Abstracts

**267** A SYSTEMATIC REVIEW OF MUSCULOSKELETAL INJURIES IN PROFESSIONAL GOLFERS

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Background The distribution of professional golfing injuries is poorly understood.

Objective The aim of the study was to perform a systematic review to describe the epidemiology of musculoskeletal injuries in professional golfers.

Design A systematic review using Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines. The databases used were Pubmed, SportDiscus and Embase. The inclusion criteria was published observational research articles relating to the incidence or prevalence of musculoskeletal injuries in professional golfers, which were written in the English language and not restricted by age or gender.

Setting Professional golf.

Main Outcome Measurements Data collected included age, sex, data collection methods, diagnosis, region of injury, side of injury, incidence/prevalence of injury, definition of injury, nature of injury, severity of injury, mechanism of injury, risk factors, length of golfing career, injury management and time to return to sport.

Results Of the 1863 studies identified on the initial search, five studies were found to satisfy the inclusion criteria for analysis. The mean age of the golfers in these studies was 34.8 (± 3.6) years. The gender of patients in included studies was relatively poor with no study satisfying >50% of the quality assessment tool questions and only one study giving a clear definition of how they defined injury.

Conclusions There is a paucity of well-designed epidemiological studies evaluating musculoskeletal injuries affecting professional golfers. Injuries to the spine are the most frequently affected region, followed by the hand/wrist. This study has identified targeted areas of future research that aims to improve the management of injuries among professional golfers.

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**268** A RANDOMISED CONTROLLED TRIAL INVESTIGATING THE CROSS-EDUCATION OF STRENGTH AND POWER FOLLOWING AT-HOME UNILATERAL CALF EXERCISES

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Background Cross-education (CE) describes contralateral muscle function gain following unilateral limb training. CE has the potential to reduce strength and power losses following unilateral limb immobilisation. Despite the potential for wider rehabilitative application, few CE studies have utilised home-based interventions.

Objective Can unilateral home-based strength training eliciting bilateral strength and power increases in the calf?

Design A prospective, randomised controlled trial utilising single-blinding.

Setting The Institute of Sport Exercise & Health, London

Participants Thirty-five healthy participants (21.0±1.5 years) with no resistance training 6 months prior to the study were recruited; thirty-four completed the study.

Intervention Participants were randomised to Intervention (n=20) or Control (n=15). Intervention completed 8 weeks of unilateral straight and bent-knee calf raises at-home, using resistance tubing. Load was self-progressed, sustaining a BORG CR10 score of seven.

Main Outcome Measurements Concentric and eccentric calf peak torque was measured using isokinetic dynamometry at 30°/s. Power output was measured during a single-leg jump using ChronoJump® (Chronojump-Boscosystem). Measurements were taken PRE, MID and POST-intervention.

Results The trained leg increased in strength PRE-POST for concentric (25.8±29.3%, p<0.01) and eccentric (19.5±17.8%, p<0.001) contractions. The untrained leg also increased in strength PRE-POST for concentric (20.5±25.6%, p<0.05) and eccentric (14.8±19.2%, p<0.05) contractions.

Power increased PRE-POST in the trained leg (19.3±4.1%, p<0.01). The untrained leg displayed PRE-POST power increases (18.8±3.4%, p<0.01). Controls displayed no significant changes to power.

In the untrained leg, strength increases were significant PRE-MID (16.3±16.9%, p<0.01) but not MID-POST (1.3±13.7%, p>0.05). The reverse was true for power with significant increases MID-POST (10.3±12.6%, p<0.01) but not PRE-MID (8.3±13.3%, p>0.05).

Conclusions This study demonstrates that unilateral, home-based strength training elicits significant bilateral calf strength and power increases. Additionally, the CE of strength seen prior to power indicates that outcomes secondary to the training type require greater training durations to reach significance. These findings may have rehabilitative potential, however further work is required in clinical populations.

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**269** COMMERCIALY-AVAILABLE INERTIAL MEASUREMENT UNIT UNDERESTIMATES NUMBER OF JUMPS FOR FEMALES MORE THAN MALES: IMPLICATIONS FOR LOAD MONITORING AND INJURY PREVENTION

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Background A high incidence of overuse knee injuries among youth basketball players may be attributed to improperly
managed jump load. Inertial measurement units are effective for counting jumps compared to traditional methods, but devices with a minimum threshold may underestimate total load.

**Objective**
To compare jump counts from a commercially-available inertial measurement unit to traditional counting methods for male and female youth basketball players.

**Design**
Cross-sectional.

**Setting**
Youth basketball practices and games.

**Patients (or Participants)**
46 (19 Female) youth basketball players (ages 13–18).

**Interventions (or Assessment of Risk Factors)**
Jump count and height were recorded using an inertial measurement unit (VERT Classic) and raters counted the number of jumps from a simultaneous video recording.

**Main Outcome Measurements**
The height of VERT Classic jumps was compared between males and females. The total number of jumps recorded by the VERT Classic and evaluated by video raters were compared using intraclass correlation coefficient (ICC(3,k)), mean offset, and Bland and Altman limits of agreement.

**Results**
Males (14.1 ± 3.2) had a greater jump height than females (9.9 ± 1.3', p<0.001). For males, VERT Classic jumps had excellent reliability with video-counted jumps (ICC(3,k)=0.969), with a mean offset of -1.9 (fewer VERT Classic) and limits of agreement -7.1 to 3.2 jumps. For females, VERT Classic jumps had excellent reliability (ICC(3,k)=0.916), with a mean offset of -9.3 (fewer VERT Classic) and limits of agreement -28.2 to 9.6 jumps.

**Conclusions**
The VERT Classic can provide an estimate of jump load and provides a tool to monitor jump load in relation to overuse knee injuries in youth basketball players. Female youth basketball players appear to perform more jumping movements that are not registered by the VERT Classic compared to males. Female youth basketball players may need an inertial measurement unit with a lower height threshold for jump count in order to more accurately monitor total jump load.

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**270 THE INFLUENCE OF BMI ON CHRONIC INJURIES AND PERFORMANCE IN CLIMBING**

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**Background**
Climbing as a weight bearing sport is thought to rely on relative force (force/weight) ratio for performance. As a climber’s most valuable tool is the finger flexors, higher BMI is assumed to influence injuries. There is no previous analysis of the influence of BMI on chronic injuries and performance in climbing.

**Objective**
Assess possible associations of BMI on level of performance and injuries in climbing.

**Design**
Retrospective survey.

**Setting**
Item driven web-based questionnaire.

**Patients (or Participants)**
667 active climbers.

**Interventions (or Assessment of Risk Factors)**
Descriptive statistics, general linear model (GLM) (SPSS V25 for windows).

**Main Outcome Measurements**
Gender, age, BMI, level of performance, chronic injury past 6 months.

**Results**
481 male, 186 female, 58.7% were 26–40 years of age, mean BMI 22.78 (male 22.81 (SD 2.30), female 22.71 (SD 2.21), 76% intermediate or experienced climbers, 385 reported having chronic injuries. No associations were found for gender (p=.336), level of performance (p=.840), chronic injury (p=.447) or BMI.

**Conclusions**
The results from this study suggest that BMI does not influence onset of climbing-related chronic injury or level of performance in climbing.

**Clinical relevance**
The findings in this study suggest that there is no need for underreating to maintain a low BMI to be able to reach elite levels in climbing or to avoid injuries. It seems that muscular growth is according to the resistance in weight bearing sports as well as other sports.