An ounce of prevention is better than a pound of cure: Shouldn't we be doing EVERYTHING to reduce sports injury incidence and burden?

Corresponding and lead author: Dr Adam Gledhill

Carnegie School of Sport, Leeds Beckett University, Leeds, UK

E-mail: adam.gledhill@leedsbeckett.ac.uk

Twitter: @gleds13

Second author: Dale Forsdyke

School of Sport, York St John University, Lord Mayors Walk, York, UK YO31 7EX

E-mail: d.forsdyke@yorksj.ac.uk

Twitter: @forsdyke_dale

Given the impact of sports injury on athlete health, wellbeing and performance, reducing the incidence and burden of injuries is a priority for clinicians.[1] As the causes of sports injuries are multifactorial , it is incumbent upon multidisciplinary teams to design injury prevention programmes which address and modify these different factors [1,2]. Despite this, it is uncommon that psychological components are included as part of injury prevention programmes. This is often, in part, attributed to a lack of confidence in integrating psychological techniques into programmes, concerns over the quality of evidence-base, or stigmas attached to the roles of sport psychology in sport [3]. Consequently, the aims of this editorial are to first make a rationale for the inclusion of sport psychology interventions within injury prevention programmes and secondly suggest types of interventions that could be included as part of a multidisciplinary injury prevention programme.

Why should I invest in psychological interventions?

Psychosocial characteristics are associated with an increased risk of injury and/or increased injury time-loss, with the link between psychosocial stress, stress responses and injury risk perhaps the most widely cited and recognised.[4] The potential mechanisms behind these include psychophysiological, neurocognitive and/or behavioural changes which may increase the risk of acute or overuse injuries. This being said, the link with overuse injuries is currently less established. [4,5] Each of these potential mechanisms can be altered through the appropriate use of psychological intervention [4,5].

Which psychological interventions 'work'?

In short, there has yet to be a study which shows that psychological interventions are ineffective at reducing sports injury rates or injury time-loss.[4,5] Most frequently, cognitive behavioural approaches report clinically meaningful effect sizes on injury incidence, with long-term effects being evident even in time-efficient interventions (e.g. short duration, low frequency).[4,5] However, to demonstrate the range of findings within this body of research,

it is noteworthy to consider the breadth of interventions investigated. In a randomised clinical trial reporting a large effect size, [6] Cognitive Behavioural Stress Management reduced the number of days missed from illness and injury in competitive athletes with reductions in serum cortisol levels strongly associated with fewer days missed. The Mindfulness Acceptance and Commitment approach demonstrated moderate effects on reducing injury rates.[7] Further, using video-based awareness training has shown small reductions in match-related injuries, but results with training injuries have been less promising.[8] Ostensibly, utilising an intervention which targets any key injury risk factor of chronic and/or elevated negative psychosocial stress, attentional deficits, or unsafe risk-taking behaviours, may reduce injury incidence and burden [4,5]. It is incumbent upon sports medicine and sport psychology practitioners to work collaboratively in a multidisciplinary manner to ensure that the body of research continues to grow the number of large-scale RCTs upon which practice can be based.[5]

Box 1: Examples of intervention techniques and their potential injury reduction benefits

Cognitive Behavioural Stress Management (incorporating relaxation, diaphragmatic breathing, imagery and cognitive restructuring): Can help to reappraise stressful situations as challenges as opposed to threats, manage emotional responses to situations, and have residual impacts on behavioural adherence. Collectively, these may impact on rates of traumatic and overuse injuries.

Progressive Muscular Relaxation: Potentially decreases the risk of overuse by decreasing muscle tension and increasing rate of recovery

Combined imagery and positive self-talk: Used to help athletes view themselves peaking under pressure, coping with adversity, increasing confidence and concentrating on appropriate environmental cues. This may help to reduce stress responsivity and alter neurocognitive functioning which influences decision making, risk taking behaviours and may reduce the risk of traumatic injuries as a result.

