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GAIT TRAINING AND NEUROMODULATION ON EXECUTIVE AND MOTOR FUNCTION IN PARKINSON'S DISEASE: A RANDOMIZED CONTROLLED PILOT STUDY

Maria Luísa Andrade Gomes[1], Mayane Lais Veloso Férrer[1],
Amanda Carneiro Nascimento[1], David Sam Pessoa[1],
Maria Clara Silva De Melo[1], Adriana Carla Costa Ribeiro Clementino[1]

[1] *Department of Physical Therapy, Postgraduate Program in Physical Therapy, Laboratory of Neurosciences of the Locomotor System (NeuroMOVE), Universidade Federal da Paraíba (UFPB), João Pessoa, Paraiba, Brazil*

Background: Cognitive impartment is recurrent in Parkinson's disease (PD), including deficits in cognitive ability to learn, organize new information, form concepts, and switch focus between tasks (executive functions). These dysfunctions lead to gait alterations, because people with PD tend to prioritize only one activity in dual-task situations. Evidence shows that dual task treadmill training results in improved gait, postural balance, and motor coordination in PD. Transcranial direct current stimulation (tDCS) is a relevant tool in improving cognitive skills by modulating cortical excitability. However, there is a gap in the literature regarding the benefits of the association of these techniques when applied simultaneously in PD.

Objectives: The study aimed to analyze the effects of tDCS simultaneous to dual-task treadmill training on motor function, functional mobility, verbal fluency, and processing speed in people with PD.

Methods: The pilot study of a double-blind, randomized controlled clinical trial including people with PD. People aged 40-70 years, above 24 in the Mini-Mental State Examination, and staging 1.5 to 3 of the modified Hoehn and Yahr scale were included. Eveluated for motor function (Unified Parkinson's Disease Rating Scale Part III - MDS-UPDRS, primary endpoint; Timed Up and Go - TUG test; Timed Up and Go dual task - TUG DT); and cognitive function (Stroop Test; Trail Making Test - TMT; Verbal Fluency Test - VF) before and after the 12 intervention sessions over four weeks. All received 2mA excitatory stimulation in the left dorsolateral prefrontal cortex for 20 minutes and treadmill gait training. The experimental group realized simultaneously a validated protocol for a randomized controlled trial of dual-task training, containing mental sorting, decision-making, and verbal fluency activities. We analyzed the normality of the sample by the Shapiro-Wilk test and the data by the Wilcoxon test, with a significance level of 95%.

Results: Six subjects participated in the study, aged 60 (5.02) years; mixed clinical type (83%); MMSE score of 27.5 (1.71); H&Ymod of 2.08 (0.5); levodopa equivalent dose per day of 765.2 (399.3). They presented in the primary endpoint significant difference in motor function for MDS-UPDRS part III ($Z=-2.060$; $p=0.039$), in TUG functional mobility ($Z=-1.992$; $p=0.046$) and TUG DT ($Z=-1992$; $p=0.046$). As for cognitive function, there was no significant difference for the tests: Stroop ($Z=-943$; $p=0.345$); FV ($Z=-1.761$; $p=0.078$); and TMT ($Z=-0.135$; $p=0.893$).

Conclusion: The results suggest that the association between dual-task training and CBT affected motor function and functional mobility. Processing speed and verbal fluency showed no changes by dual-task training in the study.

Implications: The findings help explore methodologies and introduce new procedures to confirm the effects of the protocol under test.

