football leagues. Return to football after such a long break without organized team training might increase the rate of injuries.

**Objective** To investigate the effectiveness of a home-based injury prevention program (IPP) on reducing injuries in semi-professional football players.

**Design** Prospective cohort study based on a randomized controlled trial.

**Setting** Iranian semi-professional male football players.

**Participants** A total of 178 players from 11 clubs participated in study. From the total of 178 subjects (90 subjects in the intervention group and 88 in control group), 10 subjects dropped out due to a positive Covid-19 test, leaving 87 subjects in the intervention group and 81 in the control group for the final analysis.

**Interventions** The IPP consisted of 8 weeks home training program with focus on the most common injury locations. The IPP was addressed strength, mobility and balance via neuromuscular and body-weight training with no equipment.

**Main Outcome Measurements** Non-contact injury rate in the remaining season (8 weeks), training and competition exposure, compliance with the IPP.

**Results** Player compliance with the IPP was very good (94%). Exposure data were comparable between groups. Pooled estimates for total (training and match) incidence per 1000 h was 7.8 for the intervention group and 15.9 for control group. A lower proportion of players in the intervention group experienced injuries (29% [27 of 87]) compared with the control group (75% [61 of 81]); relative risk [RR], 0.41; 95% confidence interval [CI], 0.29–0.61; p<0.001.

**Conclusions** A home-based, unsupervised IPP was shown to be effective in reducing the number of injuries in semi-professional male football players after the Covid-19 break. This indicates that going back to training and match play without accompanying IPP cannot be regarded optimal.

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**Does a Peer-to-Peer Learning Technology Integrated Workshop Facilitate Neuromuscular Training Injury Prevention Program Coach Learning?**

**Background** Workshops are used to educate coaches on Neuromuscular Training (NMT) warm-ups to reduce the risk of youth sport injury. Currently, there is no research assessing different learning strategies and its influence on coaches’ self-efficacy and knowledge after attending a workshop.

**Objective** To evaluate whether a peer-to-peer (P2P) learning technology integrated workshop, improved coaches’ self-efficacy and ability to identify NMT exercise errors compared to a standard workshop.

**Design** Randomized controlled trial.

**Setting** Youth soccer clubs in Calgary, Alberta, Canada.

**Participants** Eighty-five recreational youth soccer coaches.

**Intervention** Coaches within each club randomly attended one of two workshops offered to learn a NMT warm-up: the control workshop (standard instruction), or intervention workshop (technology-integrated instruction), or control workshop (standard instruction).

**Main Outcome Measures** At the end of the workshop, the soccer NMT warm-up exercise test, a video-based test where coaches identify common NMT exercise errors, was completed. At the beginning and end of the workshop, the soccer NMT warm-up self-efficacy scale was completed to assess coaches’ self-efficacy change in their ability to identify NMT exercises errors on a 7-point Likert scale.
Results Mean NMT warm-up exercise test scores were 72% (SD: 13%) for the control and 71% (SD: 13%) for the intervention workshop. Mean change in NMT warm-up self-efficacy scores were 0.98 (SD: 1.33) for the control and 1.77 (SD: 1.19) for the intervention workshop. Multivariable linear regression analyses indicated that workshop delivery method was not associated with the exercise test score (b = 3.45, 95% CI: -10.80 to 3.91, R²=0.13) but was associated with a greater difference in change of self-efficacy scores for the intervention workshop (b = 0.97, 95% CI: 0.26 to 1.89, R²=0.13).

Conclusions A P2P learning technology integrated instructional workshop did not differentially impact coaches’ ability to identify exercise errors, but it did increase coaches’ self-efficacy in identifying exercise errors compared to a standard workshop.

440 EVALUATING EXERCISE FIDELITY DURING NEUROMUSCULAR TRAINING PROGRAMS USING WEARABLE TECHNOLOGY

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Background Evaluating exercise fidelity during neuromuscular training (NMT) warm-ups (i.e., completing prescribed repetitions and performing exercises correctly) is important to inform the dose-response relationship of warm-up programs. Wearable technology can be used to measure exercise fidelity. Objective To determine the accuracy of measuring NMT exercise volume and quality with wearable technology. Design Cross-sectional study Setting Youth basketball; Calgary, Canada Participants Twenty-seven youth basketball players

Assessment of Risk Factors Players wore a triaxial accelerometer on the lower back during an NMT warm-up with concurrent video recording. A trained observer (physiotherapist) used an observation tool to determine whether each athlete performed the prescribed exercise volume and rate posture. Main Outcome Measurements The number of repetitions during running, skipping and jumping were extracted from the accelerometer signal using a custom peak detection algorithm and compared to the prescribed exercise volume. The algorithm accuracy was calculated as a percentage, with the trained observer evaluation through video-analysis considered the gold standard.

For the plank, participants were evaluated on ‘Good Posture (straight body, head to ankle)’ and received a score of ‘Yes,’ ‘No,’ or ‘Partial.’ The coefficient of variation (CV) of the accelerometer signal in all three axes was compared for the three fidelity assessment outcomes. Results The algorithm had an accuracy of 100% for the running, skipping and jumping exercise volume.

Participants who scored ‘Yes’ had a lower CV in the medial-lateral (median: 47.2%) and vertical (42.3%) axes, than participants who scored ‘Partial’ (85.4% and 67.6%) and ‘No’ (115.1% and 115.5%). There were no differences in CV in the anterior-posterior axis.

Conclusions A custom algorithm can be used to measure the number of running, skipping and jumping repetitions. The variability of the accelerometer signal can identify postural changes during a plank. Accelerometer signals may be used to evaluate movement quantity and quality during NMT.

441 LONGITUDINAL CHANGES IN FORCE PLATE MEASURES ARE VALID INDICATORS OF MUSCULOSKELETAL HEALTH IN PROFESSIONAL AMERICAN FOOTBALL PLAYERS

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Background Injuries resulting from repetitive force generation and loading on the musculoskeletal system can lead to long-term musculoskeletal health issues in professional American football players. Objective To determine if changes in force plate measures are valid indicators of musculoskeletal health in professional American football players. Design Retrospective cohort study Setting National Football League, USA

Participants The study included 42 professional football players who underwent pre- and post-season Multi-Directional Stair Test (MDST) assessments. The MDST is a functional test that evaluates lower extremity force production. Results Pre-season MDST scores were significantly higher than post-season scores in all directions except for the anterior-posterior direction (p < 0.05). The between-season change in the anterior-posterior direction was not statistically significant. Conclusions Changes in force plate measures were valid indicators of musculoskeletal health in professional American football players.