Methods: This was a cross-sectional observational study with a non-probabilistic convenience sample. Subjects included were those diagnosed with CM by a neurologist, on stable CM medication for at least three months, and without other associated headaches. Pain levels were assessed using the VAS, NPS, and the Migraine Disability Assessment Scale (MIDAS). Upon inclusion, participants were asked, "What is the intensity of your headache during a migraine attack?", which was quantified using the NPS. Next, the second part of the assessment was conducted, where the MIDAS and VAS were applied. Data were analyzed descriptively and inferentially using SPSS software, version 20. The Kolmogorov-Smirnov test was used to assess data normality; the Wilcoxon test was applied to compare NPS and VAS scores; and Spearman's correlation was used to evaluate the relationship between the variables and the MIDAS scale. A 95% confidence interval and a p-value < 0.05 were considered statistically significant.
Results: The sample comprised 80 women, with a mean age of 35.99 ± 2.17 years. The median NPS pain score was 10 (2.00), while the median VAS score was 8.35 (2.78). The MIDAS median score was 81.5 (88.75), indicating a significant functional impact of migraine. A statistically significant difference ($p < 0.05$) was observed in the comparison between the scales, with a positive correlation ($rS = 0.27$; $p < 0.05$). The NPS showed a stronger correlation with the MIDAS scale ($rS = 0.33$; $p < 0.01$) compared to the VAS ($rS = 0.27$; $p < 0.05$), though both correlations were significant.
Conclusion: The NPS demonstrated a stronger correlation with pain-related functional impairment, suggesting it may be a more sensitive tool for this purpose.
Implications: The stronger correlation between the NPS and MIDAS suggests that the NPS may be more effective in monitoring the impact of pain on patients' functionality, aiding in therapeutic decision-making. Further studies are needed to confirm these findings and expand the understanding of the clinical applicability of pain assessment scales.
Keywords: Pain scales, Chronic migraine, Functional disability

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PASSIVE MOBILIZATION PERFORMED BY AN AUTOMATED KINESIOTHERAPY DEVICE: IMMEDIATE EFFECTS OF ON GAIT BIOMECHANICS IN HEMIPARETIC PATIENTS

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Background: Brain injuries refer to damage in cerebral structures, either vascular or traumatic in origin, leading to impairments in postural, balance, and muscle tone. These manifestations result in significant movement limitations, thus affecting daily activities and increasing the risk of falls, pain, and discomfort. Passive mobilization is a therapeutic approach that can influence joint range of motion and the properties of muscle and connective tissues. Automated devices enable passive movement repetition with greater intensity, reproducibility, and specificity while also reducing the physical strain on physical therapists. However, studies assessing the effects of this intervention on the lower limbs of spastic and hemiparetic patients remain scarce.
Objectives: This study evaluated the immediate effects of passive mobilization performed with a kinesiotherapy device on spatiotemporal gait parameters in hemiparetic patients.
Methods: This clinical trial included 18 hemiparetic patients diagnosed with brain injury. We performed gait assessment using an Inertial Measurement Unit (IMU) with an accelerometer and gyroscope and evaluated discomfort using the Visual Analog Scale (VAS). The intervention protocol involved passive kinesiotherapy using an automated device for 30 minutes, with all tests applied pre- and post-intervention.
Results: The intervention improved cadence, symmetry, step length, and propulsion for both the affected and unaffected hemibody, with a significant increase in walking speed ($p = 0.02$). Step length of both the affected and unaffected limbs, as well as propulsion of the affected limb, showed a moderate effect size.
Conclusion: The results of this study demonstrate that passive mobilization using an automated kinesiotherapy device has immediate effects on gait biomechanics in hemiparetic patients. It is well established that muscle joint complex function depends on the integrity of the mechanical components of the tissue, and the passive kinesiotherapy device protocol suggests that passive mobilization positively impacts components related to muscle-joint integrity.
Implications: These findings represent a new perspective on applying automated passive mobilization to complement conventional physiotherapy in neurological rehabilitation. An important point to highlight is that the device is intended for home use and does not replace physiotherapy but should be considered a complementary treatment. This approach can maximize gains and minimize losses, optimizing rehabilitation goals based on the ICF framework, as patients can continue guided rehabilitation at home.
Keywords: brain injury, muscle spasticity, gait, hemiparesis, continuous passive motion therapy

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ASSOCIATION BETWEEN ABDOMINAL PERFORMANCE AND BICEPS BRACHII ACTIVATION RANGE DURING FOUR IRRADIATION MANEUVERS: A CROSS-SECTIONAL STUDY

