendly**

- Designed specially for (and with) older adults.
- Exercise videos (and voice over) give guidance re correct performance and safety of the exercises.
- People can choose how long they want to exercise, and the program select exercises appropriately.
- The app keeps track of how many hours that they have exercised in the past week.
Standing Tall Features

Unique activity planner

Calendar

• Allows you to plan in your exercises
• Option to set alarm to remind you it is time to exercise
• Keeps track of how many minutes of exercises you still need to do

Goal setting

• Short-term goal: How to start new exercise routine?
• Intermediate goal: How to main exercise routine?
• Long-term benefits: Other tasks or activities you want to improve?
Randomized control trial

Primary aim:
1. Can *Standing Tall* **prevent falls** in older people over a 2 year period, when compared to a health promotion education ‘control’ program?

Secondary aims:
1. Will people use the program for 2 years?
2. Will the program have an effect on people’s overall health and fall risk factors? Will people be more active overall?
3. Will our program reduce the costs of falls?
Participants and eligibility criteria

- 70+ years old
- English-speaking
- independent in activities of daily living
- community-dwelling
- able to walk in their home without the use of a walking aid and
- willingness to give informed consent and comply with the study protocol

- ineligible to participate in the trial if they have an unstable or acute medical condition that precludes exercise participation, have a progressive neurological condition (such as Parkinson’s disease, Multiple Sclerosis, Meniere Disease), are cognitively impaired defined as a Pfeiffer Short Portable Mental Status Questionnaire (SPMSQ) score <8, or are currently participating in a fall prevention program
Randomised Control Trial

Recruitment of community-dwelling older adults aged 70 years and older (n=500)

Baseline assessment

Concealed randomization

Exercise intervention group (n=250)
- iPad
- Balance program
- Home visit
- Weekly newsletters
- Report falls

Health promotion education control group (n=250)
- iPad
- NO Standing Tall Balance program
- Weekly newsletters
- Report falls
- Continue usual activities
## Randomised Control Trial

<table>
<thead>
<tr>
<th>Time</th>
<th>Exercise intervention group (n=250)</th>
<th>Health education control group (n=250)</th>
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</thead>
<tbody>
<tr>
<td>1 week</td>
<td>Home visit – installation</td>
<td>📞 Follow-up phone call</td>
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<tr>
<td>1 month</td>
<td>Home visit – follow-up</td>
<td>📞 Follow-up phone call</td>
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<tr>
<td>6 months</td>
<td>Remote reassessment of tablet delivered questionnaires</td>
<td>Remote reassessment of tablet delivered questionnaires</td>
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<td>Home-based balance, gait and mobility reassessment (N=200)</td>
<td>Home-based balance, gait and mobility reassessment (N=200)</td>
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<tr>
<td>12 months</td>
<td>Remote reassessment of tablet delivered questionnaires</td>
<td>Remote reassessment of tablet delivered questionnaires</td>
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<td>Home-based balance, gait and mobility reassessment (N=200)</td>
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<tr>
<td>18 months</td>
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<tr>
<td>24 months</td>
<td>Remote reassessment of tablet delivered questionnaires</td>
<td>Falls follow-up completed</td>
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Recruitment of community-dwelling older adults aged 70 years and older (n=500)

Telephone screening

Baseline assessment

Concealed randomization
Standing Tall team

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