

**Background** Studies of Swedish track and field athletes have shown that there is a substantial risk of injury. None of these studies have investigated the potential role of how athletes perceive their injury risk, and how it may play a part in the occurrence of sport injuries.

**Objective** Explore how Swedish track and field athletes perceive their injury risk, and examine the potential correlation with prior injury experience.

**Design** A quantitative design, an exploratory study.

**Setting** Swedish junior elite track and field athletes.

**Patients (or Participants)** The convenience sample comprised 69 out of 97 Swedish junior elite track & field athletes. The entry criteria included injury free when answering the questionnaire, active in track & field, participated in at least one youth or junior national team between 2013 and 2017.

**Interventions (or Assessment of Risk Factors)** The participants had four weeks to fill out a two-part online questionnaire. The first part requested relevant personal information including previous injuries in the past 12 months; the second part consisted of 'The Perception of Risk of Injury Scale' (RISSc), but modified accordingly to the targeted sport.

**Main Outcome Measurements** RISSc scores were set as the dependent variable.

**Results** Non-significant results ( $p=0,095$ ) were found between gender and perceived injury risk. If an athlete reported more than one injury in the past 12 months, they perceived their re-injury risk ( $p<0,025$ ) to be higher. Significant results were found between perceived injury risk and the severity of the injury ( $p<0,006$ ,  $r=-0,32$ ).

**Conclusions** Previous injury has a small correlation to perceived injury risk. It may be possible to reduce negative perceptions concerning re-injury in athletes with higher perceptions of injury risk. Awareness of re-injury should be increased among athletes with a history of severe injury. This study may serve as a springboard for additional research.

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#### RUNNING STYLE-DEPENDENT RISK FACTORS FOR PATELLOFEMORAL PAIN

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**Background** Patellofemoral-pain is a widespread problem among recreational-runners. Often it comes to training absenteeism because of pain at the proximal edge of the patella.

**Objective** To examine if there is a connection between the occurrence of patellofemoral pain and the running style.

**Design** Retrospective case-control-study.

**Setting** The running analyses all took place in the same 2 D running lab. The selected analyses are of recreational and amateur runners, running at least 10km/week, who were complaining of patellofemoral pain.

**Patients (or Participants)** There was a pool of 1013 running-analyses in which the subjects complained of patellofemoral complaints (234 analyses), then all dates of recreational and competitive athletes (234 analyses) were first filtered out. This resulted in an analysis number of 113 analyses, which were included. All participants were examined by a sport medicine specialist and the diagnosis of patellofemoral pain syndrome were determined by X-ray and MRI imaging.

**Interventions (or Assessment of Risk Factors)** Primary contact with the ground, malposition of the legs, Achilles tendon angle, pelvic stability, knee inflection and lower leg swing were observed via a 2D running-analyse.

**Main Outcome Measurements** The 113 analyses were examined in terms of running technique and dynamic biomechanical misalignments. The evaluation was based on the 4-point model of Marquardt.

**Results** It was noteworthy that in 98.2% ( $n = 111$ ) of the examined subjects, the primary contact with the ground was via the heel. In 90.9% ( $n = 101$ ) of these subjects, there was also increased knee flexion in the medium support phase. This was also observed in the other two subjects without heel strike (91.1% ( $n = 103$ ) increased knee flexion).

**Conclusions** The primary contact of the heel and also an increased knee flexion in the medium support phase can increase the risk of patellofemoral-pain occurrence.

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#### A RISK FACTOR ANALYSIS FOR HEAD, NECK, AND FACE INJURIES BETWEEN US MEN AND WOMEN RUGBY-7S PLAYERS BY AGE-GROUPS

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**Background** Previous studies have highlighted the prevalence of head, neck, and face (HNF) injuries among male and female rugby-15s players; however, differences in risk-factors between sexes and age have not yet been examined in Rugby-7s.

**Objective** To identify risk factors of HNF injuries and sex risk differences among Rugby-7 players by age-groups.

**Design** Logistic regression analysis.

**Setting** USA Rugby tournaments/series and championships (U-19 to Elite; 2010–2016).

**Participants** 1,307 (68%=men, 31%=women) head neck and face injured U.S. Rugby-7s tournament players.

**Assessment of Risk Factors** A cross-sectional analysis was conducted using the RISE Rugby Injury Registry. Anthropometric data, injury mechanism, and other factors were tabulated by HNF injuries and sex. Logistic regression determined the relationship between sex and HNF injuries. A final multivariable model was used to calculate the probability of HNF injuries and differences between sex and age-groups.

