

The application of technologies in dementia diagnosis and intervention: A literature review

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E. Brando, R. Olmedo, C. Solares. The application of technologies in dementia diagnosis and intervention: A literature review. Gerontechnology 2017;16(1):1-11; doi:10.4017/gt.2017.16.1.001.00 The use of technology on dementia patients' behavioral treatments has been a growing area of interest in recent years. The aim of incorporating technological devices into dementia behavioral treatments and interventions is to support patients in their everyday life activities, maintain or alleviate some of the cognitive and behavioral symptoms and foster social interaction. The objective of this review is to know how technology has been incorporated into work with dementias, to explore the advantages and disadvantages found, and to generate a theoretical discussion that allows to propose future lines of work. In doing so, a total of 30 original studies and theoretical reviews or meta-analyses were analyzed to understand the role of technology in several stages of dementia diagnosis and treatment, but also to explore whether technology has been used as a tool for working with dementia caregivers and relatives.

Keywords: dementia, technology, dementia caregivers, cognitive intervention

In recent years, there has been a growing interest in incorporating technology into dementia behavioural treatments and interventions in order to support patients in their everyday life activities, improve their temporal, personal, and spatial orientation, and foster social interaction¹. For instance, the use of assistive technology (AT) as well as information and communication technologies (ICTs) have been proposed as a relevant aid for the everyday life of dementia patients in several aspects such as behaviour, cognition, and functionality. Some types of AT have been included in the treatment of dementia patients as a support tool intended to facilitate complex activities such as cooking or hand washing^{1,2}.

Furthermore, technology makes it easier to provide personalized and effective interventions in terms of cost and time, which promote health and allow professionals to meet the needs of patients with progressive diseases such as dementias³. Technology also offers the possibility of adapting the parameters of a task according to the patients' performance, which improves their motivation by reducing frustration and boredom⁴. On the other hand, the use of technology in cognitive interventions makes it possible to treat patients remotely, which fosters work with rural populations who lack access to rehabilitation specialists.

Several software packages have been used as

non-pharmacological alternatives in dementia treatment; for example, existing video games. Others have been specially created upon the basis of specialized guidelines; also, video games have been generated as reproductions of existing pen and paper interventions⁵⁻⁷.

Virtual reality-based technology (VR) has been also included in dementia intervention programs. In fact, several studies highlight that VR intervention programs foster ecological validity, because they create fictional contexts based on real situations that make it possible for patients to transfer the learning acquired during the intervention to their everyday life⁷⁻⁹.

Technology has also been incorporated into the process of evaluation and detection of cognitive decline through the design of digital platforms, generally for personal computers or tablets, which allow professionals to obtain an overview of a person's cognitive functioning^{10,11}. The use of technology facilitates access to instruments for assessing neurocognitive disorders, because most of them do not require the participation of a specialist and provide a first snapshot of cognitive alterations, thus contributing to early detection¹².

Technology is not limited to the patient's treatment but also to caregivers' interventions¹³. Multiple studies have focused on the creation of psy-