Robotic-assisted range of motion therapy on limb muscle tone in chronic stroke patients: A systematic review

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Abstract	Background: Stroke is a sudden neurological deficit that arises from vascular damage in the central nervous system, which can lead to disabilities, particularly affecting the movement capabilities of those impacted. While often associated with older adults, the occurrence of stroke in younger individuals has risen in recent years. The disabilities that result from strokes in younger adults can contribute to economic challenges and a reduced quality of life. To mitigate the functional limitations caused by stroke, interventions such as Robotic Range of Motion (ROM) can be utilized, taking advantage of technological advancements. Robotic ROM techniques can improve muscle tone in the limbs, and it is anticipated that consistent ROM interventions will effectively alleviate movement restrictions in these areas.Top of FormBottom of Form Purpose: To identify robotic-assisted range of motion therapy on limb muscle tone in chronic stroke patients. Method: A systematic review approach in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Articles were sourced from online databases such as PubMed, Google Scholar, and ProQuest. The review was organized according to the PICOS framework. In this article, the PICOS criteria were defined as follows: P: Stroke patients, I: Range of Motion (ROM) exercises using robotics, C: Inclusion of a control group, O: Improvement in muscle tone, S: Randomized Controlled Trial (RCT). The keywords used in the search included Ã¢Â€Âœrange of motion,Ã¢Â€Â Ã¢Â€Âœrobotic intervention,Ã¢Â€Â Ã¢Â€Âœmuscular tone,Ã¢Â€Â and Ã¢Â€Âœstroke patient.Ã¢Â€Â Articles were selected based on specific inclusion criteria: publication within the last five years (2019-2024), English language, use of robotics in interventions, focus on stroke patients, application of randomized controlled trial research methods, and availability of the full text. Results: The literature review of the five journals revealed that Robotic ROM interventions are effective in enhancing muscle tone in stroke patients. This conclusion is backed by clinical evidence gathered from the analysis of these journals. Conclusion: Based on the analysis of the five articles, it is evident that ROM intervention utilizing robotics through various methods positively affects the extremities of stroke patients.
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