

# IoT-based home system for integrated care services: a qualitative investigation involving older adults with multiple chronic health conditions

Evert-Jan Hoogerwerf, Lisa Cesario, Valentina Fiordelmondo, Arianna Gherardini, Massimiliano Malavasi, Carlo Montanari, Lorenzo Desideri (*WeCareMore Centre for Research and Innovation of AIAS Bologna onlus*)

**Background and objectives:** Many countries in the world are experiencing growth in the number and proportion of older persons in their population [1]. While population aging can be seen as one of the biggest achievements of modern medicine and public health measures, an aging society also poses important challenges for the sustainability of healthcare systems. Multimorbidity, defined as the coexistence of two or more chronic conditions, is certainly one of the main challenges related to increased longevity [2].

Evidence suggests that digital health solutions have the potential to improve care provision for older people with multiple chronic conditions [3]. Successful implementation of digital health solutions within ecosystems of health care requires an understanding of users' needs and clear assessment of the factors that may facilitate the adoption and sustained use of a solution as part of an effective model of coordinated care [4] [5].

In this contribution we present the results from a qualitative investigation aimed at testing the transferability of an ICT-based solution for integrated care and the self-management of chronic conditions, optimized for older people with multimorbidity.

**Method:** The study (H2020, GA 689996) was conducted in Bologna, in Italy. In total, 15 participants (older adults >65 years of age) grouped into three different use-case scenarios were given the possibility to use the ICT solution in their living environments (i.e. private homes, sheltered apartments) for one month. Follow-up focus groups were conducted to assess the participants' experience with the system. Thematic analysis of the focus group transcripts was conducted to identify factors influencing the usability, acceptability and perceived affordability (accessibility) of the ICT solution in different use contexts.

**Results:** From this analysis, four main factors related to context, user, intervention and technology were identified as potentially influencing adoption and use of the ICT solution on a daily basis. In addition, 12 sub-themes were identified as providing a comprehensive overview of the users' views on the tested system. Overall, the results from this qualitative investigation point to the need to consider technical as well as psychological factors to ensure that digital health-based solutions are accepted by their end users and are perceived as useful.

**Conclusions:** The results from the qualitative investigation allowed the design of a randomized controlled trial that will be conducted to further validate the usability of the ICT solution (study protocol n. ID 4995. H2020, GA 945449).

## References

[1] United Nations, Department of Economic and Social Affairs. World Population Ageing 2015.

[2] Barnett K, et al. Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. LANCET 2012; 380: 37-43.

[3] Topol E. Digital medicine: empowering both patients and clinicians. LANCET 2016; 388: 740-741.

[4] Cresswell KM, Bates DW, Sheikh A. Ten key considerations for the successful implementation and adoption of large-scale health information technology. J AM MED INFORM ASSN 2013; 20(e1): e9-e13.

[5] Murphy E, Doyle J, Hannigan C, Hoogerwerf E-J. et al. Perceptions and Use of Technology to Support Older Adults with Multimorbidity. Stud Health Technol Inform. 2017; 242:160-167.