Features for Effectiveness of Telecare to increase Well-being

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Abstract

"Today, approximately 10% of the world's population is over the age of 60; by 2050 this proportion will have more than doubled"[1]. The growing population of people aged 65+ in the Netherlands, as in most western-world countries, is leading to social and economic burden. To reduce this pressure, aging adults could stay in their homes for a longer period of time if supported by smart home and telecare technology. Technology that supports older adults can have a positive effect on their psychological and physical well-being in a way that they may live independently for longer periods of time. This relationship between smart home and telecare technology, well-being and independent living, although assumed in many papers, has not yet been tested empirically in a systematic way. Previous studies on smart home technology have identified various difficulties in the implementation process, ranging from a mismatch between personal needs and technical functionalities, technical and usability problems, to organizational problems concerning user-support and care-giving. We believe that these problems will negatively influence the perceived benefits and use of smart home and telecare technology. This study is conducted to identify relevant factors that influence the use of smart home and telecare technologies in order to develop a measurement tool for telecare acceptance.

Problems with smart home and telecare technology use can partially be ascribed to differences in perception of the many sequential and parallel stakeholders involved – e.g. caregivers, care receivers, and designers – due to their various backgrounds and experiences. To decrease the perceptual differences between stakeholders, an analysis tool was proposed for the expected and experienced effects (E-E analysis)[2] of smart home and telecare technology in home care situations. However, the technology can only become effective if it is actually accepted and used by the end-users. According to the technology acceptance model (TAM) people intend to use technology on the basis of its perceived usefulness and its perceived ease of use[3]. In this study we revise the original TAM to explain the use of smart home and telecare technology by older adults. In the revised model we make the variable 'usefulness' more specific, by describing the benefits of the technology that are expected to positively affect technology usage. Additionally, we state that several moderator variables – that are expected to influence this effect – should be added to the model in order to explain why people eventually do (not) use smart home technology, despite the benefits and the intention to use. We categorize these variables, that represent the problems found in previous studies, in 'accessibility', 'facilitating conditions' and 'personal variables'.

The model will be tested in the field by researching the use of telecare technology (with multiple functionalities, such as personal alarms, screen-to-screen communication, and teleservices) by approx. 100 Dutch households. The determinants of *benefits*, related to personal needs, are increased sense of safety, increased autonomy and independence, increased well-being, and unburden of (informal) care and are measured before and after the introduction of telecare technology. *Accessibility* determinants, involving design elements and system characteristics (e.g. memorability) but also investments, are obtained by observation of usage and questionnaires. The *facilitating conditions* involve training, documentation, and user support, while *personal variables* involve self-efficacy, gender, and computer experience. The frequency of use is subjectively and objectively measured.

The research will provide guidelines for design, implementation and functionality of smart home and telecare technology for older adults. It will provide insight into what features contribute to effective use of technology for older adults who live at home independently.

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