Aged Care Research & Industry Innovation Australia

Evidence Theme

Technology

REHABILITATION, REABLEMENT, & RESTORATIVE CARE

This evidence theme is a summary of one of the key topics identified by a scoping review of rehabilitation, reablement, and restorative care research.

Key points

- Integrating telehealth into rehabilitation, reablement, and restorative care may improve the planning and delivery of care to older people residing in aged care. Technology might also be an effective means to disseminate information to people and their carers, and provide ongoing support, especially during periods of care transition.
- Evidence exists to support the use of exergames and virtual reality to improve walking capacity, function, and cognition in aged care settings; however, the quality of available evidence is low, and further high-quality research is required.

What technology is used in rehabilitation, reablement, and restorative care?

This review identified a range of technologies used in aged care settings for restorative purposes. These include eHealth, exergames, virtual reality, telehealth, and smart homes with home health monitoring technologies. Definitions of these approaches and interventions are provided on the next page.

eHealth

eHealth is an umbrella term for information and communication technology that supports health and healthcare.

Exergames

Exergames are video games that include a form of exercise, they track body movement and reactions. Exergames have the potential to mimic settings that are similar to actual environments, allowing older adults to practice tasks in a safe space. [1]

Virtual reality

Virtual reality or VR is delivered using headsets that fully immerse the user and allows for the practice of physical, mental, and psychosocial health outcomes. [2]

Telehealth

Telehealth is the delivery of health or medical treatment using digital communication technologies such as computers and mobile devices. [3]

Smart homes and home health monitoring technologies

The term 'smart home' refers to a residence with integrated sensors that monitor inhabitants. These health monitoring technologies can include automated temperature control and the use of appliances and other technologies to support health and maintain well-being. [4]

What do we know about the use of technology in rehabilitation?

We found 12 systematic reviews [2-5, 7-9, 10-15] reporting technology use for rehabilitation, reablement, and restorative care services. The most common technological interventions used were virtual reality, [2, 5] exergaming including the use of games on the Nintendo Wii and Microsoft Kinect, [6, 7] and telehealth for communication and service delivery. [8, 9] The other reviews provided an overview of eHealth in rehabilitation, [10] home health monitoring technologies, [11] reablement interventions that included technology, [12] and combined virtual reality with exergames. [13]

eHealth in reablement and rehabilitation

The evidence showed that:

- eHealth interventions can potentially improve rehabilitation outcomes for older patients. The use of simple eHealth interventions was more likely to be feasible for older patients receiving geriatric rehabilitation; however, the lack of evidence on usability and participation needs to be addressed. [10]
- Technological interventions are commonly used to increase physical activity levels in older adults. [12]

Telehealth

Reviews on telehealth identified that:

- Telehealth interventions were adopted and perceived positively by older adults using aged care services. However, continued reliance on paper-based systems and the use of outdated technology to communicate with patients were problematic. [14]
- Telecommunications, video conferencing, and messaging services could be incorporated into care planning and delivery to reduce barriers to care. Barriers may include problems of distance for rural populations, time restraints, and periods of transition between care services. [8, 15]
- Support and training for older adults and family carers before setting up telehealth services is required to successfully integrate these technologies. [9]

Home health monitoring technologies

- Home health monitoring technologies have the potential to reduce undesired health outcomes such as sedentary behaviours and nutritional intake for older adults. They can also assist those with complex needs to stay in their own homes. However, technological readiness is a consideration as it can be low for some older adults. [4, 11]

Exergames

- Exergames can have a positive impact on the walking capacity of older adults but the evidence for this is weak. We need higher-quality research to confirm this finding. [6]
- The Nintendo Wii can have a positive impact on the physical and mental health of older adults living in care facilities, but additional research should be carried out to determine the effectiveness of different games that display potential for use in aged care facilities. [7]

Virtual reality

- Virtual reality technologies can provide effective interventions to improve the functional mobility of older adults when compared with usual care. However, low methodological quality means that further research is required to determine effectiveness. [5]
- Virtual reality with a head-mounted display led to improvements in pain management, posture, and cognitive function. It also decreased the risk of falls for community-dwelling older adults. These findings are promising but limited by the lack of understanding of delivery, financial implications, and acceptability of the technology for older adults. [2]
- Virtual reality combined with exergames was commonly used for balance exercises. It improved cognitive outcomes for older adults compared to conventional exercise programs. [13]

What can an individual do?

