

Exploring Error-Minimization Protocols for Upper-Limb Function During Activities of Daily Life in Chronic Stroke Patients

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Abstract : Objectives: The current study is done in preparation for a randomized controlled study investigating the effects of an implicit motor learning protocol implemented using an extension-supporting glove. It will explore different protocols to find out which is preferred when studying motor learning in the chronic stroke population that struggles with hand spasticity. Design: This exploratory study will follow 24 individuals who have a chronic stroke (> 6 months) during their usual care journey. We will record the results of two 9-Hole Peg Tests (9HPT) done during their therapy sessions with a physiotherapist or in their home before and after 4 weeks of them wearing an extension-supporting glove used to employ the to-be-studied protocols. The participants will wear the glove 3 times/week for one hour while performing their activities of daily living and record the times they wore it in a diary. Their experience will be monitored through telecommunication once every week. Subjects: Individuals that have had a stroke at least 6 months prior to participation, hand spasticity measured on the modified Ashworth Scale of maximum 3, and finger flexion motor control measured on the Motricity Index of at least 19/33. Exclusion criteria: extreme hemi-neglect. Methods: The participants will be randomly divided into 3 groups: one group using the glove in a pre-set way of decreasing support (implicit motor learning), one group using the glove in a self-controlled way of decreasing support (autonomous motor learning), and the third using the glove with constant support (as control). Before and after the 4-week period, there will be an intake session and a post-assessment session. Analysis: We will compare the results of the two 9HPTs to check whether the protocols were effective. Furthermore, we will compare the results between the three groups to find the preferred one. A qualitative analysis will be run of the experience of participants throughout the 4-week period. Expected results: We expect that the group using the implicit learning protocol will show superior results.

Keywords : implicit learning, hand spasticity, stroke, error minimization, motor task

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