Effects of Balance Training on Balance Performance in Healthy Older Adults: A Systematic Review and Meta-analysis

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Abstract
Background The effects of balance training (BT) in older adults on proxies of postural control and mobility are well documented in the literature. However, evidence-based dose–response relationships in BT modalities (i.e., training period, training frequency, training volume) have not yet been established in healthy older adults.

Objectives The objectives of this systematic literature review and meta-analysis are to quantify BT intervention effects and to additionally characterize dose–response relationships of BT modalities (e.g., training period, training frequency) through the analysis of randomized controlled trials (RCTs) that could maximize improvements in balance performance in healthy community-dwelling older adults.

Data Sources A computerized systematic literature search was performed in the electronic databases PubMed and Web of Science from January 1985 up to January 2015 to capture all articles related to BT in healthy old community-dwelling adults.

Study Eligibility Criteria A systematic approach was used to evaluate the 345 articles identified for initial review. Only RCTs were included if they investigated BT in healthy community-dwelling adults aged ≥65 years and tested at least one behavioral balance performance outcome (e.g., center of pressure displacements during single-leg stance). In total, 23 studies met the inclusionary criteria for review.

Study Appraisal and Synthesis Methods Weighted mean standardized mean differences between subjects (SMDsub) of the intervention-induced adaptations in balance performance were calculated using a random-effects model and tested for an overall intervention effect relative to passive controls. The included studies were coded for the following criteria: training modalities (i.e., training period, training frequency, training volume) and balance outcomes [static/dynamic steady-state (i.e., maintaining a steady position during standing and walking), proactive balance (i.e., compensation of an unpredicted perturbation) as well as balance test batteries (i.e., combined testing of different balance components as for example the Berg Balance Scale)]. Heterogeneity between studies was assessed using I² and Chi²-statistics. The methodological quality of each study was tested by means of the Physiotherapy Evidence Database (PEDro) Scale.

Results Weighted mean SMDsub showed that BT is an effective means to improve static steady-state (mean SMDsub = 0.51), dynamic steady-state (mean SMDsub = 0.44), proactive (mean SMDsub = 1.73), and...
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I, John Smith, acknowledge that I have read this professional resource in its entirety for educational purposes in order to develop my knowledge on Risk Management in the Fitness Industry on July 1st, 2018.

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