Setting High schools in Alberta, Canada.

Participants Female students who reported playing one of the top ten team sports for participation (i.e., baseball, basketball, lacrosse, soccer, volleyball, football, rugby, ringette, field hockey, ice hockey).

Assessment of Risk Factors

A 45-minute survey included questions regarding demographic information, sport participation, and one-year injury and concussion history.

Main Outcome Measurements Self-reported injuries sustained in the past year.

Results 51.7% (1048/2029) of high school students completing the survey were female and 481/1048 (45.9%) reported playing at least one team sport. Of these, 51.4% reported at least one sport-related injury and 8.9% at least one concussion in the past year. Injury rate based on 'most serious injury' reported was highest in ringette (42.9 injuries/100 students/year) and rugby (40.0). The top three most serious injury locations were the knee (24.7%), ankle (21.6%) and head (16.1%). The most common injury types were joint or ligament sprain (26.7%), fracture (13.0%) and concussion (11.8%). Based on all serious injuries reported in female team sports, 73.4% occurred via contact mechanisms (with someone or something). Overuse (16.2%) was the next most common mechanism reported. Of participants that reported concussion as their most serious injury, 100% were attributed to contact mechanisms (38.9% contact with someone; 61.1% contact with something).

Conclusions Team sport injury rates are high in female high school students. Specific consideration of contact injury mechanisms in female youth team sports will inform development and evaluation of targeted female contact and sport-specific prevention strategies.

238 PREVALENCE OF MENSTRUAL DISORDERS AMONG GERMAN FEMALE ELITE ATHLETES

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Background A healthy menstrual cycle affects the athletic performance in training and competition. However, the prevalence of menstrual cycle disorders among elite athletes is unclear.

Objective To assess the prevalence of menstrual disorders among German female elite athletes in 2019 and 2020.

Design Retrospective cohort study.

Setting German female youth and adult elite athletes.

Participants 532 female elite athletes (19.5 ± 5.0 years; 170.0 ± 7.3 cm; 62.1 ± 11.4 kg) were included in this study. All athletes were members of the German funding for high performance sports.

Assessment of Risk Factors Menstrual disorder, sport discipline, age, BMI, body fat, training volume.

Main Outcome Measurements All athletes completed a baseline gynaecological survey. The independent samples t-test and ANOVA were used for statistical analysis (p<.05).

Results 118 of all 532 of the female athletes (22.2%) had an irregular menstrual cycle. The most prevalent menstrual disorders are oligomenorrhea (41.9%), secondary amenorrhea (25.0%), primary amenorrhea (11.3%), dysmenorrhea (4.0%), metrorrhagia (2.4%), hypermenorrhea (1.6%), polymenorrhea (0.8%) and others (12.9%). There is a significant difference in the prevalence of menstrual disorders among sport disciplines (p=.000, f=.214). The highest prevalence of menstrual disorders occurs among endurance sport athletes (30.9%). Athletes with menstrual disorders have a significantly lower BMI (p=.014, d=.258) and lower percent body fat (p=.000, d=.392) compared to athletes with normal menstrual cycles. There is no significant difference in age (p=.101, d=.172) and training volume (p=.100, d=.172) between the groups.

Conclusions Our research showed a high prevalence of menstrual disorders among German female elite athletes. The results suggest that especially athletes with low BMI and low percent body fat are at a high risk for menstrual disorders. Further research is required to investigate the effects of menstrual disorders on athletic performance and long-term health.

239 MONITORING WELLBEING AND PERCEIVED EXERTION IN RELATION TO INJURY RISK IN ELITE FEMALE FOOTBALL PLAYERS OVER 2 SEASONS

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Background There is a gap in understanding how to use wellbeing and load measures in football, particularly in women.

Objective To describe the association of wellbeing and session-rating of perceived exertion (sRPE) with injury risk.

Design Prospective cohort study.

Setting Elite football team from the Spanish first division.

Participants 28 elite female players were followed during the 2017–2018 and 2018–2019 seasons.

Assessment of Risk Factors Fatigue, sleep quality, muscle soreness, stress and mood (questionnaire from 1-worst to 5-best), exposure time in training and matches, RPE (0–10) and injuries were daily recorded. Daily and 7-day rolling z-scores were calculated for wellbeing items; and rolling 7 and 28-day sums, uncoupled 7 to 28-day ratios and week-to-week changes for sRPE [time x RPE in arbitrary units (au)]. In addition, the median sRPE of each session was estimated to account for the load of sessions where injuries occurred.

Main Outcome Measurements The association of wellbeing and sRPE variables with non-contact injuries requiring 4 or more days of absence occurring on a given session was investigated using linear mixed models.

