

Chapter 60

Fostering Daily Life Skills in Young and Older Adults With Neurodegenerative Diseases Through Technological Supports

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ABSTRACT

Persons with neurodegenerative diseases may have behavioral, cognitive, emotional, motor, and social impairments due to their clinical conditions. The objective of this article is to provide the reader with the newest empirical contributions available and a comprehensive critical overview on the use of assistive technology-based interventions and virtual reality-mediated setups to assess and recover individuals with neurodegenerative diseases. A literature overview was carried out. Thirty-one studies published along last decade were selected. The retained studies overall recruited 438 participants. Four categories of studies were identified, namely (1) recovering of functional and physical activities, (2) communication abilities, (3) leisure and recreation, and (4) virtual reality. AT-based interventions were effective and suitable to promote adaptive behaviors of patients with neurodegenerative diseases. VR setups were helpful to assess and recover persons with neurodegenerative disorders.

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INTRODUCTION

Young and older adults with neurodegenerative diseases (e.g., Alzheimer disease, Parkinson disease, amyotrophic lateral sclerosis and multiple sclerosis) may present intellectual, motor, communicative, emotional, and social impairments while coping with their environment. Because of their relevantly compromised clinical conditions, people with significant disabilities frequently experience isolation, passivity, and detachment with negative outcomes on their quality of life. That situation may seriously hamper their social image, desirability, and status. In fact, they constantly rely on caregivers' assistance (Bassi et al., 2020). To profitably tackle this issue, one may resort on assistive technology-based programs (AT). Such approach includes basic supports for helping individuals with relevant disorders within daily settings. AT-based interventions are envisaged to fill the existing gap between the individual's capacities and the environmental's requests. Furthermore, they may build a functional link ensuring the independence of persons with different level of disabilities and reducing caregivers' burden accordingly (Lancioni et al., 2019). Thus, an active role, constructive engagement, and leisure opportunities of persons with neurodegenerative disorders may be fostered (Soriani & Desnuelle, 2017).

AT-based strategies may provide people affected by different neurodegenerative diseases and various levels of disabilities with a valid support in essential problem domains. For instance, independent access to positive stimulation, functional activities, physical exercise, reminiscence, communication skills, leisure and recreation, request and choice processes are commonly embedded (Stasolla, Perilli, & Boccasini, 2016). The area of detachment and passivity encompasses the incapacity of being favorably committed in adaptive behaviors and/or physical activities with beneficial consequences. Functional activities may be considered as crucial for occupational purposes. Communication skills and reminiscence are essential for social interaction and recovery of personal events. Leisure and recreation domains include the inability of manage leisure or recreation opportunities autonomously. Request and choice processes refer to the awareness of select and ask for desired items (Lancioni & Singh, 2014). AT-based interventions are designed to provide devices, equipments or tools aimed at reducing the distance between the individual's skills and the requested skills for pursuing specific objectives. It is critical that the AT-based option is customer tailored and rigorously individualized. Specifically, a person with neurodegenerative diseases and multiple disorders may enhance self-determination through AT-based solutions (Lancioni, Sigafoos, O'Reilly, & Singh, 2012).

Beside the aforementioned approach, virtual reality (VR) may be considered for assessment and rehabilitative purposes. In fact, VR offers meaningful merits in terms of ecological validity, experimental control, and tracking for behavioral responses. Thus, persons with neurodegenerative diseases may be assessed and recovered for both cognitive and motor functions through VR settings (Diersch & Wolbers, 2019). Moreover, VR may be used for both experimental and clinical pain relief (Matamala - Gomez et al., 2019). Otherwise, VR is viewed as a new rehabilitative tool with a possible added value over traditional physiotherapeutic approaches because it may potentially optimize motor learning and replicate real-life scenarios, which improve functional activities of daily life. Furthermore, it provides the participant with suitable and ecological (i.e., similar to real life) conditions (Dockx et al., 2016).

Although a substantial body of literature exists for both practical and clinical area of investigations (AT and VR; Belic et al., 2019), none of the available review papers presents a combination of both areas. Additionally, the published reviews are exclusively focused on a specific disease (e.g., Parkinson or sclerosis) rather than provide the reader with a comprehensive review targeted on different neurodegenerative diseases. The importance to merge both approaches could be to emphasize an inclusive way

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