

**Conclusions** Recreational surfers reveal a considerable injury frequency per 1000 h of exposure, independent of gender, surfer position or side. The greater incidence of lower-limb and shoulder injuries must be underlined, as well as the fact that collision/direct contact represents more than 50% of the injury mechanisms.

## 222 DO PHYSICAL CONTACTS AND HEAD CONTACTS DIFFER IN FEMALE ICE HOCKEY AND RINGETTE? A VIDEO-ANALYSIS STUDY

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**Background** A Canadian study reports the highest concussion rates in ringette and ice hockey, compared to other female team sports. Although high-intensity physical contacts (PC) are prohibited in both sports, player-to-player PCs accounted for 58–64% of injuries.

**Objective** To compare incidence rates (IR) of in-game PCs, head contacts (HC), and suspected injuries in female varsity ice hockey and ringette.

**Design** Cross-sectional.

**Setting** Canadian ice hockey arenas.

**Participants** Female university ringette and ice hockey tournament/playoff games in the 2018–2019/2019–2020 seasons.

**Assessment of Risk Factors** Game video-recordings were analyzed using Dartfish video-analysis software. Validated criteria were used to assess PC intensity (level 1–5), PC type (e.g., trunk contact, push), HC type (i.e., HC1=direct player-to-player, HC2=indirect environmental), and suspected injury (i.e., concussion, musculoskeletal).

**Main Outcome Measurements** Univariate Poisson regression analyses (adjusted for cluster by team, offset by game-minutes) was used to estimate PC and HC IRs and incidence rate ratios (IRRs, 95% confidence intervals) comparing sports.

**Results** Analyses of 36 team-games (n=18 ringette, n=18 ice hockey) revealed that ringette had a 19% lower rate of PCs (IR=310.38 contacts/100 team-minutes, 95%CI;285.40–337.54) than ice hockey (IR=382.48 contacts/100 team-minutes, 95%CI;356.80–410.00) (IRR=0.81, 95%CI;0.73–0.90). Ringette had a 68% higher rate (IRR=1.68, 95% CI:1.22–2.31) of total HCs (IR=17.92 contacts/100 team-minutes, 95%CI;14.71–21.83) compared to ice hockey (IR=10.67 contacts/100 team-minutes, 95%CI;8.28–13.75). Ringette had a 3-fold higher rate (IRR=3.11, 95%CI;1.13–8.60) of suspected injury (IR=1.46 HCs/100 team-minutes, 95%CI;0.72–2.93) compared to ice hockey (IR=0.47 HCs/100 team-minutes, 95%CI;0.22–1.00).

**Conclusions** This study demonstrated a lower rate of PCs in ringette than female ice hockey. However, ringette had a significantly higher rate of HCs and suspected injuries than ice

hockey. These findings can inform future research targeting prevention strategies in both sports.

## 223 INJURY AND ILLNESS EPIDEMIOLOGY DURING THE 53RD FIS NORDIC WORLD SKI CHAMPIONSHIPS 2021 IN OBERSTDORF: A PROSPECTIVE COHORT STUDY

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**Background** Nordic skiing consist of cross-country skiing (CC), ski jumping (SJ) and Nordic combined (NC). Only little injury and illness data from elite competitions in these sports are currently available.

**Objective** To analyse injuries and illnesses during the FIS Nordic World Ski Championships 2021.

**Design** Prospective cohort study.

**Setting** FIS Nordic World Ski Championships in Oberstdorf, Germany, 23<sup>rd</sup> February to 7<sup>th</sup> March 2021.

**Participants** All registered athletes (n=663).

**Main Outcome Measure** Daily report of newly incurred injuries and illnesses according to the respective IOC consensus statement (2020) by the medical teams.

**Results** About half of the nations (32/65), covering 51.6% of the registered athletes (n=342), participated in the study and returned 88.4% of the daily report forms. During the 12 championships days, 16 injuries were reported (incidence rate: 4.6%, 95%CI 2.4 to 6.9%), 12 in CC and 2 injuries each in NC and SJ. Six injuries affected the upper and 6 the lower extremities, 2 the lumbar-sacral spine/buttock and 2 the head. Most injuries occurred suddenly (n=13), 3 gradually. Eleven injuries (69%) were non-time-loss, 4 injuries resulted in an estimated time-loss of 3–7 days, 1 in an estimated time-loss of 21 days (fracture of metacarpal bone).

Out of the 16 illnesses (incidence rate: 4.6%, 95%CI 2.4 to 6.9%), 11 were reported in CC, 3 in NC and 2 in SJ. Regarding etiology, 5 illnesses were environmental (4 exercise-related and 1 non-exercise related), 4 infectious, 3 allergic, 2 metabolic/nutritional, 1 degenerative/chronic and 1 unknown. Most illness occurred suddenly (n=10), 4 gradually and 2 had a mixed mode of onset. Twelve illnesses (75%) were non-time-loss. Three illnesses resulted in an estimated time-loss of 3 days, 1 in an estimated time-loss of 20 days (COVID-19 infection).

**Conclusion** The injuries or illnesses incidence rate was lower than in Winter Olympic Games. The low illness rate might be due to COVID-19 hygiene measures.

## 224 ABSTRACT WITHDRAWN