

PROHEALTH

A novel technology-based care concept for an accessible and personalized cognitive-motor therapy to counteract frailty and promote health

KEYWORDS

cognitive-motor training, exergaming, home-based training, frailty, fall prevention, pragmatic randomized controlled trial, cost-efficiency

DURATION

36 months

ABSTRACT

The health and care systems of Europe need to transform to be able to respond to the increasing number of frail people due to diseases and age-related declines. Considering the increasing prevalence of frailty worldwide combined with the current workforce shortages, new solutions are urgently needed. The health and care system of the future needs to offer accessible and effective interventions which are cost-efficient and engaging. A new ICT-based care concept that focusses on continuity of care and personalized treatment was developed over the last years (within the scope of a former AAL project COCARE). This concept utilizes easy-to-use technology (pressure-sensitive mat equipped with sensors connected to a screen) for home-based motor-cognitive therapy. Motor-cognitive training is well known to counteract frailty by improving physical and cognitive functions. An excellent tool to provide motor-cognitive training is exergaming. Exergames combine physical activity with cognitive challenges and have been shown to lead to an engaging training experience. The software of the proposed concept enables personalized training (through an assessment system and in-game progression algorithms) and remote monitoring by a therapist. First feasibility studies have shown promising results in terms of usability, enjoyment, compliance and effectiveness. The newly developed care concept is now ready for large scale implementation to establish not only its effectiveness but also its cost-efficiency, which will facilitate its adoption by the local service providers and healthcare systems. The proposed project will include a pragmatic randomized controlled trial with a targeted sample size of about 300 frail patients over all study sites of the involved project partners in three countries. Aim of the RCT will be to reduce physical and cognitive frailty and to improve fall-risk factors in frail adults with multiple comorbidities. Personalized and progressive exergame-based cognitive-motor therapy conducted with a certified medical product (Dividat SensoFlex) at patients homes will be compared to usual care (at least 12 weeks intervention period with another 12 weeks follow-up). Primary outcome of this study will be cognitive-motor performance. Secondary outcomes will be number of falls, cost-benefit, additional physical and cognitive performance parameters as well as psychosocial measures. As the proposed care concept is applicable with different pathologies, any frail person that can benefit from cognitive-motor training can be included in the trial (exclusion would be severe acute conditions that would compromise safety during home-based training). The expected impact of the PROHEALTH project is manifold. Cognitive-motor training is already proven to benefit several physical and cognitive functions and thus counteract frailty. Exergaming has the potential to increase enjoyment due to its motivational character and thus to enhance engagement and long-term compliance which in turn will maximize the effects.

Moreover, the effects will be maximized due to the personalization of therapy which ensures optimal support of individual needs. Furthermore, as an ICT-based tool with remote monitoring, accessibility to treatment will increase and at the same time staff resources will decrease, which will help to relieve pressure on the health and care facilities and in the long term has the potential to transform the healthcare system. Finally, traditional studies do not adequately inform clinical practice because they are optimized to determine efficacy under idealized circumstances with inflexible protocols and highly selected participants, leading to potential overestimation of benefits and underestimation of harms. The proposed project will generate evidence about the effectiveness of ICT-based, remote therapy under the conditions in which therapy is actually applied which will inform not only the scientific community but also the healthcare sector.

PARTNERS

PI	Organisation	Country
Adcock	Dividat AG	Switzerland
Ferrarin	Fondazione Don Carlo Gnocchi Onlus	Italy
Giannouli	Swiss Federal Institute of Technology in Zurich (Eidgenössische Technische Hochschule Zürich)	Switzerland
Marusic	Alma Mater Europaea - Evropski center, Maribor	Slovenia