P6.4 – ID 48 (NIA)

INFLUENCE OF A SUSPENDED AID ON WRIST LOADING PATTERN DURING CIRCLES ON POMMEL HORSE

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The aim of this study was to investigate the influence of a suspended aid on the reaction forces during a basic skill on pommel horse. Twenty gymnasts performed three sets of 10 circles with and without a suspended aid on a pommel horse under which two force plates were set. The results confirmed that the suspended aid could reduce the magnitude of the pommel reaction forces during circles while maintaining the general loading pattern. The average force, peak force, and impact force were all reduced by the use of the aid. A suspended aid may be useful for all levels of gymnasts who would like to practice pommel horse exercises with reduced wrist loading for a purpose such as a progression for learning a new skill, control of training volume or rehabilitation.

KEY WORDS: gymnastics, body weight support, force, wrist injuries, training aid.

P8.10 – ID 546

LOAD DURING THE VERTICAL JUMP IN WATER: VALUES FOR PRESCRIPTION IN HYDROTHERAPY

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This study aimed to analyse the vertical component of the ground reaction force (GRF) in the vertical jump in water performed by men and women at two levels of immersion. 11 men and 11 women performed three vertical jumps on a water-proof force plate at hip and chest levels of immersion. No effect of gender was observed. No difference between levels of immersion was found for peak of propulsion [1.85 and 1.89 units of body weight (BW) at the hip and chest respectively]. During the landing phase, the force peak was significantly higher at the hip level (2.62 BW) than at the chest level (2.07 BW). The force during the propulsion phase was similar between the immersions; however the vertical load on landing needs to be considered when prescribing this exercise, even in water.

KEY WORDS: biomechanics, aquatic exercises, hydrogymnastics, rehabilitation.

P6.7 – ID 349

KINEMATICS AND ANGULAR MOMENTUM CONTRIBUTIONS TO THE TOE-ON TKACHEV ON UNEVEN BARS IN FEMALE GYMNASTICS

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The purpose of this study was to explain the mechanics of the Toe-on Tkachev on Uneven Bars, and identify whether this variant creates the release characteristics needed to perform more complex aerial body positions (e.g. straight). Images of 5 Toe-on Tkachev's performed at the 2007 World Championships were recorded with twin video cameras (50Hz). Digitising and 3D DLT techniques were combined with inertia modelling to develop customised profiles for the gymnasts. Greater flight time and angular momentum (L) suggest this variant may provide the gymnast with the opportunity to perform more complex aerial shapes. The dominant roll of the hip in the creation of L was highlighted.

KEY WORDS: gymnastics, Tkachev, segmental angular momentum.

P8.4 – ID 438

13th FINA WORLD CHAMPIONSHIP FINALS: STROKE KINEMATICS AND RACE TIMES ACCORDING TO PERFORMANCE, GENDER AND EVENT

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The aim of this work was to compare the stroke kinematics and race times of the freestyle final races at the 13th FINA World Championships between: (i) the three medalists versus the last three finalists; (ii) males versus female swimmers; (iii) all events in each gender. Data was collected from the championships official web site. There were no significant differences in the stroke kinematics neither in the race times between medallists and non-medallists. There were significant effects in the stroke kinematics and race times according to race event. There were significant effects in the stroke kinematics and race times according to swimmers gender. It seems there are different tactics and biomechanical strategies according to gender and swimming event.

KEY WORDS: swimming event, event time, stroke length, stroke frequency, swim velocity.

P12.7 – ID 464

KINEMATICS OF FOOT-SHANK COMPLEX IN "*KENDO*" AND ITS RELATIONSHIP WITH FOOT ARCH HEIGHT

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The purpose of this study was to demonstrate 1) the joint couple of foot-shank complex in the kendo motion and 2) the relationship between the kinematic values and the foot arch height. Seventeen experienced kendo athletes volunteered to participate in the study. We instructed the participants to perform three sets of kendo strike-