of 18 years, fit for general anaesthetic, with no contraindications for arthroscopy or MRI, and prepared to undergo both. A standard knee arthroscopy was performed and the intra-operative findings were compared with those of the MRI, using the International Chondral Research Society (ICRS) grading for chondral damage, and the presence or absence of a meniscal tear. All MRIs were performed on either a 1.5T or 3.0T MRI machine, using standard sequences.

Results: 719 patients were recruited over a period of 6.5 years. Their average age was 52 years (standard deviation, SD 5.2), the male:female ratio was 493:226. Kappa scores with standard errors (SE) for agreement between MRI and knee arthroscopy were 0.41 (SE 0.1) for medial meniscal tears, and 0.44 (SE 0.1) for lateral meniscal tears. For the grade of chondral damage, the Kappa scores with SE values were 0.09 (0.1), 0.17 (0.1), and 0.22 (0.07) for anterior, medial and lateral compartments respectively. Using areas under the receiver operating characteristic curves, we found clinical assessment was more accurate than MRI for diagnosis of lateral meniscal tears (P<0.001), and of similar accuracy for the diagnosis of medial meniscal tears (P=0.12).

Discussion: MRI had relatively poor correlation with arthroscopic findings for grading chondral damage and was less accurate than clinical assessment for the diagnosis of lateral meniscal tears. Other research has suggested that MRI is overused in clinical practice and may increase the number of knee arthroscopies performed. Up to 40% of patients diagnosed with a meniscal tear on MRI had no meniscal tear at arthroscopy. Insufficient accuracy will undermine the validity of any research in which this imaging modality has a primary role in the study methodology.

Conflict of interest declaration: My co-authors and I acknowledge that we have no conflict of interest of relevance to the submission of this abstract.

S70

The association between prescribed and measured delivery intensity in elite male cricket fast bowlers

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Background: A common practice among sport scientists is to prescribe a targeted training load for each training session. Loads captured in training should ideally align with what was prescribed to ensure healthy adaptations. Otherwise, maladaptations to training may occur, predisposing the athlete to overreaching, burnout, illness, or injury. Most workload research in cricket fast bowling has not measured the intensity of a delivery; a key component in profiling the demand of an activity. Elite fast bowlers in Victoria have access to instantaneous feedback on their bowling speed during indoor training that may help them adhere to a prescribed delivery intensity throughout a session. Therefore, the purpose of this investigation was to determine the association between prescribed and measured delivery intensity operationalised as bowling speed.

Methods: Six elite male fast bowlers participated in this longitudinal, repeated-measures study conducted during the cricket pre-season of 2018/19. The pre-season bowling programme comprised 14 bowling sessions over 8 weeks (total of 570 deliveries per participant). Each session was planned with a fixed bowling volume (number of deliveries) and prescribed delivery intensity (absolute bowling speed individualised to each participant). Seven prescribed absolute bowling speed thresholds (delivery intensities) were derived and used for each bowler; these were based on approximate matching of absolute ball speeds to relative peak PlayerLoadTM data at 70%, 75%, 80%, 85%, 90%, 95%, and 100% profiled in the 2017/18 season. Absolute bowling speed data was converted to a relative peak for each participant and used for statistical analysis.

Mixed-effects linear regression was used to determine the association between prescribed and measured delivery intensity, while controlling for clustering of repeat trials for each participant. Statistical analyses were conducted in Stata, with statistical significance was set at p < 0.05.

Results: There was a significant, moderate positive relationship between prescribed and measured delivery intensity (r = 0.37, p = 0.0112). Relative bowling speed was on average 11–17% higher than prescribed, across prescriptions of 70-80%. This difference was reduced to 2.5% at the prescribed delivery intensity of 90%.

Discussion: As observed in recent studies, relative bowling speed is markedly elevated at lower prescribed delivery intensities. These findings indicate fast bowlers have difficulty in adhering to lower planned delivery intensities despite instantaneous feedback. Sessions planned at lower prescribed delivery intensities may result in larger variability in load experienced than those planned at higher intensities and contribute to unintended maladaptation's.

Conflict of Interest Statement: "Adrian Mott and Justin Forbes are employees of Cricket Victoria. The authors declare no other conflicts of interest."

S72

Invest in our future! Exploring the athletes' perspectives and experiences of injury prevention practices in women playing elite Australian Football

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Background: Women playing in the national elite Australian Football League for Women (AFLW) have a ten times greater risk of serious knee injury than men. Efficacious injury prevention programs exist for team ball-sports, yet their implementation is generally poor. Little is known about how women playing elite team ball-sports perceive and experience injury prevention programs in practice. Understanding the end-user's (athlete's) perspective is essential to improve program uptake and adherence. In this study we explored the athletes' perspectives and experiences of injury prevention practices in the AFLW.

Methods: We recruited a convenience sample of 13 athletes from three Melbourne based AFLW clubs who had developed and embedded an injury prevention program. Semi-structured interviews were audio-recorded in 2018 (post-Season 2), transcribed verbatim, analysed with a thematic analysis approach, and classified within the Socio-Ecological Model (SEM).

Results: Athletes were on average 25 years old (range 19–31), played a median of 2 AFLW seasons (range 1–2), and had a mean of 8.2 years (range 2-15) of Australian Football experience. Women playing elite Australian Football: 1) believe injury prevention programs can prevent injuries, enhance performance and prolong their football career, 2) perceive that injury prevention practices vary between and within AFLW clubs, 3) believe injury prevention program adoption and implementation is complex and multi-factorial, and 4) think implementing injury prevention programs in the AFLW could be enhanced through education and resource allocation. Barriers to program adoption included lack of knowledge and time, and competing demands. Holistic, gender-specific education, resources and a positive club culture facilitated program use. Athletes suggested that full-time professional contracts and improved resources might enhance implementation. Mapping our results onto the SEM highlighted that athletes perceive that individual, interpersonal, community, and organizational levels are important in sports injury prevention.

