

prevention practices addressing the aetiology and risk factors associated with the highest burden health problems in short-course triathletes. Developing a greater understanding of injury severity in short-course triathletes is required to determine injury severity and inform injury prevention programs.

#### Impact and application to the field:

- Overuse, lower limb injuries that mainly occurred due to running; and gastrointestinal and cardiovascular illnesses, mainly attributable to environmental factors, were the most frequently reported health problems in short-course triathletes.
- Identifying triathlon-specific injury mechanisms, activities and risk factors is critical for prioritisation of targeted prevention programs.

#### Conflict of interest statement

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

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#### Injury epidemiology in elite triathletes: A 4 year prospective study

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**Introduction:** To investigate the prevalence, incidence rate (IR) and burden of injuries in elite Australian triathletes over four years of training and competition to assist the identification of future prevention priorities.

**Methods:** Fifty triathletes (25 females and 25 males, mean age: 24 years  $\pm$  3.5) of the Australian national elite squad were prospectively followed for four seasons (2018-2021). Injuries requiring medical attention were prospectively recorded in a centralised database and were further sub-categorised as time-loss or non-time loss injuries. The IR and burden were calculated per 365 athlete-days, with differences in IR between males and females compared using incidence rate ratios (IRR) generated from negative binomial regression modelling.

**Results:** A total of 266 injuries were reported in 46 athletes, with 61.3% injuries resulting in a period of time-loss. The overall IR was 1.87 (95%CI=1.7-2.8) injuries per 365 athlete-days, and comparable between females (2.1, 95%CI=1.8-2.4) and males (1.7, 95%CI=1.4-2.0) (IRR= 0.82, 95%CI=0.7-1.0,  $p=0.10$ ). Overall athlete availability was 83.8% (95%CI=83.5-84.0).

The injury sites were comparable between females and males, with injuries most frequently reported at the ankle (15.8%), foot (12.4%), and lower leg (12.0%). Foot injuries accumulated the highest number of days missed from sport (2337 days). Pelvis/buttock (75 days, IQR 6-204) and foot (60, IQR 20-152) injuries had the highest median days of time loss per injury.

The most frequently reported tissue type injury was muscle ( $n=48$ , 18.0%) and tendon ( $n=46$ , 17.3%) injuries. There were twenty-five bone stress injuries reported, which resulted in the highest number of total days missed from sport (4456 days) of all tissue types. Bone stress injuries resulted in the highest number of median days lost (160 days, IQR 121-208). Females had a 2.7 times

higher rate of bone stress injuries compared to males (IRR=2.7, 95% CI=1.1-6.4,  $p=0.03$ ).

The injury burden was 68.5 days time-loss per 365 days (95% CI=58.8-80.0), with bone stress injuries accounting for almost half of the overall injury burden (32.1 days time-loss per 365 days, 95% CI=21.7-47.5).

**Discussion:** The majority of medical attention injuries reported in elite triathletes resulted in time-loss. Foot, ankle and lower limb injuries had the highest incidence, however pelvis/buttock and foot injuries were more severe, resulting in the highest number of training and competition days missed. The overall injury rate experienced by male and female triathletes was comparable, however, females demonstrated a significantly higher rate of bone stress injuries compared to male triathletes. Whilst there was a higher incidence of muscle and tendon injuries, bone stress injuries were far more severe than any other injured tissue and had the highest injury burden.

#### Impact and application to the field:

- Bone stress injuries were associated with the highest injury burden.
- The higher rate of bone stress injuries in female triathletes warrants consideration for specific selective prevention strategies.

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#### Functional outcome measures reported in longitudinal studies of ACL injury: a scoping review

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**Introduction:** The incidence of Anterior cruciate ligament (ACL) injury continues to increase each year. Many tools have been developed and validated to specifically measure function after an ACL injury. However, variability in these tools makes it difficult to compare and pool the results across different studies, potentially impacting on the quality of the evidence available to patients, clinicians, and policy makers. The aim of this scoping review was to summarize the different functional outcome measures and study characteristics in longitudinal studies of people following ACL injury.

**Methods:** Four electronic databases were searched: Medline, EMBASE, SPORTDiscus and CINAHL, from inception to October 2020. This review included longitudinal studies (with at least three months between at least two timepoints) published in any language, that reported any measure of function following an ACL injury that was managed either surgically or conservatively. Two independent reviewers screened titles/abstracts and the full text of potentially eligible studies. Data extraction was completed using a piloted data extraction sheet by two reviewers, with agreement determined by a third reviewer.

