

Protocol in Paralympic Sports (PLEEP) questionnaire was used to collect information on injury diagnoses, which were obtained from the medical department during the championship. A quantitative analysis of the data was performed using descriptive statistics.

Results: Fifty wheelchair fencing athletes participated in this study, 56% male and 44% female, with a mean age of 30.92 (± 11.14) years. Regarding the functional categories of the athletes, 62% were in category A and 36% in category B. During the championship, 16 injuries were recorded, 62.5% of which were in the upper limbs. The diagnoses of injuries included effort-induced muscle disorder (43.75%), contusion (25%), blister (18.75%), and abrasion (12.5%). Regarding the risk factors related to the diagnoses, it was observed that 25% of the effort-induced disorders were associated with repetitive movements with the armed arm, and 18.75% with movements specific to the modality. For bruises, 12.5% were related to blows with the tip or blade of the combat weapon and 12.5% to the transfer of the wheelchair. Regarding blisters, 12.5% were associated with the use of protective equipment (gloves) and 6.25% to the use of the combat wheelchair (holding the support bar during combat). Abrasions were related to blows with the tip or blade of the combat weapon (12.5%).

Conclusion: The results of this study indicate that the upper limbs are the most affected region by injuries among wheelchair fencing para-athletes, with exercise-induced disorder being the most frequent diagnosis. Risk factors such as repetitive and modality-specific movements were frequently associated with these injuries.

Implications: The identification of the types of injuries and their risk factors contributes to the identification of modality-specific prevention demands, providing greater safety in the practice of sports by para-athletes.

Keywords: Athlete Injuries, Epidemiology, Wheelchair Fencing

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ASSOCIATION BETWEEN SLEEP QUALITY AND THE UPPER LIMB ROTATION TEST PERFORMANCE IN SWIMMERS

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Background: Sleep plays an important role in physiological and psychological well-being. Poor sleep quality can impair competitive performance through, increase injury rates and reduced training efficiency. On the other hand, high-quality sleep before a competition can enhance performance and optimize results. Despite these findings, the literature has yet to explore whether sleep quality is related to performance in tests such as the Upper Limb Rotation Test (ULRT).

Objectives: To analyze the association between sleep quality and physical performance in the ULRT among swimmers.

Methods: This was a cross-sectional study. This study was approved by Ethics Research Committee. The sample included swimmers of both sexes, aged between 12 and 60 years, with more than one year

of experience in the sport, training at least three times per week, and actively participating in competitions. Sleep quality was assessed using the Brazilian version of the Pittsburgh Sleep Quality Index (PSQI), a valid and reliable 10-item instrument. Upper limb physical performance was evaluated using the ULRT. The test was performed with athletes in an elbow plank position, with the shoulder, epicondyle, greater trochanter, and lateral malleolus touching a wall. They executed trunk rotations combined with external shoulder rotation at 90° of abduction, aiming to touch a mat on the wall as quickly as possible within 15 seconds. Three attempts were performed, with a 45-second rest between trials, the number of repetitions was recorded as the score, and the mean of three trials was considered for analysis. Data analysis was conducted using Jamovi software. Univariate linear regression was performed to assess the association between sleep quality and the Upper Limb Rotation Test (ULRT).

Results: A total of 53 swimmers were included, with an average of 7.0 $\pm$ 6.36 years of sports practice and a mean age of 30.2 $\pm$ 14.4 years, of whom 23 (45.1%) were female. Performance in the ULRT showed no significant association with sleep quality ($p > 0.05$). Additionally, sleep quality explained less than 21% of the performance variation for both the dominant and non-dominant limbs.

Conclusion: The findings suggested that sleep quality, assessed with the PSQI, was not associated with ULRT performance in swimmers. Future studies should consider different approaches to analyzing sleep quality, as well as incorporating physiological and psychological factors, to better understand the relationship between sleep and functional performance.

Implications: The sleep quality, assessed with PSQI, did not have a significant impact on ULRT performance.

Keywords: Physical performance tests, functional tests, sleep disorders

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INFLUENCE OF CATEGORY AND BIOLOGICAL SEX ON THE LEVEL OF PAIN CATASTROPHIZING IN SWIMMING ATHLETES

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Background: Pain catastrophizing, an exaggerated tendency to anticipate and amplify painful sensations, is a critical factor in the evaluation and treatment of athletes. The Pain Catastrophizing Scale (PCS) is a self-assessment questionnaire, consisting of 13 statements that assess thoughts and feelings related to pain. In the context of swimming, a high-performance sport, understanding the differences in pain catastrophizing between age and sex categories can provide information about each individual's perception of pain. This study aims to explore how these factors influence the level of sleep catastrophizing in athletes.

Objectives: To characterize the level of catastrophizing in swimming athletes and analyze the association of category and sex with the level of pain catastrophizing in swimming athletes.

