

Background Injuries in parasport are not well explored and may lead to detrimental effects in players with pre-existing disabilities. Previous parasport injury studies have focused on elite sledge hockey during winter Paralympics. Reported injury rates in sledge hockey are higher than other winter parasports.

Objective To examine concussion and injury rates, locations, types, mechanisms, and risk factors in sledge hockey.

Design Cross-sectional survey.

Setting Sledge hockey players across all levels of play.

Participants Sledge hockey players (ages ≥ 14 years) recruited worldwide following the 2019–2020 season through email, social media and word of mouth communication. Ninety-two players initiated the survey and 77 (83.7%) answered questions related to sledge hockey injuries.

Assessment of Risk Factors Risk factors considered participant demographics (e.g., age, sex, disability, level of play).

Main Outcome Measurements One-year injury rates (IR) and incidence rate ratios (IRR) were estimated based on univariate Poisson regression analyses. Injury proportions by type, location, and mechanism were described.

Results There were 47 injuries reported including 16 concussions in 9/77 (11.7%) players and 31 non-concussion injuries in 20/77 (26.0%) players. The overall IR was 13.2 injuries/1000 athlete-exposures (95%CI;9.6–17.6). The game IR (28.4 injuries/1000 game-exposures, 95%CI;18.6–41.7) was significantly higher than for practices (4.4 injuries/1000 practice-exposures, 95%CI;2.2–7.9) (IRR=6.5, 95%CI;3.1–14.5). Significant injury: (1) locations were the head (34.0%), wrist/hand (14.8%) and shoulder (10.6%); (2) types were concussion (36.2%) and bone fracture (8.5%); and (3) mechanism was body checking (42.1% of injuries caused by contact with another player). Age, sex, disability type, and level of play were not found to be injury risk factors.

Conclusions Concussions and upper extremity injuries were the most common sledge hockey injuries reported, with body checking being the most common mechanism. This research will inform the development of sledge hockey injury prevention strategies.

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WHO? WHAT? WHERE? WHY? DESCRIBING THE PATTERNS OF INJURY IN HIGH SCHOOL MALE COLLISION SPORTS

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Background Collision sports (Canadian football, ice hockey, lacrosse, rugby) are popular among Canadian male youth, however it is recognised that collision sports are associated with a high risk of injury.

Objective To describe the patterns of collision sport-related injury in Canadian male high school athletes.

Design Secondary analysis of a cross-sectional survey.

Setting High schools (Alberta, Canada)

Participants 360 male students (of 2029 respondents), who play at least one of Football, Hockey, Lacrosse or Rugby.

Assessment of Risk Factors An anonymous online survey included questions regarding the mechanism, site, type, and nature of collision sport injuries.

Main Outcome Measurements Sport-related injury self-reported in the past year.

Results Of the 2029 survey respondents, 958 (47.2%) were male of which 360 (37.6%) reported playing at least one collision sport. Of all serious injuries reported by males, collision sports accounted for 33% [hockey: 63(17%), football: 41(11%), lacrosse: 9(3%), rugby 8(2%)]. The head/face accounted for the largest proportion of injuries (hockey: 25.4%, football: 24.4%, lacrosse: 33.3%, rugby 50.0%). Concussion was the most common injury in rugby (50.0%) and football (24.4%) and fractures the most common in hockey (27.0%) and lacrosse (44.4%). Contact with another player was the most frequently reported mechanism of injury (rugby: 87.5%, football: 77.1%, lacrosse: 66.7%, hockey: 57.4%), with most injuries related to contact by a player who was bigger or the same size as the injured player (hockey/rugby:100%, lacrosse: 83.3%, football: 81.5%).

Conclusions Sport-related injuries in male collision sports are common, with four sports accounting for 33% of all reported injuries across male Canadian high school sports. Head/face injuries were the most common, with the majority of injuries occurring due to contact with another player. There is scope to consider primary prevention strategies such as contact training and rule changes to address the risk of injury in youth collision sport.

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ABSTRACT WITHDRAWN

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HIGH LEVEL OF ORAL DISEASE AND SELF-REPORTED PERFORMANCE IMPACTS IN MALAYSIAN ELITE ATHLETES

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Background Oral health can affect performance, including athletes who always need to be in their best conditions during training and competitions. However, oral health awareness has never been a priority among Malaysian athletes.

Objective This study primarily aimed to assess the association between oral health status and self-reported impact on athletes' sports performance, using the Oral Health Screening Toolkit for Athletes developed by University College London, UK.

Design/Setting/Participants This is a cross-sectional study using convenience sampling. Data were collected among elite athletes registered under the National Sport Council (NSC), Malaysia.

Interventions/Outcome measures Demographic data, self-reported questionnaire and clinical oral examination were recorded and collected.

