

Chapter 10

Assistive Technology–Based Programs and Telerehabilitation Strategies to Support Adaptive Responding of Individuals With Neurodegenerative Diseases

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ABSTRACT

Individuals with neurodegenerative diseases (NDD) may pose serious challenges to daily life medical contexts. In fact, they commonly fail while dealing with environmental requests. To overcome this issue, one may rely on assistive technology-based programs. The COVID-19 pandemic suddenly exacerbated their clinical conditions. Telerehabilitation may be useful to profitably tackle the latter issue. A concise survey on the newest empirical contributions available was proposed. Five main categories of studies were identified. Results were satisfactory, although failures occurred. Findings were critically discussed and some useful insights for both research and practice were highlighted.

INTRODUCTION

Young and older adults with neurodegenerative diseases (e.g., Alzheimer disease, Parkinson disease, amyotrophic lateral sclerosis and multiple sclerosis) may pose serious challenges to daily contexts such as families, caregivers, professionals, and medical or rehabilitative centers. Thus, they commonly exhibit communicative, emotional, intellectual, motor, and social impairments while tackling day life requests.

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Because of their significantly compromised clinical conditions, individuals with severe disabilities frequently experience isolation, passivity, and detachment with negative consequences on their quality of life. That situation may be meaningfully deleterious for their social image, desirability, and status. In fact, they constantly rely on caregivers' assistance (Bassi et al., 2020; Gil-Gonzales, Perez-San-Gregorio, Conrad, & Martin-Rodriguez, 2021; Schischlevskij et al., 2021). To positively address this issue, one may rely on assistive technology-based programs (AT). Such approach includes basic aids to support people with relevant disorders within daily settings. AT-based interventions are implemented to fill the existing gap between the individual's capacities and the environmental's requests. Moreover, AT may build a functional bridge enabling self-determination of persons with different levels of disabilities and decreasing caregivers' burden accordingly (Behera, Condell. Dora, Gibson. And Leavy, 2021; Gongora Alonso et al., 2019). Thus, an active role, constructive engagement, and functional occupation of individuals with neurodegenerative disorders may be enhanced (Leuty, Boger, Young, Hoey, & Mihaillidis, 2013; Savvidis et al., 2018).

Recently, Covid-19 pandemic drastically exacerbated the precarious conditions of persons with neurodegenerative diseases (NDD) due to quarantine and social distancing preventive measures. Additionally, the unavailability of National Medical Services reduced the opportunity in NDD people to receive adequate medical care. The diffusion of the vaccine partially improved that situation. To overcome this latter issue, one may use telerehabilitation strategies (TR) (Akbas & Mummolo, 2021; Capri et al., 2021).

For example, Hung and Fong (2019) reviewed the current literature on the application of TR in occupational therapy practice and its clinical outcomes over last decade. Studies retrieved from seven electronic databases were assessed and findings evidenced positive therapeutic effects although data were considered insufficient to demonstrate the validity of TR compared to face – to – face interventions. Capri et al. (2021) systematically reviewed the literature on the use of TR in individuals with multiple disabilities, and examined the effects of TR on adaptive skills of individuals with severe to profound and multiple delays. Furthermore, the different types of devices and families' satisfaction were assessed. Nevertheless, by including AT, NDD, and TR in Scopus, no records were found.

In light of the above, the first goal of the chapter was to provide the readers with an update and concise survey on the use of AT-based programs and TR to promote cognitive, communicative, and motor functions in persons with NDD. Positive participation and leisure opportunities were additionally examined. The second objective of the chapter was to emphasize advantages and limitations of the adopted technological solutions. Finally, some useful insights for both future research and practice were critically discussed.

1. BACKGROUND

AT-based strategies may provide persons diagnosed with different neurodegenerative diseases and various levels of disabilities with a valid aid in basic problem domains. For instance, independent access to positive stimulation, functional activities, physical exercise, reminiscence, communication skills, leisure and recreation, request and choice processes are frequently included (De Pace & Stasolla, 2014; Stasolla, Perilli, & Boccasini, 2016). Furthermore, the area of detachment and passivity encompasses the difficulty 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

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