A New System to Assist Elders’ Self-Care and Their Informal Caregivers

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ABSTRACT

The ageing of a population increases the number of elders dependent in self-care. Thus, being dependent in a home context is a fact that deserves attention from social support entities integrated into the community, such as nursing homes, which play a central role in supporting the families involved. In this sense, this study is aimed at seniors dependent in self-care, their informal caregivers, and health professionals from Portuguese nursing homes and emerged to assist elders’ self-care and their informal caregivers and to strengthen the communication strategies between the different elements of the target audience. Therefore, the design and development of an archetype of a new system is proposed, which main objectives are to accompany, teach, and share information between its users, taking into account safe medical validation and ethical issues, through emerging health ICT technologies. This archetype is a reinforcement, that is, a way to promote and complete the knowledge and skills to deal with elders’ well-being and health, as well as their informal caregivers’ welfare.

KEYWORDS

Augmented Reality, Business Intelligence, Caregivers, Collaborative Learning, Elders, Ethical Issues, Health ICT, mHealth, Nursing Homes, Self-Care, Telenursing, Web-Based Healthcare Solutions

INTRODUCTION

In the last years, a noticeable demographic change has been felt worldwide: in many countries, official statistics data show that the population is aging (Boll & Brune, 2016; Kuo, Wang, & Chen, 2016; Macis, Loi, & Raffo, 2016; Mostaghel, 2016; Sendra, Granell, Lloret, & Rodrigues, 2014), which leads to a tremendous increase of elderly care costs (Mostaghel, 2016). This situation poses several challenges to our society, and the topics of independence for the elderly become a critical situation (Kurz et al., 2014) increasingly, raising the need of ensuring multidisciplinary nursing teams, but also solutions that promote the potential of each dependent’s autonomy. The goal is, therefore, improving elders’ lifestyle quality in their home settings since older adults prefer to age in place, as well as their informal caregiver’s welfare (Mostaghel, 2016), (Beer & Takayama, 2011).

To deal with those major challenges, the scientific community has suggested applying health information and communication technology (ICT) to provide solutions to current issues associated with an aging population (Campos et al., 2016), particularly for the remote monitoring of seniors, which has been advocated as a concept that can radically transform and improve the delivery of healthcare (Bardhan & Thouin, 2013; Buntin, Burke, Hoaglin, & Blumenthal, 2011; Cresswell &
Sheikh, 2015; Lee, McCullough, & Town, 2013; Zhang et al., 2013). Advantages linked with health ICT include maintaining older adults’ independence, reducing healthcare needs and costs, providing remote assistance, and promoting social interaction (Beer & Takayama, 2011).

In this manuscript, the design and development of an archetype of a new system to support elders’ self-care and their informal caregivers is proposed, which main objectives are to accompany, teach, and share information between its users, taking into account safe medical validation (reliable information) and ethical issues. The novelty of this project lies in trying to fulfill the current lack of communication strategies to support the remote assistance by Portuguese nursing homes to the elderly and their informal caregivers using emerging technologies. Therefore, the research team firmly believes that rooting technological innovation into elders’ home care is an answer to support their self-care, but also to prevent their dependence and, thus, support older adults’ independence in a home context. On the other hand, the system will be a reinforcement to deal with seniors’ well-being and health and informal caregivers’ welfare by improving their lifestyle quality and promoting social interaction. Nonetheless, it is important to note that its goal will never be to replace any nursing services completely.

Regarding the structure of this document, Section “Background” is related to the research area of this project. After that, Section “Selected Technologies and their Main Advantages” presents a brief description of each technology chosen to develop the proposed system, as well as their main advantages. Section “Research Strategies” gives a brief description of the main research strategies selected to conduct this study. Then, Section “Results and Discussion” presents the results already achieved regarding the design and development of a new system to assist elders’ self-care and their informal caregivers, which are subsequently discussed in the same section. In Section “Conclusion and Future Work”, the conclusion and future work conclude this manuscript briefly.

BACKGROUND

The Promise of Health Information and Communication Technology to Support Older Adults

In recent years, the adoption of health information and communication technology, which consists of a set of computational solutions that allow the production, storage, transmission, access, and use of information, predominantly, through communication technologies in the healthcare industry (Buntin et al., 2011; Lindberg, Nilsson, Zotterman, Söderberg, & Skär, 2013), has been expanding dramatically (Finney Rutten et al., 2014; Mamlin & Tierney, 2016; Zhang et al., 2013). Although most current health ICT solutions are still immature, they are rapidly evolving, and a brighter future is expected (Mamlin & Tierney, 2016). Telenursing, Web-based healthcare solutions, and mobile health (mHealth) are some examples of emerging technologies resulting from health ICT.

Briefly, health ICT presents the potential to enhance individuals’ health and increase health knowledge and access to care (Buntin et al., 2011; Finney Rutten et al., 2014; Lee et al., 2013). Additionally, it can improve the performance of healthcare processes provided, namely in their efficiency and effectiveness, as well as in their significant reduction in cost, time, and medical errors (Buntin et al., 2011; Finney Rutten et al., 2014; Lee et al., 2013). Moreover, since social isolation is one of the most frequent and threatening issues for the independence and health of elders, communication technologies are important for promoting their independent living and social integration, overcoming social isolation, and improving their health, quality of life, and safety (Beer & Takayama, 2011; Campos et al., 2016).

Over the years, an increase in publications regarding the use of technologies to support the aging population was observed, which demonstrates the current and relevant interest of the scientific community in developing proposals for the wellbeing of elders (Campos et al., 2016). Moreover, elders surprisingly demonstrate a positive attitude and acceptance towards technological solutions when
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