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Background: Proprioceptive Neuromuscular Facilitation (PNF) is a therapeutic approach with principles and procedures used to promote motor rehabilitation. One of the principles of PNF is motor irradiation, in which the application of resistance to a stronger body segment promotes muscle contraction in another weaker limb. This is useful in motor recovery when voluntary contraction is not possible, such as in cases of paralysis of a segment. Abdominal strength is fundamental to the effectiveness of various training and rehabilitation techniques. But, in clinical practice, it is commonly observed that people with greater abdominal strength produce weaker contractions in target muscle during the application of irradiation maneuvers.
Objectives: To investigate the relationship between abdominal strength and the amplitude of activation of the biceps brachii

muscle provoked by the execution of four FNP motor irradiation maneuvers.
Methods: A cross-sectional observational study was conducted with 33 healthy participants (19 women and 14 men, with 27 ± 5 years of age, 1.70 ± 0.09 m in height, 68.6 ± 14.47 kg in body mass, and BMI of 23.64 ± 3.90 kg/m^2). Inclusion criteria were age between 18 and 45 years and agreement to sign the Free and Informed Consent Form. Individuals with uncontrolled cardiovascular conditions, musculoskeletal alterations, post-COVID sequelae, and other contraindications to the use of EMG were excluded. After signing the consent form, a screening session was held to identify the demographic characteristics of the sample and identify the non-dominant side. Next, the maximum voluntary contraction of each participant was measured. Then, surface electromyography (EMG) (Delsys trigno) of the biceps brachii on the non-dominant side was obtained, while the patterns of (i) flexion, adduction and external rotation with knee flexion in lateral decubitus; (ii) extension, adduction and internal rotation of the upper limb in dorsal decubitus; (iii) rotation of the lower trunk in prone; and (iv) pre-bridge position on the elbows (upper limb along the body without supporting it on the stretcher) in an adapted position (standing with the knees semi-flexed) were applied on the dominant side against manual resistance. Each pattern was repeated 3x and the contraction maintained for 5s on each attempt, with a 10s rest interval. Abdominal strength tests were performed according to the American College of Sports Medicine protocol.
Results: The amplitude of the EMG of the biceps brachii was significantly different between the irradiation maneuvers applied, but there was no group effect (divided according to performance in the abdominal test), nor any significant interaction between group and maneuver.
Conclusion: The data indicate that the level of performance in the abdominal test may not significantly influence the specific recruitment of the biceps brachii during the application of irradiation maneuvers. Future studies should consider a larger sample size, with different age groups and body composition, and with different kind of diseases.
Implications: This study challenges the assumption that stronger abdominal muscles decrease recruitment of distal muscles through irradiation techniques. If future studies confirm these findings, abdominal strength will not need to be considered when healing weakness of a segment with motor irradiation.
Keywords: Rehabilitation, Muscle Contraction, Electromyography

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BICEPS BRACHII ACTIVATION DURING MOTOR IRRADIATION: A CROSS-SECTIONAL STUDY IN HEALTHY INDIVIDUALS

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Background: Motor irradiation is a basic procedure of proprioceptive neuromuscular facilitation (PNF) in which a manual resistance is applied to one body part to generate muscle activation in another segment, aiming at improving strength. Few studies have investigated whether the targeted muscle exhibits a relevant electromyographic (EMG) pattern of muscle activation during the application of motor irradiation. Moreover, no study analyzed motor irradiation targeted to the biceps brachii muscle, an essential muscle in various daily activities evolving upper limbs.
Objectives: To analyze the muscle activation patterns of the biceps brachii in healthy individuals during different PNF irradiation maneuvers.
Methods: This was a cross-sectional study in which 33 healthy individuals were assessed, 19 women, 26 years old (min 20, max 43), 67kg (min 42, max 97), 1.70m (min 1.51, max 1.88). After signing the consent form, a screening session was carried out immediately before the intervention, consisting of identifying the sample, the non-preferred side and maximum voluntary contraction measurements. EMG (Delsys trigno) of the biceps brachii were performed during 4 randomized FNP irradiation techniques (flexion, adduction, and external rotation of the lower limb [FAR]; extension, adduction and internal rotation of the upper limb [EAR]; inferior rotation of the trunk [ROT] and prone on the adapted elbow [PRO]). The techniques were applied 3 times for 5 seconds with a 10-second interval.
Results: There was electromyographic activation of the biceps brachii for the 4 FNP motor irradiation maneuvers. In the post hoc analysis, the upper limb extensor pattern showed less activation when compared to the other three patterns ($P < 0.006$). EMG amplitude was consistently higher in maneuvers than EAR when compared with other maneuvers. Group analysis revealed significant differences in EMG amplitude (in % of MVC) among motor irradiation maneuvers ($P < 0.001$). Posttest analysis reveals significant differences between EAR maneuver and FAR ($P < 0.001$), PRO ($P = 0.006$) and ROT ($P < 0.001$), with no differences among FAR, PRO and ROT (P always > 0.875). EMG amplitude in EAR was smaller than in other PNF maneuvers. There were also significant differences in active EMG duration (in % of total duration) among PNF maneuvers ($P < 0.001$). Posttest analysis reveals significant differences between EAR and FAR ($P = 0.006$), PRO ($P = 0.002$) and ROT ($P < 0.001$), with no differences among FAR, PRO and ROT (P always > 0.506). EAR exhibited the shorter active EMG duration compared with other PNF maneuvers.
Conclusion: There was activation of the biceps brachii for all four FNP irradiation techniques, with the upper limb extensor pattern showing the least activation. Future studies should explore clinical applications, long-term effects, and functional benefits of different muscles and PNF irradiation maneuvers.
Implication: These findings can help guide rehabilitation strategies, emphasizing the importance of selecting appropriate PNF techniques for targeted muscle activation. Clinicians can use this information to optimize treatment for patients with upper limb weakness or neuromuscular impairments.
Keywords: manual therapy, proprioceptive neuromuscular facilitation, electromyography

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