Keywords: Parkinson's disease, Neuromodulation, Dual-task

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KNOWLEDGE AND SKILLS FOR USING SCIENTIFIC EVIDENCE IN CLINICAL DECISION MAKING

Maria Luiza Caires Comper[1,2,3], Rodrigo Almeida Souza[2],
Jeniffer de Araújo Abreu Minervino[4]

[1] *Techno-Science and Innovation Training Centre, Teixeira de Freitas, Bahia, Brazil*
[2] *Master's Program in Health, Environment and Biodiversity (UFSB), Teixeira de Freitas, Bahia, Brazil*
[3] *Master's Program in Physical Education (UESC), Ilhéus, Bahia, Brazil*
[4] *Medical student at the Health Sciences Training Center at the Federal University of Southern Bahia (UFSB), Paulo Freire campus, Teixeira de Freitas, Bahia, Brazil*

Background: Evidence-Based Medicine (EBM) is an approach that aims to solve health problems through decision-making based on the best scientific evidence, patient values and preferences, and clinical experience. To this end, health professionals must obtain knowledge and skills that allow them to formulate clinical questions, carry out searches in the literature, carefully evaluate the evidence, carry out the transposition of this evidence into the clinical context and verify its effectiveness for solving the initial problem. Despite the relevance of the topic, there are still few studies that assess the level of knowledge and skills of medical students regarding the use of EBM principles for clinical decision-making.

Objectives: To diagnose the level of knowledge and skills of medical students regarding the use of scientific evidence for clinical decision-making, considering the principles of EBM.

Methods: This is an observational, cross-sectional study with a population of medical students. Inclusion criteria were: Brazilian nationality, being over 18 years old, being enrolled from the 3rd year of the course and taking courses listed in the clinical cycle. Sociodemographic questionnaires and questionnaires on the level of prior knowledge in EBM were used, in addition to the Assessing Competencies in Evidence-Based Medicine (ACE) tool. All instruments were transferred and made available through the Google Forms online questionnaire platform. Data were analyzed using descriptive statistics.

Results: The sample consisted of 45 students, mostly men (68.9%), brown (64.4%), single (84.4%) and enrolled in federal universities (91.1%), between the 3rd and 5th year of the course (56.8%). Most claimed to have knowledge (82.2%), regular skills (57.5%) and apply them (82.2%) in clinical practice, however, the average percentage of correct answers in the ACE tool was 43.97 % and about 41.7% left answers blank.

Conclusion: The results of the study demonstrate that, although most medical students claim to have knowledge and skills for the use of scientific evidence in clinical decision-making, there is a disagreement between the way participants perceive their own knowledge and actual knowledge, considering It was found that after applying the measurement instrument, only a reasonable percentage demonstrated adequate mastery of this clinical practice.

Implications: This study reveals important diagnostic points about knowledge and skills of medical students for the use of EBM that can be used to expand the training of health professionals in EBM. Such an approach helps in the formation of physicians with greater capacity for analysis, autonomy and willing to maintain the continuing

education process to remain informed about the most current evidence that appears in the field of medicine.

Keywords: Evidence-Based Medicine, Scientific Evidence, Training in Medicine

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WHAT IS THE MOST COMPLETE OBSERVATIONAL METHOD OF ANALYSIS OF BIOMECHANICAL EXPOSURE IN THE CRITERIA USED?

Daniela Pereira Valentim[1], Maria Padilha Alonso Gomes[1], Lyssa Sandy Medeiros Rodrigues Cirino[1], Patricia Rodrigues da Silva[1], Rosimeire Simprini Padula[1]
[1] *Department of Physical Therapy, Master's and Doctoral Program in Physical Therapy, Universidade Cidade de São Paulo (UNICID), São Paulo, São Paulo, Brazil*

Background: There is a wide variety of observational methods for analyzing the biomechanical exposure of workers in the work environment. Valentim et al. (2023) performed a systematic review of these methods and identified 10 explicit observational methods of analyzing biomechanical exposure with high quality of evidence and good measurement properties. The lack of studies that analyze the criteria, the specificity and the way in which these methods evaluate the exposure factors, and their dimensions (frequency, intensity, and magnitude) stimulated this study.

Objectives: To present the characteristics and criteria of the 10 most observational methods with adequate reproducibility and validity measurement properties, and with acceptable quality of evidence.

