

A combined intervention on psychological and physical capacities of frail older adults: Randomized Controlled Trial

Filipa Couto¹, Maria dos Anjos Dixe², Timóteo Camacho³, Elzbieta Bobrowicz-Campos⁴, Rita Santos-Rocha⁵, Mónica Braúna⁶, Jaime Ribeiro⁷, João Apóstolo⁸

¹The Health Sciences Research Unit: Nursing, Nursing School of Coimbra, Portugal, filipadccouto@esenfc.pt

²Center for Innovative Care and Health Technology (ciTechCare), Polytechnic Institute of Leiria, Leiria, manjos.dixe@gmail.com

³Center for Innovative Care and Health Technology (ciTechCare), Polytechnic Institute of Leiria, Leiria, timoteojcamacho@gmail.com

⁴The Health Sciences Research Unit: Nursing, Nursing School of Coimbra, Portugal, elzbieta.campos@gmail.com

⁵ Sport Sciences School of Rio Maior (ESDRM), Polytechnic Institute of Santarém, Santarém, ritasantosrocha@esdrm.ipsantarem.pt

⁶Center for Innovative Care and Health Technology (ciTechCare), Polytechnic Institute of Leiria, Leiria monicabraunacosta@gmail.com

⁷Center for Innovative Care and Health Technology (ciTechCare), Polytechnic Institute of Leiria, Leiria jaimе.ribeiro@ipleiria.pt

⁸The Health Sciences Research Unit: Nursing, Nursing School of Coimbra, Portugal, apostolo@esenfc.pt

ABSTRACT

BACKGROUND: Frail older adults experience physical and psychological decline^[1,2] that lead to a decrease in self-care and independence. Adapted and structured combined interventions including multiple components are associated to delay of frailty progression^[3,4,5]. **OBJECTIVE:** To assess the effectiveness of a Combined Intervention (CI) composed of a Cognitive Stimulation Program (CSP) and a Physical Exercise Program (PEP) on cognitive and physical capacities, humor and activities of daily living of frail older adults **Design:** A single-blinded two-arm randomized controlled trial with multicenter approach was conducted among frail older adults from day-centers and nursing homes. **METHODS:** Fifty clinically stable subjects, with capacity to actively participate in CI, without severe cognitive decline and severe depressive symptomatology, were recruited. Forty-four older adults (65.9% female), mean age of 80.55 ± 8.47 years were considered eligible to participate in the study. Participants were randomly allocated in intervention group (IG) to receive CI or in control group (CG) to receive standard care. Data was collected at baseline and post-intervention. Primary outcomes were cognitive performance, depressive symptomatology, gait speed, biomechanical parameters of gait, risk of fall based on gait and balance and anthropometric data. Activities of daily living were a secondary outcome. The IG received CI three times a week (two sessions of PEP and one session of CSP), during 12 weeks. Data were analyzed considering non-parametric within-group (*Wilcoxon test*) and between-

group (*Mann Whitney test*) tests. **RESULTS:** Within-group analysis revealed that IG significantly reduced depressive symptomatology ($p= 0.023$) and risk of fall based on gait and balance ($p= 0.009$), and improved static balance ($p= 0.002$), gait speed ($p= 0.037$), and weight ($p= 0.040$). For CG, within-group analysis revealed significant decrease in terms of orientation ($p = 0.014$) and activities of daily living ($p= 0.021$); CG showed a decrease in body mass index ($p= 0.031$) and a marginal improvement on delayed verbal recall ($p= 0.053$). Between-group analysis revealed the best results on the IG where statistically significant post-intervention differences were found in depressive symptomatology ($p = 0.024$) and in the orientation' subdomain ($p= 0.025$). **CONCLUSION:** CI composed of cognitive stimulation and physical exercise improved cognitive and physical capacities of frail older adults. CI also showed to have potential impact on postponing decline in ADL. Based on these study results, it can be concluded that CI is a structured, adapted, sustainable, non-pharmacological and effective approach with high possibility of replication.

Keywords: *frail elderly; exercise; cognitive stimulation; combined intervention; nursing*

References:

- [1] Gobbens RJ, Van Assen MA, Luijkx KG, Schols JM. Testing an integral conceptual model of frailty. *J Adv Nurs*. 2012; 68(9): 2047–60.
- [2] Kelaiditi E, Cesari M, Canevelli M, van Kan GA, Ousset PJ, Gillette-Guyonnet, et al..Cognitive frailty: rational and definition from an (I.A.N.A./I.A.G.G.) international consensus group. *J Nutr Health Aging*. 2013; 17(9): 726-34.
- [3] Apóstolo J, Cooke R, Bobrowicz-Campos E, Santana S, Marcucci M, Cano A, et al.. Predicting risk and outcomes for frail older adults: an umbrella review of frailty screening tools. *JB Database System Rev Implement Rep*. 2017; 15(4): 1154-208.
- [4] Apóstolo J, Cooke R, Bobrowicz-Campos E, Santana S, Marcucci M, Cano A, et al.. Effectiveness of interventions to prevent pre-frailty and frailty progression in older adults: a systematic review. *JB Database System Rev Implement Rep*. 2018; 16(1): 140–232.
- [5] de Labra C, Guimaraes-Pinheiro C, Maseda A, Lorenzo T, Millán-Calenti JC. Effects of physical exercise interventions in frail older adults: a systematic review of randomized controlled trials. *BMC Geriatr*. 2015; 15(154).

Trial registration—registry

ClinicalTrials.gov: NCT03390478

Funding: The current abstract is presented on behalf of a research group. It is part of the MIND&GAIT project (POCI-01-0145-FEDER-023822) funded by the program COMPETE 2020 under the Scientific and Technological Research Support System, with an incentive of European Regional Development Fund (ERDF).