



The effectiveness of a video-supported group-based Otago exercise programme on physical performance in community-dwelling older adults: a preliminary study

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Abstract

Objectives To evaluate the short-term effects of a video-supported group-based Otago exercise programme (OEP) on physical performance variables in independent community-dwelling older adults.

Design Preliminary randomized controlled trial.

Setting Local senior centre.

Participants Fifty-one adults aged 65 and older with no cognitive impairment.

Intervention Participants were randomly allocated to the intervention group (IG) or to the control group (CG). During 4 months, IG participants performed the exercise routine.

Measurements The primary outcome measure was the Timed ‘Up-and-Go’ test (TUG). Secondary outcome measurements included functional balance, one-leg balance, lower-limb function and aerobic endurance. All data were collected before and after intervention.

Results TUG scores showed a significant reduction in the performance time in the IG compared to CG after intervention [IG 7.5 (2.0) vs CG 8.8 (1.9), mean difference -1.3 seconds, 95% confidence interval (CI) of the difference -2.3 to -0.1 ; $P=0.03$]. Secondary outcomes also showed a significant improvement in the performance of the functional balance [IG 54.9 (2.5) vs CG 51.4 (5.3), mean difference 3.5 points, 95% CI 1.2 to 5.8; $P=0.003$], one-leg balance [IG 39.1 (21.6) vs CG 15.6 (12.1), mean difference 23.5 seconds, 95% CI 13.3 to 33.7; $P<0.001$] and lower extremity strength [IG 8.7 (3.8) vs CG 10.9 (3.3), mean difference -2.2 seconds, 95% CI -4.2 to -0.1 ; $P=0.035$] in the IG compared to CG.

Conclusion This study shows that, from a short-term perspective, a video-supported group-based OEP programme can significantly improve the levels of mobility, functional balance, one-leg balance and lower extremity strength in community-dwelling older adults.

Trial registration ClinicalTrials.gov ID: NCT02218411.

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Keywords: Otago exercise programme; Physical performance; Older adult; Community dwelling; Randomized controlled trial

Introduction

The ageing process is characterized by a progressive decrease in muscle mass and strength that especially accelerates after the sixth decade of life [1,2]. Strength loss may reach up to 1 to 3% per year, showing higher rates in the lower extremities [3,4] even in healthy older adults. These losses, combined with the reduction of physical activity [5], have been associated with a functional decline [6], an increase

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in fall risk [7], the loss of independence [8], institutionalization [9] and, finally, an increase in mortality risk [10]. Therefore, treating or reversing these disabling age-related consequences is of vital importance in the maintenance of health and life expectancy, and an essential public health goal for the 21st century [11].

Different types of exercise programmes have been conducted during the past few decades, focusing on the maintenance and improvement of the functional performance and health-related quality of life in older adults [12–14]. Consequently, it has been widely demonstrated that regular exercise and physical activity provide substantial health benefits and attenuate the ageing phenomenon [15,16]. Furthermore, recent exercise and physical activity guidelines for older adults stress the importance of using multi-modal exercise programmes, which should include strengthening, balance, and cardiovascular exercises [17,18]. The Otago exercise programme (OEP) incorporates all these suggested aspects.

The OEP consists of progressive-resistance strength exercises, balance exercises related to everyday activities, and aerobic exercises supplemented with walking periods [19]. Commonly, it has been conducted at the patients' homes following a written booklet [20–23]. Its effectiveness has been demonstrated by improved muscle strength, functional balance and physical performance in older adults [24–26]. Recently, the group-based modality has been proved to be as effective as the home-based one [27], and it has been recommended for use in conjunction with other group activities [19]. Additionally, engaging a group-based exercise programme provides the opportunity for social interaction during the training sessions of the programme [18], and therefore supports the promotion of physical activity in community-dwelling older adults.

On the other hand, the use of video materials in exercise programmes has reported significant improvements on physical performance [28,29] and physical activity levels [30] in community-dwelling older adults. The use of video can provide accurate visual guidance on how to perform the exercises, in addition to verbal instructions and background music that could be motivational for the participants [28].

To the best of our knowledge, the combination of video-support with a group-based modality has not yet been explored in the OEP. Therefore, the purpose of this study was to evaluate the effects of a video-supported group-based OEP intervention on the mobility and other physical performance variables in community-dwelling adults aged 65 or older.

Methods

Study design

This preliminary randomized controlled study (ClinicalTrials.gov ID: NCT02218411) follows the recommendations of the Consolidated Standards of Reporting Trials [31].

The design, protocols and informed consent procedure of the study were approved by the Bioethics and Clinical Research Committee of UCH-CEU University. All participants included in this study provided written informed consent and were randomly assigned to the intervention group (IG) or to the control group (CG) after baseline assessment. Participants were assessed at baseline and at the end of a 4-month intervention by the same independent assessors. The study was carried out in full compliance with the ethical guidelines of the Declaration of Helsinki.

Study participants and selection criteria

The sample consisted of community-dwelling people, aged 65 years or older, from Valencia, Spain. Fifty-five potential participants were voluntarily recruited through advertisements in the bulletin board of a local community centre as well as through presentation by researchers to community groups. Recruitment started in September 2012 and was completed in January 2013. Fig. S1 shows the participants flowchart through the trial. After an individual interview conducted by a physical therapist (PT) with 25 years of clinical experience in older adults, eligible participants were screened for inclusion. During the interview, all participants received fully explained and comprehensive information of the proposed study, its duration, objectives, benefits, and risks. The inclusion criteria were that the participants should be 65 years of age or older, live in the community, be able to ambulate independently without a walking aid, have no severe medical contraindication for physical activity, be able to communicate, have self-reported visual and auditory capacities to follow the exercises, and would provide a signed informed-consent statement. Those who were unable to ambulate independently or had a Mini-mental state examination score of less than 24 [32], a Barthel Index (BI) score of less than 80 [33], severe visual and auditory disabilities, an unstable cardiovascular disease, a neurological disorder that could compromise them from exercising, or an upper- or lower-extremity fracture in the past year, were excluded. Fifty-one of the 55 eligible participants met the inclusion criteria and completed the baseline assessment.

Supplementary Fig. S1 related to this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.physio.2015.08.002>.

Randomization and blinding

After the baseline assessments, participants were randomly allocated to the IG or to the CG using computer-generated random numbers. The group allocation was concealed to the researchers. The assessors who collected the data were blinded to the group allocation; however, it was not possible to conceal the group assignment from the co-investigators involved in the training procedures.

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