Department of Occupational Therapy, College of Public Health and Health Profession

Effectiveness of technology-based interventions on visual recovery and functional outcomes in stroke patients with visual deficits – a rapid systematic review

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BACKGROUND

- Vision deficits affecting visual scanning, perception, acuity, convergence and tracking have a major impact on independence for ADLs and IADLs (Liu & Chang, 2020).
- Visual deficits and changes in vision are present in 65% of individuals who have had a stroke (American Stroke Association, 2023) and 39.8% of individuals with moderate to severe TBI (Merezhinskaya et al., 2019).
- Technology-based visual interventions are widely used but not always linked to functional return of vision regarding engagement in occupations.

AIMS

- Examine the effectiveness of technology-based interventions for visual rehabilitation post-stroke.



METHODS

- A systematic rapid review
- Three databases were searched during June 2024: PubMed, PsychoINFO, and CINAHL.
- Key search terms: stroke, visual deficit, technology, virtual reality, and lower vision devices.
- Inclusion: within the last 10 years; must include adults with stroke and visual deficits and assess the effectiveness of a technology-based intervention.
- Title and full text screening using Covidence.
- Extraction: a standard form. One author extracted, another. Revise PEDRo scale for quality assessment.
- Synthesizes matrix: title, participant information, type of intervention, functional outcomes, and conclusions

RESULTS

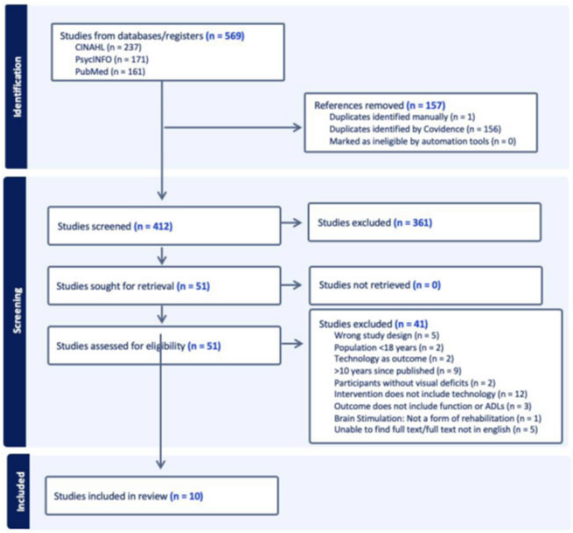


Figure 1. PRISMA diagram flow of the search results

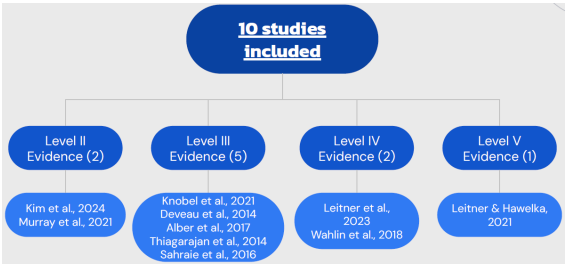


Figure 2. Levels of evidence of the included studies

Treatment modality

- Computer-Based Intervention of a More Standard Treatment Approach: two level II and two level III studies showing significant improvements in visuospatial perception, visual field and attention, and visual memory
- High-Tech Individualized and Adaptive Programs: three using visual restitution training and three using adaptive video-game based approach with mixed findings.

Treatment dosage

- Treatment dosage refers to the total number of training sessions, including hours per day, times per day, times per week, and total number of weeks
- High dosage: five studies showing positive outcomes
- Low dosage: five article showing positive outcomes

Settings

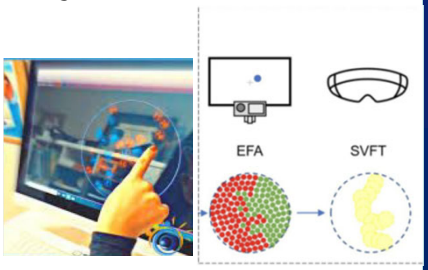
- 8/10 studies took place in the clinic: Improvements in either visual field, central and peripheral acuity, visuospatial attention, visual scanning, visual neglect, and symptoms of saccades
- 2/10 studies took place in the home environment: mixed findings

CONCLUSIONS

- Review offers a preliminary answer to the effectiveness of technology, and it would often need to be used to improve visual deficits.
- Only 10 articles in review: sparse information on technology-based interventions and their role in functional recovery for activities of daily living.

KEY TAKEAWAYS

- For individuals with visual deficits from either a stroke or a TBI, technology-based interventions, specifically simple computer can demonstrate restoration of visual function, closer to PLOF.
- Addressing vision through innovative technology-based interventions shows improved visual outcomes, but more traditional methods of treatment could also help to reduce her burden of visual neglect.



Scan the QR code for references

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