experience, were eligible. From those, 741 participants completed at least one of the health monitors and were included in the analysis.

Intervention The Runfitcheck is an online intervention to stimulate injury-preventive behavior. The participants were allocated to one of two intervention groups or the control group. One intervention group obtained access to the Runfitcheck and was fortnightly stimulated to use Runfitcheck, the other intervention group was attended to the Runfitcheck once. Participants were followed over a period of four months.

Main outcome measures The main outcome measure was a new RRI, measured fortnightly with the Oslo Sport Trauma Research Centre overuse injury questionnaire.

Results The time to the occurrence of the first RRI did not differ between the study groups (Wald Chi-square 0.893). There was also no difference in risk of a new RRI in the group attended to the Runfitcheck once (OR 1.22 (95% CI:0.86–1.74)) nor in the active approach group (OR 1.01 (95%CI: 0.71–1.45)) compared to the control group. Furthermore, the onset of the new RRIs did not change over time (OR 0.96 (95%CI: 0.91–1.01)).

Conclusions The online intervention Runfitcheck was not effective in reducing the risk of new RRIs in adult novice runners. More research is needed to determine how injuries in novice runners can be prevented.

213 DEVELOPMENT OF A PROTOCOL TO EVALUATE BASEBALL PITCHER'S WORKLOAD AND PREVENTION OF INJURY

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10.1136/bjsports-2021-IOC.196

Background Pitch counts are one measure of workload in baseball. Newer research indicates pitch counts underestimate true total workload. Thus, current monitoring systems gauging throwing injury threshold may be considered inadequate.

Objective Develop a novel technique to determine workload in baseball pitchers to provide an implementable method for prevention of throwing related injuries.

Design Prospective observational study

Setting Academic medical center and community baseball fields.

Participants Pitchers aged 13–18 from the 2019 to 2021 seasons.

Assessment of Risk Factors The independent variable was innings pitched, grouped by 1–2 innings, 3–4 innings, 5–6 innings, and 7 innings.

Main Outcome Measurements Workload percent, calculated by multiplying volume of total gameday pitches by intensity, was the primary measure. Intensity was determined by maximum pre-season velocity compared to game velocity of pitches thrown. Velocity was measured during a preseason practice and the first 10 pitches of each inning. Total gameday pitches included bullpen, warm-up, and game pitches.

Results 147 total pitcher outings, 42 total pitchers, 4 pitching related injuries. Total game pitch counts ranged from 17 to 219 (mean 78.8, SD 38.7). Velocity ranged from 74.4 to 136.5 km/hour. Intensity ranged from 0.68 to 1.26 with a mean of 1.0 (SD 0.09). ANOVA was completed with significant differences noted for total pitches ($p<0.001$) and workload percent ($p<0.001$). Post hoc analyses for total pitches and workload percent resulted in significant differences ($p<0.001$) between all inning groupings except innings 5–6 compared to inning 7.

Conclusions Our workload model indicated that workload and pitch counts are associated. As we gather more data (2022 season), if workload and injuries are significantly associated, then by extension total gameday pitch count would become a correlate to workload and injuries. Workload monitoring using our system may lead to prevention of injuries in baseball pitchers.

214 SPORTS INJURY PREVENTION PRACTICES AND DIRECTIONS FOR IMPROVEMENT: A MULTI-CENTRE QUALITATIVE STUDY IN PHYSICAL EDUCATION TECHER EDUCATION STUDENTS

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10.1136/bjsports-2021-IOC.197

Background Injury risk is high in Physical Education Teacher Education (PETE) student. Insight in the population's perspectives on injury prevention supports developing context-driven preventive strategies.

Objective The objective was to describe sports injury prevention practices from PETE students' perspective and map their suggestions for improvement.

Design Qualitative study.

Setting PETE programs at Dutch Universities of Applied Sciences.

Participants Recruitment took place via convenience sampling. Students were invited to participate by e-mail. Participants were informed about the study's goals and procedures and completed informed consent and a baseline questionnaire (e.g., age, sports participation, injury history). Inclusion criteria for participants were: 1) completed the first three years of the PETE program; 2) understanding of the Dutch language at the native level. In total 21 participants from four different PETE schools were included.

Main Outcome Measurements We conducted semi-structured interviews, which were transcribed verbatim and analysed using the thematic analysis method.

Results All the participants mentioned applying various preventive measures. They described injury prevention as a standard part of daily life an approached it in a dynamic way. Their primary strategy was to balance load and recovery. The critical factors to apply injury prevention successfully mentioned were: communication, learning what works, self-management, shared responsibilities, and social support. The main motives for injury prevention were to care for the body and perform well (e.g., academic success, sports). Given the participants, injury prevention could be improved in various ways, but mostly by enhancing the PETE program's load management

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(e.g., schedules) and offering injury prevention education (e.g., theory, practical skills).

