An exergame for unsupervised home-based balance training to improve balance in elderly fallers: a pilot study

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To study the effects of a 6-week unsupervised home-based exergaming training on the balance ability of older adults who have a fall risk or who have fallen without physical consequences.

Ethical review	Approved WMO
Status	Will not start
Health condition type	Other condition
Study type	Observational non invasive

Summary

ID

NL-OMON43060

Source
ToetsingOnline

Brief title
Exergaming to improve balance

Condition

- Other condition

Synonym
balance ability, postural control

Health condition

Houdingscontrole / balans vaardigheden

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Falls, Home training, Prevention, Serious games

Outcome measures

Primary outcome

Balance outcome measures derived from an accelerometer sensor : average sway amplitude, root mean square of the sway, sway frequency, sway area, the regularity and predictability of the sway. In addition three clinical balance measures are used to quantify balance: the NRBT, the FICSIT-4, and the FSST

Secondary outcome

not applicable

Study description

Background summary

Fall injuries are responsible for significant disability, physical dysfunction, and loss of independence among older adults. More than one-third of the elderly falls each year at least once and the resulting medical costs are estimated at M¤670 per year in the Netherlands. Poor postural balance is one of the major risk factors for falling. Within the research center SPRINT of the UMCG a serious game has been developed, exergame (skating game, an exergame (=exercise + game) for unsupervised training of balance of older adults at home. In a first pilot with older adults with no history of falls the feasibility and effect on balance performance was tested. Results showed high adherence to the training, people were motivated, could easy get along with the hardware and software, and over the group balance improved in this healthy group of older adults. In the current study we will replicate this study with a group of older adults who have a high fall risk or a history of falls with no serious physical consequences.

Study objective

To study the effects of a 6-week unsupervised home-based exergaming training on the balance ability of older adults who have a fall risk or who have fallen without physical consequences.

Study design

Ten older adults independently living fallers play the skating exergame for six weeks (at least three times per week 30 minutes) in their home environment. During gameplay whole body movement data is collected using Kinect.
At the first and last day of the 6-weeks exergame period, as well as on day 15 and 29 a series of balance measurements is performed in the home environment. These measurements include three existing validated static and dynamic balance tests: the Narrow Ridge Balance Test (NRBT), a balance scale including tandem stance (FICSIT-4), and the Four Step Square Test (FSST). During these test participants will wear a small device with accelerometers. Additionally 5 one-minute exergame trials are conducted during from which the balance will be quantified using previous defined parameters. Furthermore, on the first and last day of the six week intervention period the Falls Efficacy Scale (FES) the Impact on Participation and Autonomy (IPA), questionnaire will be administered. On the last day a short evaluation questionnaire about the experiences with the skating game is filled in.

Study burden and risks

No risks other than during normal daily activities are present during gameplay and no discomfort is experienced. The game can be played in different difficulty settings and a student is present during gameplay the first three times unless a participant indicates that they feel comfortable playing the game without their attendance. The exercise game itself is not intense and participants are not challenged to make sway movements that are out of their comfort zone.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Older adults 65 year or older
Older adults who are referred to the fall clinic according to the directions for fall preventions in the *1e en 2e lijn zorg* because 1) they fell in the previous year without medical consequences and without medical explanation 2) they have an instable gait and problems with balance.
Able to stand without walking aid for 3-5 minutes.

Exclusion criteria

Neuromuscular or orthopaedic impairments that might affect balance ability.
History of fall(s), which caused trauma or with medical explanation (e.g. neurological or orthopedic disorder) for fall
Impaired cognitive function (MMSE < 24)
Knee or hip prosthesis implanted less than one year ago.
BMI of 30+
Self-reported orthostatic complaints or the use of medication that can cause orthostatic hypotension
Eye- or hearing impairments that might affect balance ability or gaming experience.
No understanding of the Dutch language

Study design

Design

Study type: Observational non invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Prevention

Recruitment

NL

Recruitment status:	Will not start
Enrollment:	10
Type:	Actual

Ethics review

Approved WMO

Date:	13-01-2017
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL59514.042.16