Chapter 2
CLARC:
Robotic Platform to Assist the CGA Evaluation in Elderly Patients

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ABSTRACT

The increasing ageing of the European population is an unstoppable process causing more and more demand for health and social assistance resources. The Comprehensive Geriatric Assessment (CGA) is an indispensable tool to identify the psychosocial and functional limitations of geriatric patients. The problem is that the CGA process is very long and demands a lot of time from health professionals. It is necessary to develop a robotic platform that helps in CGA. In this sense, Clarc is a mobile robot developed to help the physician to capture and manage their data during CGA procedures. The robotic platform was tested in some healthcare centers and results show elderly participants accepted the technology. Clarc is a tool that facilitates the work of health professionals given the ease of access to patient data and their evaluations, freeing these professionals to focus their activity on purely clinical tasks that require their knowledge.

INTRODUCTION

The ageing of the world's population is already a reality and a worrying legacy for upcoming genera-tions. The percentage of people over the age of 65 is increasing year by year and it seems that this trend will not cease in the coming decades (Bengtson, 2018). Nowadays and since the past 6 decades, there is a remarkable increase in life expectancy, especially in industrialized societies. European countries have the most aged populations. Moreover, Bengtson (2018) indicates that "during 2000, the world's elderly population (aged 65 and over) grew by more than 795,000 people a month". Furthermore, he indicates that "the current growth rate of the elderly population in the developing countries is expected to rise to above 3.5 percent annually from 2015 through 2030".

Health resources such as health care are becoming more and more necessary but at the same time limited. In the last few decades, life expectancy has risen, which has led to an increase of the appearance of multiple comorbidities, while there are fewer active people who can care for them. This is caused by the coexistence of the older population and the ageing of the working population, as well as by the decline in the working-age population. In addition to all these factors, there is an important decrease of the infant mortality, an increase in the birth rate and a significant improvement in health systems (Rodriguez, 2014).

Older people make greater use of social and health services and therefore generate greater expendi-ture both financially and in terms of resources themselves. This is the reason why, for this age group, a change in the model of health care is needed, in which medical conduct is established that employs great efforts in the prevention and early detection of diseases and functional impairments. Therefore, an early assessment of the overall health status of older people as early as possible is crucial to prevent as much as possible age-related deterioration.

Want et al. (2014) pointed out that certain protective factors may act reducing the negative conse-quences old age and improving their quality of life, such as physical and cognitive activities practices, a healthy social and relative environment, etc. To consider all these aspects, besides the traditional medical evaluation, a different multidisciplinary and more holistic approach has been developed: The Comprehensive Geriatric Assessment (CGA).

The CGA is a multidimensional tool used to assess and identify the needs of frail elderly patients on the basis of which a personalized care plan can be developed. CGA is a widely used method because, in addition to providing detailed clinical, functional and cognitive data on older patients, it provides information on non-medical aspects such as economic and socio-environmental conditions, which allows the creation of a holistic view of the reality of the older person (Rubenstein, 2004).

In this sense, according to the findings of Stuck and Iliffe (2011), patients over 75 years of age who received a comprehensive geriatric evaluation in a home visit could reduce functional status impair-ment and avoid an early admission to nursing homes. In addition, the article points out that hospitalized patients who received an CGA were significantly less likely to die or experience functional impairment. From an economic perspective, therefore, in the long term, CGA, in addition to significantly improving patient status, offers cost savings by reducing hospital readmissions and reducing the need for long-term care in these nursing homes.

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