- Consider how integrating technology into rehabilitation, reablement, and restorative care may assist older adults receiving aged care services.
- Increase awareness of the use of innovative technologies in rehabilitative services
- Give support to research that considers the research design, features, and delivery of technology interventions capable of promoting health outcomes for older adults.

What can the organisation do?

- Use technology to facilitate communication and disseminate knowledge to service users.
- Supplement face-to-face communication and rehabilitative services with appropriate online communication tools and information technology.
- Integrate and develop online resources that detail the recovery process and improve communication for older adults transitioning between care services.

References

1. van Diest M, Lamoth CJC, Stegenga J, Verkerke GJ, Postema K. Exergaming for balance training of elderly: State of the art and future developments. J Neuroeng Rehabil. 2013;10(1):101.
2. Dermody G, Whitehead L, Wilson G, Glass C. The role of virtual reality in improving health outcomes for community-dwelling older adults: Systematic review. J Med Internet Res. 2020;22(6):e17331.
3. Australian Digital Health Agency. Telehealth [Internet]. 2022 [cited 2023 Jul 1]. Available from: https://www.digitalhealth.gov.au/initiatives-and-programs/telehealth
4. Liu L, Stroulia E, Nikolaidis I, Miguel-Cruz A, Rios Rincon A. Smart homes and home health monitoring technologies for older adults: A systematic review. Int J Med Inform. 2016;91:44-59.
5. Corregidor-Sanchez AI, Segura-Fragoso A, Rodriguez-Hernandez M, Jimenez-Rojas C, Polonio-Lopez B, Criado-Alvarez JJ. Effectiveness of virtual reality technology on functional mobility of older adults: Systematic review and meta-analysis. Age Ageing. 2021;50(2):370-9.
6. Corregidor-Sanchez AI, Segura-Fragoso A, Rodriguez-Hernandez M, Criado-Alvarez JJ, Gonzalez-Gonzalez J, Polonio-Lopez B. Can exergames contribute to improving walking capacity in older adults? A systematic review and meta-analysis. Maturitas. 2020;132:40-8.
7. Marston HR, Greenlay S, van Hoof J. Understanding the Nintendo Wii and Microsoft Kinect consoles in long-term care facilities. Technology & Disability. 2013;25(2):77-85.
8. Asif M, Cadel L, Kuluski K, Everall AC, Guilcher SJT. Patient and caregiver experiences on care transitions for adults with a hip fracture: A scoping review. Disabil Rehabil. 2020;42(24):3549-58.
9. Kirchhoff R, Berg H. Use of video communication technology in the light of everyday and/or tele rehabilitation. Sykepleien Forsk. 2016;11(2):174-83.
10. Kraaijkamp JJM, van Dam van Isselt EF, Persoon A, Versluis A, Chavannes NH, Achterberg WP. eHealth in geriatric rehabilitation: Systematic review of effectiveness, feasibility, and usability. J Med Internet Res. 2021;23(8):e24015.
11. Boland L, Légaré F, Becerra Perez MM, Menear M, Garvelink MM, McIsaac DI, et al. Impact of home care versus alternative locations of care on elder health outcomes: An overview of systematic reviews. BMC Geriatr. 2017;17:1-15.
12. Lewis LK, Henwood T, Boylan J, Hunter S, Lange B, Lawless M, et al. Re-thinking reablement strategies for older adults in residential aged care: A scoping review. BMC Geriatr. 2021;21(1):667.
13. Chen PJ, Hsu HF, Chen KM, Belcastro F. VR exergame interventions among older adults living in longterm care facilities: A systematic review with meta-analysis. Ann Phys Rehabil Med. 2022:101702.
14. Davis J, Morgans A, Stewart J. Developing an Australian health and aged care research agenda: A systematic review of evidence at the subacute interface. Aust Health Rev. 2016;40(4):420-7.
15. Glenny C, Stolee P, Sheiban L, Jaglal S. Communicating during care transitions for older hip fracture patients: Family caregiver and health care provider's perspectives. Int J Integr Care. 2013;13(4):e044-e.

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