Result We recruited 249 athletes with the median age of 20 (range 13–43). Active caries (ICDAS code ≥ 3) was found in 66.8% athletes with periodontal diseases (BPE code ≥ 1) in 84.9%. A quarter of those with both diseases were youth athletes. Pericoronitis was also found in 4.7% athletes while 9% have pulpitis, abscess or ulcer (PUFA). Approximately 23.2% of athletes felt their oral health was not good during data collection with 32.5% reported moderate-to-severe impact of oral-related problems on their sports performance over the past 12 months: oral pain (10.5%), difficulty participating in training and competition (11.4%), performance affected (6.4%) and reduction in training volume (6.3%). Chi-square test of independence showed that there is a relationship between both diseases with ethnicity and sports type (individual-team or endurance-strength-mixed). Periodontal diseases were also seen related to age and education level. Approximately 5.5% of the athletes reported never seeing a dentist before.

Conclusion High levels of oral diseases were found in Malaysian elite athletes with common self-reported impacts on performance. This study hopes to create oral health awareness among Malaysian athletes and authorities so that it will be proportionately integrated into athlete health programmes in the future.

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THE INFLUENCE OF SUBCLINICAL HYPOTHYROIDISM ON PHYSICAL PERFORMANCE OF ELITE ATHLETES

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Background Currently, there is no consensus on the frequency of subclinical hypothyroidism in athletes and its effect on exercise tolerance.

Objective The purpose of the study was to explore the prevalence of subclinical hypothyroidism in elite athletes and to identify its impact on physical performance indicators.

Main Outcome Measurements A retrospective analysis of data from a random sample of outpatient records of 1000 elite athletes aged 15 to 36 years who underwent medical screening, including clinical, laboratory and instrumental examinations.

Results According to the results of a laboratory study, subclinical hypothyroidism was detected in 95 (9.5%) athletes in the sample. In athletes with subclinical hypothyroidism, the average thyroid stimulating hormone (TSH) level was 5.53 ± 0.24 mME/l, while in unaffected athletes it was 1.89 ± 0.31 mME/l ($p < 0.01$). The level of free T4 was within normal values and in the group with hypothyroidism was 12.0 ± 0.48 pM/l, whereas in unaffected athletes 17.2 ± 1.13 pM/l ($p < 0.05$).

When analyzing bicycle ergometry data, a significant correlation was found between hypothyroidism and heart rate at 1st, 3rd and 5th minutes of recovery after the test ($p < 0.001$), and with diastolic blood pressure at the 3rd minute of recovery ($p < 0.001$). A significant positive correlation was also found between TSH level and the same set of recovery

indicators ($p < 0.0001$). There was also a significant negative relationship between the level of TSH and the intensity of the training regime ($p < 0.005$) and with sports proficiency grade ($p < 0.0001$).

We did not find any significant effect of TSH and hypothyroidism on exercise tolerance and aerobic reserve.

Conclusions The study showed a high prevalence of subclinical hypothyroidism in elite athletes, affecting 9.5% of the sample. The presence of subclinical hypothyroidism significantly contributed to a slower recovery of parameters of the cardiovascular system after at bicycle ergometer test, without affecting exercise tolerance.

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THE EFFECT OF SLEEP ON THE PREVALENCE OF SPORTS INJURIES IN ATHLETES

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Background Many sports athletes are injured every year. Sleep quality and quantity play an important role in this.

Objectives A systematic review was carried out on the correlation between sleep and the prevalence of sports injuries.

Design Systematic review

Methods Screening of articles in PubMed, Web of Science, Cinahl and Cochrane Library on the keywords ‘Sleep’, ‘Circadian rhythm’, ‘Insomnia’, ‘Jetlag’, ‘(Elite) athletes’, ‘(Sports) injuries’ and ‘Rehabilitation’ published between January 1, 2010 and December 3, 2020. Systematic review made after assessment of the articles for methodological quality.

Results In general, athletes do not meet the total sleep time recommended by the American Academy of Sleep Medicine (AASM) and the National Sleep Foundation. One of the reasons for an increased risk of sports injuries is sleep deprivation. Sometimes sleep extension is needed to partially repair this by scheduling a short nap of about 30 minutes in the morning or early afternoon. In addition to sleep quantity, poor sleep quality also plays a role in the risk of sports injuries. Both, sleep quantity and quality, are negatively affected by air travel over different time zones, which is further enhanced by a heavy training schedule.

Conclusion Poor sleep quantity and/or quality have a negative effect on the prevalence of sports injuries. Sleep deprivation adversely affects sports-related parameters including physiological biomarkers related to injuries. In addition to sleep quality and quantity, training modalities, injury history, sleep disorders, gender, well-being and health are also associated with injury risks. Further research is needed to clarify the correlation between sleep and injury risk and to formulate practical recommendations.

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THE IMPACT OF SLEEP ON THE RECOVERY OF SPORT INJURIES

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