

Additional file 1: VirCube VR Game Training Program (2021 version)

VR Game 1: Jogging exercise

Purpose: Physical balance and safe walking training

Grading: 3 levels (Level 1-by hand trackers; Level 2- by hand trackers & obstacle; Level 3- by hand/foot trackers & obstacles)

Device: 3D stereoscopic eyewear, hand, and foot trackers

VR game- Jogging exercise

Jogging in the park



Sequencing & Grading:

1. Participant uses hand trackers & selects a level of activity
2. Participant runs with arms movement and keeps on a running path (upper limb balance)
3. Participant runs with upper and lower limbs trackers and follows a running path (whole body balance & physical training)
4. Participant runs and avoids hitting any obstacle on a running path (advanced physical balance and coordination skill)
5. Participant runs faster and overcomes more obstacles (physical and



cognitive training)

VR demon (see video clip)



video clip 1.mp4

VR Game 2: Fire Drill

Purpose: Cognitive training - executive function (Problem-solving skill)

Grading: N/A

Device: 3D stereoscopic eyewear, hand controller, hand trackers

VR game – Fire drill

<p>Fire drill exercise</p> 	<p>Sequencing:</p> <ol style="list-style-type: none">1. When fire alarm on, participant moves tracker to point out and touch three important things (key, mobile & wet towel) for evacuation.2. Participant walks to the front door and uses tracker to unlock the door (balance and hand-eye coordination)3. Participant uses tracker to select different escape routes (judgement)4. Participant chooses either route 1 (lift) or route 2 (up/downstairs) to get out of fire scene safely (decision making) 
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VR Game 3: Community Living Skill Practice

Purpose: Cognitive training – executive function (classification & calculation)

Grading: 3 levels (Level 1- free choice; Level 2: shopping items- 2-3; Level 3: shopping items- 3-5)

Device: 3D stereoscopic eyewear, hand controller

VR game- community living skill

<p>Shopping orientation</p> 	<p>Sequencing & Grading:</p> <ol style="list-style-type: none">1. Participant uses hand controller & selects a level of activity2. Participant remembers a shopping list (memory skill)3. Participant goes to the selected shopping regions (making decision)4. Participant chooses and picks up the correct no. of items (classification & counting)5. Participant checks and goes to cashier for payment (calculation)  
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VR Game 4: Balance & sport exercises

Purpose: Cognitive-motor training and advanced balance exercise

Grading: 4 levels:

Level 1- defender (keeping); Level 2-attacker (attacking); Level 3- penalty kick (attacking);

Level 4- penalty kick (goalkeeping)-

Device: 3D stereoscopic eyewear, hand controller, hand, and foot trackers

VR game- balance & sport exercise

Soccer exercise



Sequencing & Grading:

1. Participant uses hand controller & selects a level of activity
2. Participant wears hand and foot trackers, practices passing a soccer to other player (balance & stability)
3. Participant runs and kicks a soccer ball to different position (balancing & weight shifting training)
4. Participant kicks a soccer ball to goalkeeper repeatedly (balancing, stability, weight-shift training to prevent falling)
5. Participant as a goalkeeper uses hand and foot trackers to defend the attacker (advanced limbs balancing and coordination, ball tracking exercise, spatial orientation & higher executive function skill)



VR demon (see video clips)



video clip 2.mp4



video clip 3.mp4