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The Role of Transcranial Direct Current Stimulation in Managing Pain and Enhancing Mobility in Knee Osteoarthritis: A Narrative Review

Yashasvi Parmar, MPT Student, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India.
Sunita Sharma, Associate Professor, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India.
Vanshika Uppal, MPT Student, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Yashasvi Parmar,

MPT Student, Department of Physiotherapy, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India.

E-mail: yashasvi22parmar@gmail.com

ABSTRACT

Knee osteoarthritis (OA) is a common condition characterised by chronic pain and reduced mobility, particularly in the elderly population. Transcranial direct current stimulation (tDCS), a non-invasive brain stimulation technique, has proven to be a promising intervention in managing OA. This narrative review aims to synthesize existing evidence on the effectiveness of this intervention in patients with OA, with a primary focus on the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scale as a key outcome.A comprehensive literature search was conducted in PubMed and Scopus databases from 2017 to 2024 to identify studies that investigated various aspects of tDCS, including its effects on clinical and experimental pain, neurophysiological mechanisms, combination therapies, and feasibility in different settings, according to predefined eligibility criteria. The review summarises findings from randomised controlled trials and pilot studies. Evidence indicates that tDCS over the primary motor cortex with the cathode over the contralateral supraorbital area effectively reduces pain severity, enhances pain modulation mechanisms, and improves mobility in knee OA patients. The findings highlight that tDCS improves functional outcomes as measured by WOMAC and benefits in clinical and experimental pain modulation. Preliminary findings are promising, necessitating large-scale trials to optimise protocols, address inconsistencies, and assess long-term effects. This review underscores the clinical relevance of using tDCS in managing OA and identifies gaps for future research, in long-term efficacy and standardised protocols.

Keywords: Chronic pain, Pain measurement, Western Ontario and McMaster Universities Osteoarthritis Index