Methods: This is an observational cross-sectional study. Forty-four swimmers of both sexes classified in the children's, youth and junior categories participated in the study. The athletes responded to the Pain Catastrophizing Scale, which ranges from 0 to 52 points, with values above 30 points representing a significant level of pain catastrophizing. The Total Pain Catastrophizing score was calculated. Analysis of Variance and independent t-test were used for analysis.

Results: Of the 44 athletes evaluated, 33 completed the Pain Catastrophizing Scale, 13 of whom were in the Children's category, 10 in the Youth category and 10 in the Junior category. Of these, 21 were men and 12 were women. Only 6 athletes had a score higher than the cutoff point. There was no significant difference between the categories ($p = 0.946$) and, when comparing genders, there was no significant difference in pain catastrophizing ($p = 0.145$).

Conclusion: The study revealed that most of the athletes evaluated presented low levels of pain catastrophizing, with only 6 athletes demonstrating scores above 30 points, indicating a significant level of catastrophizing. Furthermore, there was no significant difference between categories and genders. Future studies with larger sample sizes and with athletes at different levels of competition need to be carried out to better investigate the factors that influence catastrophizing.

Implications: Pain catastrophizing is an exaggerated negative orientation towards harmful stimuli and should be considered important for the performance and well-being of athletes, especially those with a history of previous injuries. The presence of catastrophic thoughts can impair adaptation to physical discomfort and negatively influence sports performance. Therefore, it is essential that sports training and rehabilitation programs include psychological approaches that help to reduce pain catastrophizing, covering different factors that may be associated with the amplification of pain sensation. Continued studies on the impact of pain catastrophizing may contribute to the development of more specific and effective interventions for different age groups and sports modalities.

Keywords: athletes, catastrophization, pain perception

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KINEMATIC AND KINETIC ADJUSTMENTS AT THE TRUNK DURING SUBMAXIMAL AND MAXIMAL INSTEP SOCCER KICKS

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Background: During soccer matches, players frequently adjust kicking effort to modulate ball velocity and meet specific tactical demands. Submaximal kicks are typically used for short passes, while maximal kicks are employed for long passes or goal attempts. In maximal kicks, the trunk plays a crucial role in generating a downward energy flow toward the pelvis and the kicking limb, which may avoid excessive effort and overload at the lower limb. However, how these contributions vary across different kicking effort levels remains unclear.

Objectives: This study investigated the kinematic and kinetic adjustments at the trunk, hip, and knee joints of the kicking limb during instep kicks performed at three effort levels.

Methods: Forty-four amateur soccer players (age: 23.9 ± 4.8 years) performed kicks at maximal effort, 70-80% of maximal, and 50-60% of maximal. Three-dimensional motion capture was performed at 300 Hz, and ground reaction forces were recorded at 1200 Hz. Kinematic and kinetic data were processed using Visual 3D software. Statistical parametric mapping with repeated measures ANOVA was used to compare time series between effort levels.

Results: The trunk exhibited distinct adjustments in the sagittal plane depending on the kicking effort. During maximal kicks, in the backswing and leg cocking phases, trunk flexion moments generated a downward energy flow toward the pelvis, accelerating its retroversion and contributing to the forward motion of the kicking limb toward the ball. Subsequently, part of this energy was redistributed to the thigh and shank during the acceleration phase, favoring increased final velocity. In contrast, during submaximal kicks, trunk extensor moments were predominant and generated an upward energy flow from the pelvis to the trunk, decelerating pelvic retroversion. In the transverse plane, in both maximal and submaximal kicks, trunk rotation moments generated a downward energy flow toward the pelvis, inducing pelvic rotation toward the support limb and assisting the forward displacement of the kicking limb. Additionally, hip and knee moments in the kicking limb increased with effort, optimizing energy transfer to the shank.

Conclusion: Trunk-generated moments and energy flows act as additional resources for advancing the kicking limb, with axial trunk moments being recruited at all effort levels and sagittal trunk moments being used exclusively during maximal kicks. These findings highlight the importance of trunk muscles in coordinating kicking performance.

Implications: Training programs should include exercises to strengthen trunk flexor and rotator muscles, especially for maximal kicks. Incorporating strength and power training for the trunk and lower limbs at different intensities may improve intermuscular coordination and kicking efficiency. Educating players about proximal-to-distal control of movement may enhance performance across different kicking efforts and avoid joint and muscle overloads.

Keywords: Soccer kicking, Biomechanics, Kinetic chain, Energy flow

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INFLUENCE OF BIOPSYCHOSOCIAL FACTORS ON UPPER LIMB PERFORMANCE IN UNIVERSITY HANDBALL ATHLETES

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Background: Handball is an Olympic team sport played on a court, involving running, shooting, jumping, repeated accelerations, and directional changes. However, research on handball athletes is limited, especially among university-level players. High-performance throwing requires a combination of biomechanical factors, such as upper limb power and precise coordination of joint movements. Although these factors are crucial for performance, psychological and social variables may also influence sports outcomes. University