

DanceMove: ideation, development, and assessment of a step-based digital solution for promoting physical and cognitive activity

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FIGURE 1
DanceMove user interface.

In the past years, the number of people aged 65 and over has increased drastically and is expected to double to 1.5 billion by the year 2050 (1). With the increase in the number of older adults and the average life expectancy, it is essential to find ways to preserve and improve the functional capacities of those reaching advanced age (2). Among the interventions aiming to promote active and healthy aging, cognitive training and physical activity are widely recommended (3). Step-based digital solutions enable the simultaneous combination of physical and cognitive activities. This study describes the process of i) designing and developing and ii) testing the usability and effectiveness of a step-based digital solution aiming to promote physical and cognitive training (DanceMove) by community-dwelling older adults in a multiple-step mixed methods study design. The development process was subdivided into four phases: i) concept and ideation, ii) design and development of the prototype, iii) testing of the functional mock-ups, and iv) testing of the prototype in the laboratory and the real context of use involving an interdisciplinary team of researchers (n=8), health professionals (n=5) and older adults (n=14). After the four steps of development were finished a fully functional solution was available. The effectiveness of this version of the solution was assessed in a mixed methods randomized and controlled trial involving 70 older adults. Access to the DanceMove and to a dancing mat was given to each participant to use at home for 8 weeks without any direct supervision, but weekly telephone contact with the researchers. Results suggest that DanceMove was an enjoyable means of promoting physical and cognitive activity that can be used at home without direct supervision and no reported adverse events. This work was developed was supported by the SHAPES (Smart and Health Ageing through People Engaging in Supportive Systems) project funded by the Horizon 2020 Framework Program of the European Union

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References

- United Nations. World Population Ageing 2019: Highlights. <https://www.un.org/en/development/desa/population/publications/pdf/ageing/WorldPopulationAgeing2019-Highlights.pdf> (2019).
- Active and Healthy Ageing (AHA) – European Centre for Social Welfare Policy and Research. <https://www.euro.centre.org/domains/active-and-healthy-ageing>.
- Gavelin, H. M. et al. Combined physical and cognitive training for older adults with and without cognitive impairment: A systematic review and network meta-analysis of randomized controlled trials. *Ageing Res Rev* 66, 101232 (2021).

