Design and Implementation Framework of Pet-like Companion Robot Technology for Care of Older People: A Scoping Review

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1. Introduction

Nowadays, longevity studies have become a distinguished multidisciplinary field merging with cutting-edge computer science technologies to outline innovative ideas to cater to the needs of seniors. Since the global geriatric population is anticipated to rise, the number of people seeking to obtain caring services and wishing to be more actively engaged in life will be more apparent. A pet-like robot aiding to reduce human-based high-time pressure errors (such as in acute situations) would be a significant contribution to nursing homes that face staff shortages. Health care professionals can additionally dedicate more time for their patients with the helping hand of a robot, conceiving opportunities to enhance the quality of care of older people. Seniors requiring day-to-day special care in home settings, interested in improving their living standards can likewise benefit from an amiable companion. This review qualitatively examines the literature on the use of companion robots in care of older people to ascertain their operation in the future.

2. Methods

We utilised selected database libraries and promptly searched articles with relevant keywords. This review aims to implement a social constructivism view in combination with interpretivism, since the interaction between humans and robots will be shaping the overall model of the research. Moreover, the participants' issues and concerns, their emotional connections, and human-robot interaction concepts were investigated thoroughly.

3. Results

This scoping review resulted in the findings discussed as follows. Only a few studies have endeavoured to address the inter-individual competences coupled with the influence of anxiety in robot acceptance [1]. What is more, little research has been dedicated to the use of companion robots for people with cognitive impairment. Additionally, the size and aesthetic design of the robotic companion should be taken into account, as well, in order to elevate the acceptance of such technology [2]. In addition, rather less attention has been paid to address the language, gestures, knowledge and the traits of the social robots. Cultural differences, traditions and norms will impact the acceptance of robots for older people and it is an area for future research. A framework for robotic technologies must embrace defining and clarifying both the roles and responsibilities of the robots and how the person will accept to use it as they should [3].

4. Conclusions

To achieve such technological embracement, seniors need to be involved in the development phase, however, reports claim the concerns and needs are not clearly introduced and particularly identified in the design process. Therefore, a detailed research must be conducted to focus on such implications [4]. In an attempt to bring all these different perspectives into conversation, the researchers aim to create a culturally sensitive social robot design framework precisely tailored to meet older population's expectations. Eventually, the intended design would connect to smart home sensors with respect to Internet of Things technologies, gathering patient data in nursing home settings.

References

[1] Baisch S, Kolling T, Schall A, Rühl S, Selic S, Kim Z et al. Acceptance of Social Robots by Elder People: Does Psychosocial Functioning Matter?. International Journal of Social Robotics. 2017;9(2):293-307. DOI: 10.1007/s12369-016-0392-5

[2] Robinson H, MacDonald B, Broadbent E. The Role of Healthcare Robots for Older People at Home: A Review. International Journal of Social Robotics. 2014;6(4):575-591. DOI: 10.1007/s12369-014-0242-2

[3] Broadbent E, Stafford R, MacDonald B. Acceptance of Healthcare Robots for the Older Population: Review and Future Directions. International Journal of Social Robotics. 2009;1(4):319-330. DOI: 10.1007/s12369-009-0030-6

[4] Frennert S, Östlund B. Review: Seven Matters of Concern of Social Robots and Older People. International Journal of Social Robotics. 2014;6(2):299-310. DOI: 10.1007/s12369-013-0225-8