Conclusions This study provided insight into how injury prevention is shaped in practice, identified critical factors and motives for injury prevention, and mapped recommendations for its improvement from the target population. The findings support the development of context-driven preventive strategies in the PETE population.

215 COMPREHENSIVE ASSESSMENT OF RISK FACTORS AND CONSTANT LOAD MONITORING PREVENT OVERUSE INJURIES OF EXTENSOR MECHANISM IN ELITE VOLLEYBALL PLAYERS

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10.1136/bjsports-2021-IOC.198

Background Overuse injuries of extensor apparatus are common and debilitating in elite volleyball. Addressing the internal risk factors and monitoring the training load are key for injury prevention.

Objective To highlight the effectiveness of preventive measures on an elite male volleyball team in 2 consecutive seasons.

Design Overuse injury incidence of extensor mechanism, taken preventive measures and assessment strategies of injury risk factors in an elite level man volleyball team are investigated retrospectively using records of the team.

Setting Male volleyball team competing in elite division.

Participants The players of Halkbank Volleyball Team during the 2019–2020 and 2020–2021 seasons except liberos.

Assessment of Risk Factors Functional movement system test and Y-balance test were conducted and 1-RMs were assessed after pre-participation evaluation. Linear periodization was used during the pre-season preparation period. Individual strength-mobility deficits and asymmetries of players were targeted with supervised exercise sessions in addition to regular fitness trainings. The players' total load on extensor apparatus during trainings and games were monitored with the G-Vert, a commercially available wearable device measuring vertical displacement and jump count. The target values as maximum tolerable jump counts were established for each position and for each player who had previous extensor apparatus injury. The training volume was adjusted when the target value is achieved.

Main Outcome Measurements The primary study outcome measure was the time loss due to extensor mechanism injuries.

Results A comprehensive approach to prevent overuse injuries of the extensor mechanism yielded excellent results in an elite division volleyball team. There was no time loss due to overuse injuries of extensor apparatus despite the heavy training and the game load.

Conclusions Reducing and monitoring the internal risk factors combined with constant monitorization and establishment of a target jump load in volleyball prove to be useful. Considering the technical difficulties to conduct a high-quality randomized research on elite athletes, comprehensive preventive measures applied for two years show promising results.

216 WHO'S KEEPING SCORE? THE EFFECT OF A SCORE DIFFERENTIAL BASED RUNNING TIME RULE ON HEAD IMPACT RATES IN CANADIAN HIGH SCHOOL TACKLE FOOTBALL

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10.1136/bjsports-2021-IOC.199

Background Due to postulated associated long-term health issues in athletes, concussions and head impacts are of concern in tackle football. Football Canada mandated a game clock running-time rule (RTR) in the event of a second-half 35-point difference in games, citing player safety as the main rationale.

Objective To examine the effectiveness of RTR on reducing game-related head impact rates in Canadian high school football using video analysis.

Design Cross-sectional.

Setting Calgary, Canada.

Participants Players on two junior division high school teams (ages 15–16) in Calgary, Alberta were included. Fourteen games from the 2019 season (Team A: n=8, Team B: n=6) were videotaped for analyses.

Assessment of Risk Factors Traditionally, the clock stops between plays until the referee signals for the clock to resume. With RTR the clock continues (except during exceptional circumstances such as injury, scores, or timeouts) in the event of a point differential of 35 points or greater in the second half of a game.

Main Outcome Measurements Head impacts were reported as incidence rates (IR) [# head impacts/100 player-game-minutes (PGM) (95% confidence intervals (95% CI)]. Incidence rate ratios (IRR), offset for PGM, adjusted for game outcome (e.g., win, loss) and clustering by team game were used to compare score differential in games with and without running-time (≥35 points vs. <35 points) by team unit (e.g., offense, defense).

Results RTR games yielded 24% fewer plays than non-RTR games (IRR: 0.76, 95% CI: 0.68, 0.84). Head impact IR in RTR games were lower than non-RTR games for offensive units (IRR:0.80; 95% CI:0.68, 0.95) and defensive units (IRR:0.76; 95% CI:0.59, 0.99). There were no differences in special teams units.

Conclusions RTR reduced game-related head impact IRs in this cohort for both offensive and defensive units. Sport governing bodies should consider the potential effect of RTR on injury and concussion rates at the youth level.

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