**Results** From 2010–2016, 1,679 match injuries were seen (68%=men, 32%=women) injuries. A total of 474 (28%) HNF injuries were documented. The most commonly

injured body part was the head (48%) with concussions (40%). Final model revealed sex, age, position during contact, contact surface, and play legality were significantly associated with HNF injuries. Controlling for play legality and position during contact, U18-men injured during contact with an opposing player had the highest probability of HNF injuries (51%) and a higher probability than U18 women ( $P=0.004$ ). Meanwhile, women 18–24 ( $P=0.019$ ) and over 30 ( $P=0.042$ ) who were injured during contact with the ground had a higher probability of HNF injuries than men.

**Conclusions** Under-18 male players involved in contact with players were most at risk for HNF injuries. Meanwhile, adult women 18–24 and 30-years old had a higher probability of sustaining a HNF injury when injured during contact with the ground. Tackle techniques, break falls, and other interactions employed by developing women and men players, including tackles or collisions, should be reviewed in detail for injury reduction.

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### THE NORDIC HAMSTRING EXERCISE: AWARENESS, IMPLEMENTATION AND OPINION OF WORLDWIDE ATHLETES

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**Background** The Nordic hamstring exercise is an effective program in reducing the hamstring injuries, which is one of the most common non-contact lower limb injuries, especially in sports requiring acceleration, maximal sprints, and sudden change in direction of running, as sprinting, soccer, and rugby. **Objective** To assess the awareness, implementation, and opinion of the worldwide athletes about the Nordic hamstring exercise in preventing hamstring injury.

**Design** A cross-sectional study.

**Setting** An online survey for different sports.

**Patients (or Participants)** A total of 1142 male and female athletes from different sports (American football, athletics, badminton, baseball, basketball, bodybuilding, boxing, cricket, CrossFit, cycling, soccer, gymnastics, handball, ice hockey, ice skating, judo, ju-jitsu, karate, korfbal, lacrosse, modern pentathlon, netball, rugby league, rugby union, running, skateboarding, skiing, snowboarding, softball, squash, swimming, table tennis, taekwondo, tchoukball, tennis, trampolining, volleyball, weightlifting and wrestling) completed the survey.

**Interventions (or Assessment of Risk Factors)** The questionnaire consisted of questions relating to the awareness level, implementation rate and opinion of the Nordic hamstring exercise.

**Main Outcome Measurements** The primary outcomes were awareness level, implementation rate, and opinion of the effectiveness of the Nordic hamstring exercise in hamstring injury.

**Results** A total of 641 (56%) of the athletes were aware of the Nordic hamstring exercise, 519 (45.4%) were implementing the Nordic hamstring exercise in their current practice. Athletes who implemented the Nordic hamstring exercise reported a positive opinion about the program efficacy, with a score of  $8.4 \pm 1$  out of 10.

**Conclusions** Many athletes were aware of the Nordic hamstring exercise and implementing it in their training routine, as they found it effective in decreasing the hamstring injury rates. However, further work needs to be done to educate athletes about the importance of implementing the exercise and its effectiveness in preventing hamstring injury to enhance implementation.

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### THE NORDIC HAMSTRING EXERCISE: AWARENESS, IMPLEMENTATION AND OPINION OF WORLDWIDE PROFESSIONAL AND SEMI-PROFESSIONAL SOCCER PLAYERS AND COACHES

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**Background** Soccer has high injury risk, especially for hamstring muscle injuries, and the Nordic hamstring exercise is a well-known intervention to prevent them.

**Objective** To assess the professional and semi-professional soccer players and coaches' awareness, implementation, and opinion of the Nordic hamstring exercise.

**Design** A cross-sectional study.

**Setting** An online survey for all continental football federations.

**Patients (or Participants)** A total of 812 male (88.3%) and female (11.7%) professional and semi-professional soccer players and coaches completed the survey.

**Interventions (or Assessment of Risk Factors)** The questionnaire consisted of questions relating to the awareness level, implementation rate, and opinion of the of the Nordic hamstring exercise. Questions development was guided by several authors whose expertise is in sport medicine and injury prevention.

**Main Outcome Measurements** The primary outcomes were awareness level, implementation rate, and opinion of the effectiveness of the Nordic hamstring exercise in reducing hamstring injury.

**Results** A total of 395 (48.6%) of professional and semi-professional soccer players and coaches were aware of the Nordic hamstring exercise, 355 (43.7%) were implementing the Nordic hamstring exercise in their current practice. Participants who implemented the Nordic hamstring exercise reported a positive opinion about the program efficacy, with a score of  $8.6 \pm 1$  out of 10.

**Conclusions** Further work needs to be done to educate soccer players and coaches about the importance of implementing the Nordic hamstring exercise and its effectiveness in preventing hamstring injury to enhance implementation of the Nordic hamstring exercise.