Results The probability of injury was higher in matches (1.36%) than in training (0.44%, p=0.001). In training, sessions with high median sRPE (>525 au, 0.87 vs. the rest 0.35%), high 7-day loads (>2095 au, 0.76 vs. 0.31%), low 28-day loads (<5020 au, 0.71 vs. 0.32%) and worse than usual (<-1 z-score) 7-day fatigue (0.82 vs. 0.35%) and muscle soreness (1.19 vs. 0.28%) were associated with higher injury risk (p<0.05). Moreover, pre-match worse than usual daily sleep quality (3.03 vs. 0.85%), stress (4.55 vs. 0.92%) and mood (2.74 vs. 0.95%) showed higher injury probabilities (p<0.05). Interactions between wellbeing and sRPE were also observed.

Conclusions This information in combination with other relevant factors and expert knowledge can be helpful to guide player monitoring and decision making.

240 ABSTRACT WITHDRAWN

241 ABSTRACT WITHDRAWN

242 THE EPIDEMIOLOGY OF INJURY IN ENGLISH PROFESSIONAL WOMEN'S FOOTBALL: A PROSPECTIVE COHORT STUDY

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Background Despite the professionalization of women's football the incidence and prevalence of injuries occurring within England is currently unknown.

Objective To estimate the incidence, prevalence and nature of injury in a single professional Women's football squad over one season (2018/2019)

Design Prospective single site cohort study.

Setting Professional women's football squad competing in the English Women's Championship.

Patients (or Participants) 25 players with a professional contract. Ethical approval was obtained from Leeds Beckett University.

Interventions (or Assessment of Risk Factors) Data collection procedures followed the UEFA consensus guidelines. Player exposures were recorded via GPS for all football related activity

Main Outcome Measurements Incidence of injury per 1000h of exposure, prevalence and severity of injury per anatomical site, epidemiologic incidence proportion and clinical incidence to provide measures of injury burden and resource management.

Results The incidence of injury was 8.04/1000 h (95% CI 4.32–11.77), 30.68/1000 h (95% CI 14.61–47.75) during match play and 2.24/1000 h (95% CI: 0.25–4.66) during training. A total of 18 injuries including re-injuries were sustained providing a clinical incidence of 0.72 (95% CI 0.54–0.89) injuries per player. The most common sites of injury were the knee (5/18, 27%) and anterior thigh (3/18, 17%). There was 1 non time loss injury, 3 minimal injuries (16.6%; 1–3 days), 4 mild (22.2%; 4–7 days), 6 moderate (33.3%; 8–28 days) and 4 severe injuries (22.2%; > 28 days). Of the 5 knee injuries, 2 were ruptures of the anterior cruciate ligament via a non-contact mechanism. Epidemiological incidence proportion was 0.44 (95% CI: 0.24–0.74) thus the average probability that any player would sustain at least one injury was 44% (95% CI: 25%–63%).

Conclusions This is the first prospective investigation capturing injury incidence from a cohort of English players. The relatively high proportion of ACL injuries imposes a significant burden on a squad of this size. Multi-site prospective investigations of injury are required

243 LONGITUDINAL DOCUMENTATION OF SELF-REPORTED AND PHYSICAL FUNCTION IN FEMALE ADOLESCENT ATHLETES WITH BILATERAL RECURRENT ANKLE SPRAINS

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Background Recurrent ankle sprains (RAS) are often preventable through sensorimotor training interventions. However, implementation of RAS prevention programs for athletes is often limited because of a lack of resources, time, and understanding of long-term negative consequences associated with RAS. Prospective, longitudinal documentation of self-reported and physical functions in athletes with RAS over the duration of an athletic season without participation in RAS prevention training is needed to highlight an importance of implementation of specific injury managements for athletes.

Objective Determine whether changes in factor contributing to RAS occur in high school female basketball athletes with bilateral RAS following six months.

Design Prospective cohort study.

Setting High school basketball facilities.

Participants Eighteen high school female basketball athletes with bilateral RAS (age=15.81±0.40yrs, BMI=21.56±1.70kg/m²) participated. Participants were defined as having RAS if they have sustained a minimum of two acute lateral ankle sprains on the same lower extremity.

Assessment of Risk Factors Participants completed patient-generated, clinician-generated, and laboratory-based outcome assessments in two testing sessions separated by six months. No specific injury prevention program for RAS was provided during the duration of an athletic season.

Main Outcome Measurements The Cumberland Ankle Instability Tool (CAIT) was used to assess self-reported ankle instability. Foot cutaneous sensation thresholds was assessed using Semmes-Weinstein monofilaments. Rate of force development (RFD) during a single-leg drop landing was quantified with a force platform. Paired t-tests were utilized to examine between-session differences in each dependent variable.

Results There were no differences in CAIT (Right:p=0.831 Left:p=0.688), foot cutaneous sensation thresholds (Right:p=0.177, Left:p=0.199), and RFD (Right:p=0.064, Left:p=0.079) between two testing sessions.

Conclusions No changes in the selected outcome measures occurred in high school female basketball athletes with bilateral RAS following six months, indicating that specific prevention strategies for RAS may be necessary to restore and improve self-reported and physical functions.

244 EPIDEMIOLOGY OF MATCH INJURIES IN SCOTTISH PROFESSIONAL RUGBY UNION

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Background Injury incidence in professional rugby union tends to be greater than other team sports. Epidemiological studies