Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Comparison of virtual reality based training and motor-cognitive dual task training effects on the linear and nonlinear features of center of pressure in older adults

Protocol summary

Summary

The main purpose of this study is to find which type of treatment (cognitive-motor intervention or virtual reality method) is more effective to improve the postural control of older adults. It is estimated 27 healthy older adults are sufficient for this study. The inclusion criteria for healthy older adults are the following: Age ≥ 65 years old, be free from any severe cardiopulmonary disease, neurological disorder, musculoskeletal impairment or any history of falls in the prior 6 months. Subjects are excluded from either group if had any dizziness, fatigue, vigorous physical activity or stress before testing. After baseline evaluation, subjects are randomly allocated to one of the two groups: (1) cognitive-motor dual-task training, (2) virtual reality based training. Cognitive-motor dual-task training is balance training while simultaneously engaging in a secondary cognitive task. Virtual reality based training is balance training in a virtual environment using programs of Wii fit. Participants in these groups are attended 12-16 sessions, 3 sessions per week, and 60 minutes per session. The outcome measurements take place at 3 time points: (1) before initiation of intervention (baseline), (2) after completion of training, (3) 8 weeks after completion of training. The outcome measurements are linear and nonlinear parameters of center of pressure under different dual task conditions and parameters related to clinical and neurocognitive tests.

General information

Acronym

IRCT registration information

IRCT registration number: **IRCT2016122626779N2**
Registration date: **2016-12-30, 1395/10/10**
Registration timing: **prospective**
Last update:
Update count: **0**

Registration date

2016-12-30, 1395/10/10

Registrant information

Name

Hossein Bagheri

Name of organization / entity

Tehran Universaity of Medical Sciences, Faculty of Rehabilitation

Country

Iran (Islamic Republic of)

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+98 21 7753 3939

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Recruitment status

Recruitment complete

Funding source

Tehran University of Medical Sciences

Expected recruitment start date

2017-01-20, 1395/11/01

Expected recruitment end date

2018-01-21, 1396/11/01

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison of virtual reality based training and motor-cognitive dual task training effects on the linear and nonlinear features of center of pressure in older adults

Public title

Comparison of virtual reality based training and motor-cognitive dual task training effects on the linear and nonlinear features of center of pressure in older adults

Purpose
Treatment

Inclusion/Exclusion criteria
Inclusion criteria: Age ≥ 65 years old; BBS score >40; TUG score ≤20; ABC score ≥50%; MMSE score ≥24; HADS- depress subscale score ≤7; Have no severe cardiopulmonary disease, neurological disorder and musculoskeletal impairment; Have no history of falls in the prior 6 months. Exclusion criteria: had vigorous physical activity before testing; had dizziness, fatigue, and stress during testing

Age
From **65 years** old

Gender
Both

Phase
N/A

Groups that have been masked
No information

Sample size
Target sample size: **27**

Randomization (investigator's opinion)
Randomized

Randomization description

Blinding (investigator's opinion)
Single blinded

Blinding description

Placebo
Not used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Research Ethics Committee of Tehran University of Medical Sciences

Street address
Central Organization of Tehran University of Medical Sciences, Qods St., Keshavarz Blvd.

City
Tehran

Postal code

Approval date
2016-12-24, 1395/10/04

Ethics committee reference number
REC-1395-1294

Health conditions studied

1

Description of health condition studied
elderly

ICD-10 code
G31.1

ICD-10 code description
Senile degeneration of brain, not elsewhere classified

Primary outcomes

1

Description
Verbal reaction accuracy

Timepoint
before training, after completion of training, 8 weeks after completion of training

Method of measurement
Recorder - Sound Forge Pro

2

Description
Correlation dimension

Timepoint
before training, after completion of training, 8 weeks after completion of training

Method of measurement
force plate

3

Description
Verbal reaction time

Timepoint
before training, after completion of training, 8 weeks after completion of training

Method of measurement
Recorder - Sound Forge Pro

4

Description
Lyapunov exponent

Timepoint
before training, after completion of training, 8 weeks after completion of training

Method of measurement
force plate

5

Description
approximate entropy

Timepoint
before training, after completion of training, 8 weeks after completion of training

Method of measurement
force plate

6

Description
Postural sway area
Timepoint
before training, after completion of training, 8 weeks after completion of training
Method of measurement
force plate

7

Description
Phase plane
Timepoint
before training, after completion of training, 8 weeks after completion of training
Method of measurement
force plate

8

Description
Velocity of center of pressure displacement
Timepoint
before training, after completion of training, 8 weeks after completion of training
Method of measurement
force plate

9

Description
Standard deviation of center of pressure displacement
Timepoint
before training, after completion of training, 8 weeks after completion of training
Method of measurement
force plate

Secondary outcomes

1

Description
BBC score
Timepoint
before training, after completion of training, 8 weeks after completion of training
Method of measurement
Questionnaire

2

Description
TUG time
Timepoint
before training, after completion of training, 8 weeks after completion of training
Method of measurement
Timmer

3

Description
ABC score
Timepoint
before training, after completion of training, 8 weeks after completion of training
Method of measurement
Questionnaire

4

Description
TMT (A,B) score
Timepoint
before training, after completion of training, 8 weeks after completion of training
Method of measurement
Questionnaire and timmer

Intervention groups

1

Description
Balance training in a virtual environment using programs of Wii fit. Participants in this group are attended 12-16 sessions, 3 sessions per week, and 60 minutes per session.
Category
Behavior

2

Description
Balance training while simultaneously engaging in a secondary cognitive task. Participants in this group are attended 12-16 sessions, 3 sessions per week, and 60 minutes per session.
Category
Behavior

Recruitment centers

1

Recruitment center
Name of recruitment center
Rehabilitation Faculty
Full name of responsible person
Dr. Roya Khanmohammadi
Street address
Tehran-enghelab street- piche shemiran- Physical Therapy Department
City
Tehran

Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Tehran University of Medical Sciences Vice chancellor for research
Full name of responsible person
Dr. Masud Yunesian (Research Deputy of Tehran University of Medical Sciences)
Street address
Central Organization of Tehran University of Medical Sciences, Qods St., Keshavarz Blvd.
City
Tehran

Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?
Yes

Title of funding source
Tehran University of Medical Sciences Vice chancellor for research

Proportion provided by this source
100

Public or private sector
empty

Domestic or foreign origin
empty

Category of foreign source of funding
empty

Country of origin

Type of organization providing the funding
empty

Person responsible for general inquiries

Contact

Name of organization / entity
Rehabilitation Faculty- Tehran University of Medical Sciences
Full name of responsible person
Dr. Roya Khanmohammadi
Position
PhD of physiotherapy
Other areas of specialty/work
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Person responsible for scientific inquiries

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Person responsible for updating data

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Sharing plan

Deidentified Individual Participant Data Set (IPD)
empty

Study Protocol
empty

Statistical Analysis Plan
empty

Informed Consent Form
empty

Clinical Study Report
empty

Analytic Code
empty

Data Dictionary
empty