**Results:** The included studies ( $n=265$ ) had a combined sample of 106,449 participants, of which 62,085 (58%) were male and 44,364 (42%) were female. Participants' mean age was 27.5 years and a total of 17 different self-reported functional outcome measures reported. The International Knee Documentation Committee (IKDC) was the most frequently reported functional measure ( $n=141$ , 53%), followed by Lysholm ( $n=106$ , 40%), Tegner ( $n=80$ , 30%) and Knee Injury and Osteoarthritis Outcome Score (KOOS) ( $n=58$ , 22%), with the IKDC and KOOS becoming increasingly more common over the

last three decades. Most of the included studies (n=196, 74%) presented a follow-up duration of at least 2 years (range 6 months to 27 years). The proportion of male to female participants increased by 10% over the last three decades- 1990s (32%) to 2010s (42%).

**Conclusion:** This review revealed that IKDC, Lysholm, Tegner and KOOS were the most frequent measures of function in longitudinal ACL studies. Although most studies reported a follow-up duration of longer than 2 years, almost a quarter had a follow-up duration of less than 1 year. Despite the proportion of female participants in the included studies increasing over the last 30 years, more male than female participants continue to be included in longitudinal ACL studies.

**Impact/Application to the field:** The results of this study can guide clinicians and researchers towards outcome measures more frequently used in longitudinal studies following ACL injury to aid in the standardisation of ACL research and further inform the effectiveness of treatment following this debilitating but common injury.

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### **Barefoot running (BFR): Revisiting an old trend**

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**Introduction:** Despite the technological developments in modern running footwear, up to 79% of runners today get injured in a given year. Running barefoot is not a new concept; yet relatively few people choose to run barefoot (BF) on a regular basis. While benefits have been suggested, there are potential risks associated with running BF. The purpose of this presentation is to identify and summarize the up-to-date evidence-based knowledge concerning barefoot/minimal footwear running and their implications.

**Methods:** A literature search of MEDLINE, PEDro, EMBASE and the Cochrane data base CINAHL (from their inception – May 2022) was conducted using the following search terms: "barefoot running" and "barefoot running biomechanics".

**Results:** 84 relevant articles were found. Most were reviews, biomechanical and kinematic studies.

**Conclusion:** The studies that have looked at the barefoot condition have found notable differences in gait and other parameters. These findings, along with much anecdotal information, can lead one to extrapolate that barefoot runners should have fewer injuries, better performance, or both. Several athletic shoe companies have designed running shoes that attempt to mimic the barefoot condition and, thus, garner the purported benefits of barefoot running. Although there is no evidence that neither confirms nor refutes improved performance and reduced injuries in barefoot runners.

#### **Impact:**

- Many of the claimed disadvantages to barefoot running are not supported by the literature.
- barefoot running may be an acceptable training method for athletes and coaches who understand and can minimize the risks.

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### **Kinesiotaping (KT) in musculoskeletal conditions: the myths and facts**

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**Introduction:** The use of the kinematic tape (KT) has become common in recent years in the treatment of skeletal injuries for the purposes of: pain reduction, increased range of motion, improved joint stability and more. Few studies have been written on the subject, and opinions differ as to the efficacy of KT compared with other interventions in physiotherapy

**Purpose:** Review the evidence and validity of KT tape being an efficient method of physiotherapy compared to other interventions.

**Methods:** A literature search of MEDLINE, PEDro, EMBASE and the Cochrane data base CINAHL (from their inception –May 2022) was conducted using the following search terms "kinesiotape", "musculoskeletal"

**Results:** 112 reviews and articles were found, of which 47 relevant studies were included in this review. Results were divided according to body regions.

**Conclusion:** KT is a treatment method whose effectiveness is questionable in the treatment of skeletal injuries. There is partial evidence of short-term pain relief, improved flexibility and improved muscle electrical activity. The KT is part of a wide range of treatments for skeletal injuries and should be carefully and specifically applied for treatment.

#### **Impact:**

- It is not possible at this stage to recommend the wide use of KT in musculo-skeletal conditions
- KT has no better effect than any placebo tape in the treatment of musculo-skeletal conditions

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### **Referent weight-bearing values and distribution patterns in walking, ground, treadmill and elliptical jogging: An original research study**

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**Introduction:** Sports physicians are frequently required to decide on patient weight-bearing limitations following certain bony or soft tissue injuries as well as lower-limb surgical procedures. The purpose of this presentation is to provide researched data regarding the average percentage body weight (APBW) values and weight-bearing distribution patterns (WBDP) between four common leisure and sports activities in a referent adult population and to suggest clinical implications.

**Methods:** An innovative weight-bearing system gait analysis system (SmartStep™) was utilized in this study. Asymptomatic