

## 101 BIOMECHANICAL RISKS OF KNEE INJURY IN MIXED MARTIAL ARTS: A VIDEO-BASED NOTATION ANALYSIS

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**Background** Incidence rate of knee injury in mixed martial arts (MMA) is high. MMA is a high-intensity sport that requires constant angle and level change. A majority of the combined movements overlap with biomechanics that have been suggested to be associated with increased risk of knee injury.

**Objective** To identify the frequency of occurrence of the high-risk movements, i.e. dynamic valgus, during MMA competitions.

**Design** Video-based notation analysis.

**Setting** The analysed movements have been separated into two categories, Gross Biomechanical Risks and Detailed Biomechanical Risks. High-intensity movements were analysed in slow motion to ensure accuracy. Three fights were re-watched after all 29 fights as quality control to assess the reliability of measurement.

**Patients (or Participants)** 29 MMA fights.

**Interventions (or Assessment of Risk Factors)** Documenting all visible high-risk knee injury movements occurred in the fights.

**Main Outcome Measurements** The frequency of occurrence of the high-risk movements, i.e. dynamic valgus, during MMA competitions. In addition, other gross biomechanics were recorded.

**Results** On average, an MMA athlete experienced 31 times of knee valgus motion with explosive force drag during a match. The side affected was highly subjective to the stance of the fighter. The rear leg was most likely to go through knee valgus motion.

**Conclusions** The result showed high-risk knee motions are common in MMA. Based on the data, knee valgus on the rear leg is of interest for future injury prevention focus. The data collected in this study can be used as the backbone for further investigation on the possible ways for knee injury prevention.

## 102 TOP-LEVEL KARATE ATHLETES: ARE THEY IMPLEMENTING PREVENTATIVE INJURY MEASURES?

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**Background** The current status of injury prevention implementation in top-level karate is unknown.

**Objective** To examine the current perceptions and practices of top-level karate athletes concerning risk-factors and injury prevention implementation.

**Design** Cross-sectional study based on face-to-face surveys.

**Setting** During the official medical meeting of the karate World Senior Championships (WSC) Madrid, 2018, the Chairman of the World Karate Federation Medical Commission presented the project and invited the 131 team doctors to inform

their athletes about the survey. Only athletes that accepted the invitation and speaking English, French, Slovak, Polish, Czech and/or Spanish were involved in this study.

**Patients (or Participants)** Out of a total of 1117 athletes (140 countries/teams) that participated in the WSC, 137 (50 countries/teams) have completed the questionnaires (399 athletes didn't speak any of the mentioned languages, 201 athletes didn't volunteer and 380 couldn't be reached)

**Interventions (or Assessment of Risk Factors)** The survey was constructed face to face and consisted of 15 questions.

**Main Outcome Measurements** The current perceptions and practices of top-level karate athletes concerning risk factors and injury prevention implementation.

**Results** Only 44.7% of the participant athletes have reported that their teams have conducted any preventive measures to reduce injury risk. Kumite athletes (51.2%) were more likely to practice injury prevention compared to kata athletes (25%;  $P=0.016$ ). Athletes who received preliminary advices about injury prevention (58%) were more likely to practice it, compared to who did not receive any advice (20.5%;  $P<0.001$ ). Athletes who have a fitness coach (part time or full time) were practicing more injury prevention strategies (66.7% and 51.4%, respectively) compared to athletes who do not have a fitness coach (35%;  $P=0.031$ ).

**Conclusions** Injury prevention advices and the presence of a fitness coach are associated with an increase in the injury prevention practice. Action plans regarding injury prevention education should be implemented.

## 103 THE EPIDEMIOLOGY OF TRAUMATIC BRAIN INJURIES WITHIN USA FENCING, 2015–2020: PREVENTION, CARE, AND RETURN TO PLAY CONSIDERATIONS

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**Background** Mild traumatic brain injury (mTBI) is an increasing sports-related and public health concern affecting millions annually. While competitive fencing has been identified as a safe sport with a low occurrence of sport related injury, prevention, care, and return to play considerations from a mTBI is a persisting issue due to sport related factors.

**Objective** To identify incidence and prevalence of mTBI over 5 competitive fencing seasons through a Sport Event Medical Encounter System (SEMES).

**Design** Documented mTBI sustained at USA Fencing sponsored domestic events and individual and national team involvement at international events were analyzed from the 2015–2020 competitive seasons.

**Setting** All SEMES mTBI data collected at USA Fencing sponsored domestic fencing events involving Y14 through veteran competitors as well as individual and national team involvement at international events were included in the analysis.

**Patients (or Participants)** Inclusion criteria involved both genders within the competition categories of Y14 through veteran divisions. Among 98,000 fencing competitors, 75 sustained a mTBI requiring medical withdrawal.

**Interventions (or Assessment of Risk Factors)** USA Fencing has an annual competitive growth of 5% over the past five