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Usability of Functional Electrical Stimulation on Upper Limb Rehabilitation of Subacute Stroke: A Literature Review

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ABSTRACT

Introduction: Stroke is one of the leading cause of long-term disability, often resulting in significant impairments in motor function, especially in the upper limbs. Sub-acute stroke, defined as the phase occurring between 1 and 6 months post-stroke, is a critical period for rehabilitation, as patients have the potential for a significant recovery.

It has been discovered from numerous studies that Functional Electrical Stimulation (FES) helps the hemiplegic upper limb patients to improve the motor function by stimulating the muscles using electrodes on or near the innervating nerve fibres.

Aim: The aim of the study is to present comprehensive review regarding the usability of FES in upper limb rehabilitation of subacute stroke patients.

Materials and Methods: Research literature published from 2008 to 2024 was searched in Google scholar, Web of science, Scopus, EBSCO, PubMed databases with FES, upper limb rehabilitation and subacute stroke patient as keywords. A total of articles 300 were identified initially. On the basis of predefined inclusion and exclusion criteria, non English articles and duplicates were excluded. A total of 10 articles were included that met the specified criteria.

Results: Several studies included did not assess the quality of movement as an outcome to assess the role of FES in upper limb rehabilitation of subacute stroke patients. In this context of the applicability of the FES as a tool that contributes to enhancing the quality of movement of the post-stroke subject, it is important to consider the concept of usability as a determining factor.

Conclusion: This literature review concludes FES plays an important role to improve muscle strength, motor control, and functional independence makes it a promising intervention for optimising recovery during the critical sub-acute phase. While more research is needed to establish standardised treatment protocols and identify the most effective approaches, the current evidence supports FES as an effective tool in stroke rehabilitation and a promising area for continued investigation.

Keywords: Critical period for rehabilitation, Quality of movement, Stroke rehabilitation tool.