Methods: This is an analytical and descriptive study of the 10 observational methods for analyzing the biomechanical exposure of workers identified in the systematic review by Valentim et al. (2023), being the most researched and with adequate properties for measuring reproducibility, validity, and acceptable quality. of evidence. Three professionals with knowledge and experience in using the methods carried out a weighted assessment, seeking to identify the main characteristics of each method (occupational task evaluated and main posture of analysis), in addition to data on risk factors, their dimensions and body segments of each method. Finally, the influence of each criterion on the risk exposure classification was evaluated, based on the partial and final scores.

Results: Among the evaluated methods, seven of them present characteristics and criteria that allow a general evaluation of the worker in any main posture. The most evaluated risk factors were joint position and range of motion. The EAWS method is the method that most evaluates biomechanical exposure factors (nine out of the ten listed). The ACGIH HAL TLV and RULA do not assess all biomechanical exposure factors. ROSA is the method that evaluates a greater number of body segments. The trunk and isolated segments, such as the shoulder and wrist, are present in the evaluation of seven of the ten methods. The EAWS, PATH, REBA, ROSA, and RULA methods assess the lower limbs in general. Most of the criteria (exposure factors and body segments) evaluated by the 10 observational methods have a great influence on the classification of risk exposure.

Conclusion: The EWAS, OWAS, PATH, QEC, REBA, RULA and SI methods evaluate any task in general. The ACGIH HAL TLV and ROSA

methods are directed to specific tasks. The assessment of biomechanical factors and body parts vary between each method and the most complete and detailed observational method among all analyzed in this study is the European Assembly Worksheet (EAWS).

Implications: Getting to know the methods better is essential and will help both in choosing the most appropriate method for the analysis and in choosing more assertive preventive measures in the work environment. Contributing to the decision-making of professionals and favoring the reduction of work-related musculoskeletal disorders.

Keywords: Occupational Risk, Physiotherapy, Occupational Health

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ELECTROMYOGRAPHIC ACTIVITY OF THE GLUTEUS MAXIMUS DURING PILATES METHOD EXERCISES COMPARED TO THE SQUAT EXERCISE

Maria Vitória Gonçalves da Silva[1], Gabriela Malavasi Minetto[1], Isabela Cristina Soares[1], Deborah Hebling Spinoso[1]
[1] *São Paulo State University (UNESP), Institute of Biosciences, Campus Rio Claro, Rio Claro, São Paulo, Brazil*

Background: Among the muscles worked in the Pilates method exercises, emphasis is placed on activating the Gluteus Maximus (GM), due to its role in pelvic stabilization during functional activities. An ineffective activation of the GM can contribute to lumbopelvic instability and generate overload on the lumbar spine and other joints of the lower limb. In this way, exercises with an emphasis on GM activation are essential for clinical practice in the prevention and rehabilitation of different musculoskeletal disorders, becoming part of the Pilates method and of conventional exercises.

Objectives: To compare the level of muscle activation of the gluteus maximus during Pilates method exercises in relation to conventional exercise.

Methods: This is a cross-sectional study. All participants signed an informed consent form. The following were eligible for the study: women between 18 and 30 years old; without the presence of degenerative diseases in the hip joints and history of injury or trauma in the lower limbs and lumbar spine. Pain in the pelvis and lumbar spine were considered as a criterion for non-eligibility. Personal and anthropometric data from the participants were collected, followed by an exercise protocol associated with the assessment of electromyographic signals from the GM. The Pilates method exercise protocol included: superman, bird dog and pelvic elevation. The squat exercise was performed as part of the conventional protocol. A familiarization of each exercise was performed, followed by three valid executions with an interval of 40 seconds between each repetition and five minutes between each set of exercises. There was a verbal stimulus in relation to the contraction of the GM muscle during the execution. Electromyographic data were performed during the four exercises using Surface Electromyography (EMG). The electrodes were positioned following the SENIAM rules. For the analysis of the electromyographic data, specific routines were used in a Matlab environment, with the mean value of the linear envelope of the three attempts of each exercise and