

Effect of Virtual Reality (VR) on Gait and Balance in Chronic Stroke Patients: A Narrative Review

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ABSTRACT

Background: Stroke causes sudden, focal (or global) cerebral function disturbance lasting over 24 hours. It is the second leading cause of death globally and a major cause of disability. Stroke rehabilitation often includes conventional therapies for lower limb impairments, but motivation remains a challenge. Virtual Reality (VR) technologies, such as immersive, non-immersive, augmented, gamified, and mobile VR, enhance patient engagement and feedback compared to traditional methods.

Objective: To evaluate the effects of VR on gait and balance in chronic stroke patients.

Inclusion Criteria: Reviews published from 2019-2025, involving adults (18-85 years) diagnosed with chronic stroke and treated with VR (immersive, semi-immersive, or non-immersive), alone or combined with conventional therapy. The primary outcome was gait and balance.

Methods: Articles (2019-2025) were sourced from PubMed, Google Scholar, Scopus, PEDro, HINARI, and Cochrane Library using keywords like VR, rehabilitation, gait, and balance. Of 36 initial articles, 15 met inclusion criteria.

Results: Studies showed significant improvement in balance and leg strength using VR. Stroke patients with immersive head-mounted displays demonstrated slower cadence, altered stance, and swing times. VR training, being intensive, engaging, and varied, provided realistic and safe simulations for daily activities.

Conclusion: VR, alongside conventional therapy, significantly improves gait, balance, trunk control, and functional mobility in chronic stroke patients, though it lacks real-life applications compared to game-based simulations.

Keywords: Chronic stroke, Functional mobility, Gait and balance, Rehabilitation

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