Understanding digital technology usability in home-based neurorehabilitation: A realist review

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Purpose In the realm of gerontechnology, the integration of digital technology into the management of neurological disorders holds promise, especially for the aging population requiring intensive rehabilitative care in both clinical and home settings. While prior research has informed the advantages of digital rehabilitation platforms for specific populations such as stroke survivors and children with disabilities, the current underutilization of these technologies at home indicates barriers related to their usability in terms of effectiveness, efficiency, and satisfaction (ISO 9241-11, 2018). Our study aims to understand the usability of digital technologies for home-based rehabilitation in older adults with neurological conditions, thus determining essential factors that could influence their implementation. **Method** We conducted a realist review complemented by expert consultations, adhering to realist review principles (Pawson & al., 2005) and the RAMESES I publication standards (Wong & al., 2013). An initial program theory (figure 1) was developed based on multiple frameworks and established theories to explain the extent of which certain technologies are usable for home neurorehabilitation for older adults. This program theory was reviewed and refined through focus group discussions with five research experts in gerontechnology or realist review methodologies. Their insights were crucial for validating the framework and recommending enhancements. We are currently examining literature from 2015 to 2023 across various databases and grey literature, using the Context-Mechanism-Outcome configuration analysis (CMOC) (Pawson et al., 2005) to further test this program theory. We focus on understanding how the home setting activates mechanisms that influence technology's usability for older adults with neurological conditions. Each CMOC extracted could reinforce or challenge aspects of our program theory, thereby testing and adjusting it to better reflect the reality of technology usability. A second consultation with users, clinicians, and researchers is planned to validate the updated theory based on their experiences. This process aims to lead to a middle-range theory that is specific enough to guide the usability of certain technologies at home and general enough to apply across different situations, such as various technologies or neurological conditions. **Results and Discussion** An initial program theory explaining the usability of digital technologies for home neurorehabilitation of older adults was developed and validated by field experts. A screening of 4,708 references led to 137 key articles selected for extraction. The resulting middle-range theory details mechanisms triggered by the home setting, offering actionable guidelines for practical implementation of new digital technologies for rehabilitation at home. The findings underscore the critical role of technology in improving quality of life for older adults by facilitating effective, efficient, and satisfying home-based rehabilitation solutions.

References

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Keywords: usability, digital technology, rehabilitation, neurological conditions, home

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Acknowledgement: This research was supported by Université de Montréal (UdeM) and Centre for Interdisciplinary Research in Rehabilitation of Greater Montreal (CRIR)

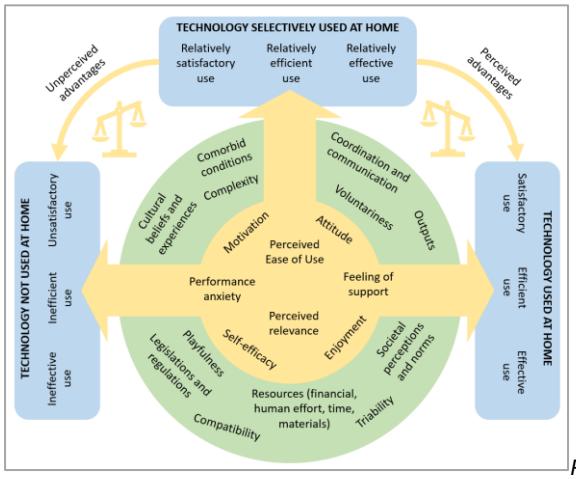

Figure 1. The initial program theory