

## Publication

### Agility Training to Integratively Promote Neuromuscular, Cognitive, Cardiovascular and Psychosocial Function in Healthy Older Adults: A Study Protocol of a One-Year Randomized-Controlled Trial

#### **JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**

**ID** 4605850

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**Year** 2020

**Title** Agility Training to Integratively Promote Neuromuscular, Cognitive, Cardiovascular and Psychosocial Function in Healthy Older Adults: A Study Protocol of a One-Year Randomized-Controlled Trial

**Journal** International journal of environmental research and public health

**Volume** 17

**Number** 6

**Pages / Article-Number** 1853

**Keywords** agility; cardiovascular; cognitive; community dwelling; health-related physical activity; healthy aging; multimodal exercise training; neuromuscular; prevention; psychosocial

**Mesh terms** Accidental Falls, prevention & control; Aged; Cardiovascular Diseases, prevention & control; Cognition; Exercise; Exercise Therapy; Humans; Neuromuscular Diseases, prevention & control; Postural Balance; Psychology; Walking Speed

Exercise training effectively mitigates aging-induced health and fitness impairments. Traditional training recommendations for the elderly focus separately on relevant physiological fitness domains, such as balance, flexibility, strength and endurance. Thus, a more holistic and functional training framework is needed. The proposed agility training concept integratively tackles spatial orientation, stop and go, balance and strength. The presented protocol aims at introducing a two-armed, one-year randomized controlled trial, evaluating the effects of this concept on neuromuscular, cardiovascular, cognitive and psychosocial health outcomes in healthy older adults. Eighty-five participants were enrolled in this ongoing trial. Seventy-nine participants completed baseline testing and were block-randomized to the agility training group or the inactive control group. All participants undergo pre- and post-testing with interim assessment after six months. The intervention group currently receives supervised, group-based agility training twice a week over one year, with progressively demanding perceptual, cognitive and physical exercises. Knee extension strength, reactive balance, dual task gait speed and the Agility Challenge for the Elderly (ACE) serve as primary endpoints and neuromuscular, cognitive, cardiovascular, and psychosocial measures serve as surrogate secondary outcomes. Our protocol promotes a comprehensive exercise training concept for older adults, that might facilitate stakeholders in health and exercise to stimulate relevant health outcomes without relying on excessively time-consuming physical activity recommendations.

**Publisher** Multidisciplinary Digital Publishing Institute

**ISSN/ISBN** 1661-7827 ; 1660-4601

**URL** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7143005/>

**edoc-URL** <https://edoc.unibas.ch/79103/>

**Full Text on edoc** No;

**Digital Object Identifier DOI** 10.3390/ijerph17061853

**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/32178430>

**ISI-Number** WOS:000529342300043

**Document type (ISI)** Journal Article, Randomized Controlled Trial