Discussion: Women playing elite Australian Football have perspectives and experiences that add considerable value to injury prevention program development and implementation. Their beliefs provide insight into strategies that might enhance player program adherence. Varied experiences and knowledge reveal the need to customise program content and education for different skill and literacy levels. Our findings support engaging athletes as critical stakeholders who are well-positioned to inform injury prevention program development.

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S84

Empowering the future generation of teachers to promote optimal academic outcomes through physical activity: Transform-Ed!

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Objective: The physical activity levels of children in Australia are critically low and correlate with reduced academic achievement and poor health outcomes. Schools provide an ideal setting for physical activity interventions to help children move more. However, a lack of time and teacher overload are consistently mentioned as barriers to the sustained implementation of physical activity programs by teachers in schools. We know the quality of initial or pre-service teacher education has a significant impact on learning and teaching outcomes more broadly, but little is known about the implementation and effectiveness of embedding physical activity interventions in initial teacher education. Transform- Ed! is a novel active pedagogy intervention embedded in initial teacher education. It equips future teachers with innovative strategies to promote optimal academic outcomes through meaningful physical activity in the classroom. Framed by implementation science, this research investigated the reach, effectiveness, adoption, adaption, implementation and maintenance of the Transform-Ed! program, when embedded within the first year of an Australian Bachelor of Education (Primary) degree. A further aim was to provide guidance for the scale-up of the program.

Methods: Pre/post surveys and post-program interviews and focus group discussions were conducted with key stakeholders (n = 5), lecturers (n = 6), and pre-service teachers (n = 274) involved in the 12-week Transform-Ed! program. The design, implementation, and evaluation of the study were systematically guided by all five dimensions of the RE-AIM (reach, effectiveness, adoption, implementation, and maintenance) framework. Linear mixed models, descriptive analysis and a framework approach were used to analyse the data.

Results: Significant improvements were observed in pre-service teachers' willingness, confidence, and competence to implement physically active pedagogic strategies following the intervention. Significant improvements were noted in pre-service teacher confidence and competence in the delivery of such strategies and their perceived effectiveness on student outcomes, while perceived barriers decreased. High adherence was consistently reported and the program was maintained after completion of the implementation trial. Four key themes spanning multiple dimensions and participant levels informed recommendations for program scalability: an "inter-systemic approach", a "co-design" approach, "embedded in professional practice", and "evidence of impact" on teacher practice.

Discussion: Anchored in real-world settings and tethered by implementation science, this RE-AIM evaluation suggests Transform-Ed! could have the potential to advance the teaching capability of teachers, and improve the learning experience and physical and academic outcomes of children.

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S85

Relationships between trunk morphology and strength with non-contact lower limb injuries in elite rugby league and Australian football players

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Background: Non-contact lower limb injuries (NCLLI) are common within the National Rugby League (NRL) and Australian Football League (AFL). Smaller lumbar multifidus at L5 (LM L5) cross-sectional area (CSA) and lower levels of trunk and hip extension and knee flexion strength have been associated with increased NCLLI risk in AFL players. However, such associations have not been reported in the NRL. This study aims to explore relationships between NCLLI, trunk morphology and isometric trunk and hip extension strength in NRL and AFL players.

Methods: NRL and AFL players had their LM L2-L5 and quadratus lumborum (QL) CSA (n=238), and isometric trunk and hip extension strength (n=153) measured using ultrasonography and a novel field-based test in preseason. Isometric trunk and hip extensor strength were measured using a 65s maximal voluntary isometric contraction (MVIC) protocol (5s MVIC, 5s off, 45s MVIC, 5s off, 5s MVIC). Team medical staff reported all NCLLIs sustained in the subsequent competitive season. The associations between LM and QL CSA, 5s and 45s MVIC, age, and previous injury, and prospectively occurring NCLLI were analysed using univariable and then multivariable logistic regression. Logistic regression analysis was also performed for the most sustained NCLLI (hamstring and knee).

Results: Seventy-two players sustained a NCLLI in the 2020 competitive seasons (51 NRL, 21 AFL). From univariable logistic regression previous injury increased the risk of any NCLLI in NRL (OR=2.43, 95%CI=1.16-5.09, p=0.019). Reduced 5s MVIC (OR=1.00, 95%CI=1.00-1.01, p=0.012), increased QL CSA (OR=1.55, 95% CI=1.05-2.38, p=0.033) and lower ratio between LM and QL CSA (OR=0.03, 95%CI=0.01-0.60, p=0.02) increased NCLLI risk in AFL. Pooled hamstring injuries (n=28) were most common and were associated with lower 5s MVIC (OR=0.99, 95%CI=0.99-1.00, p=0.02) and 45s MVIC (OR=0.99, 95%CI=0.99-1.00, p=0.001). Pooled knee injuries (n=21) were associated with both reduced LM CSA (OR=1.35, 95%CI=1.08-1.70, p=0.018) and LM to QL ratio (OR=3.62, 95% CI=1.41- 9.66, p=0.043).

Conclusions: Larger QL CSA and reduced levels of trunk and hip extension strength are observed in AFL players in preseason who sustain a NCLLI in the subsequent playing season. Only previous NCLLI was associated with future risk of NCLLI for NRL players. These results suggest that risk factors for NCLLI are football code specific, and prevention strategies should be tailored accordingly.

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