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## Integrating virtual reality-based physiotherapy into post-stroke rehabilitation: Innovations from an Australian Clinical Trial

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**Statement:** Post-stroke rehabilitation remains a global challenge, with many patients experiencing limited access to intensive therapy. Virtual Reality (VR)-based physiotherapy offers an immersive, engaging, and potentially cost-effective approach to enhance neuroplasticity and functional recovery. This study aimed to evaluate the efficacy of VR-integrated physiotherapy in improving motor outcomes and patient engagement among post-stroke patients in Australia.

**Methodology:** A randomized controlled trial was conducted at three major rehabilitation centers across Sydney, enrolling 120 post-stroke patients aged 45–75 years. Participants were randomly assigned to a VR-assisted physiotherapy group (n=60) or conventional physiotherapy group (n=60). Both groups received five weekly sessions over 10 weeks. The VR group engaged in simulated upper and lower limb training using interactive software with real-time feedback. Functional outcomes were measured using the Fugl-Meyer Assessment, Berg Balance Scale, and patient-reported motivation scores. Follow-up was conducted at 3 and 6 months post-intervention.

**Conclusion:** The VR-assisted physiotherapy group showed statistically significant improvements in motor function (Fugl-Meyer scores increased by 27%) and balance (Berg Scale scores improved by 22%) compared to the control group ( $p < 0.01$ ). Patient motivation scores were notably higher in the VR group, reflecting improved engagement and adherence. These findings underscore the potential of VR as an adjunct to traditional physiotherapy, particularly in enhancing neurorehabilitation outcomes and addressing the growing demand for innovative, patient-centered rehabilitation methods in Australia and beyond.

### Biography

Olivia Harper is a senior physiotherapist and researcher at the University of Sydney, Australia. With over 15 years of clinical experience in neurorehabilitation, she holds a Ph.D. in Movement Science and Rehabilitation. Dr. Harper's work focuses on integrating digital technologies, including VR and tele-rehabilitation, into clinical practice. She has led multiple funded trials and published extensively in the field of neurological physiotherapy. Passionate about innovation, she is committed to advancing accessible and evidence-based rehabilitation solutions globally.

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