Mindfulness-Acceptance and Commitment: Paying attention to the present moment can improve attentional processes, thus reducing attention disruption and distractions. Attention disruption and distractions are two injury risk factors; consequently, modifying these may reduce injury risk.

How do I decide which to use?

The intervention decision should be based on an appropriate needs analysis. This may be in the form of wellness screening for athletes and teams in post-season and pre-season within a team's standard operating plan as part of multidisciplinary care, or on an individual basis. Most commonly, this screening is in the form of self-report measures. Box 2 provides examples of screening tools used in published literature examining psychosocial risk factors in sports injury.

As with many types of intervention, psychological interventions tend to be more effective in instances where athletes are higher risk. [4] Routinely screening athletes may help to identify this risk and provide the basis of an intervention or referral to an appropriate member of the multidisciplinary team. As negative life event stress and hassles report strong associations with injury occurrence [4], these become noteworthy considerations for practitioners. It is important to remember that needs analyses, psychological screening and delivering psychological interventions may need to be completed by an appropriately qualified sport psychology professional and appropriate referrals may be needed (see Box 3 for potential organisations).

Box 2: Examples of screening tools used within the psychology of sports injury literature

Measures of psychosocial stressors and history of stressors

- Life Events Survey for Collegiate Athletes. Available from: https://www.tandfonline.com/doi/abs/10.1080/08964289.1992.9936963
- Perceived Stress Scale. Available from: http://www.mindgarden.com/documents/PerceivedStressScale.pdf
- Hassles and Uplifts Scale. Available from: http://psycnet.apa.org/doiLanding?doi=10.1037%2F0022-3514.54.3.486

Measure of sport anxiety

- Sport Anxiety Scale. Available from: https://www.tandfonline.com/doi/abs/10.1080/08917779008248733

Measures of coping

- Brief Cope. Available from: http://www.psy.miami.edu/faculty/ccarver/sclBrCOPE.html

Box 3: Examples of professional sports psychology associations

- American Psychological Association (APA): http://www.apa.org/
- Association for Applied Sport Psychology (AASP): http://www.appliedsportpsych.org/
- Australian Psychological Society (APS): http://www.psychology.org.au/
- British Psychological Society (BPS): http://www.bps.org.uk/
- British Association of Sport and Exercise Sciences (BASES): http://www.bases.org.uk/
- North American Society for the Psychology of Sport and Physical Activity (NASPSPA): https://naspspa.com/

Conclusions

The evidence-base in this important area of sports injury prevention is ever growing and presents a pattern of largely consistent, clinically meaningful results. [4,5] Psychosocial factors such as stress, stress responsivity and low coping resources are related to increased acute and overuse injury risk. Psychological intervention can improve each of these risk factors and, whilst the evidence suggests the effect sizes are sometimes small, we should keep in mind the words of Benjamin Franklin: 'An ounce of prevention is better than a pound of cure'.

1 Bahr R, Krosshaug T. Understanding injury mechanisms: A key component of preventing injuries in sport. *Br J Sports Med* 2005; 39: 324 – 329.

2 Meeuwisse WH. Assessing causation in sports injury: a multifactorial model. *Clin J Sport Med* 1994; 4: 166 – 170

3 Heaney C, Walker N, Green A, et al. Sport psychology education for sport injury rehabilitation professionals: A systematic review. *Phys Ther Sport* 2015; 16: 72 – 79.

4 Ivarsson A, Johnson, U Andersen, MB, et al. Psychosocial factors and sports injuries: A meta-analysis for prediction and prevention. *Sports Med* 2017; 47: 353 – 365.

5 Gledhill A, Forsdyke D, Murray, E. Psychological interventions used to reduce sports injuries: A systematic review of real-world effectiveness. *Br J Sports Med* Published Online first: 20 February 2018. Doi: 10.1136/bjsports-2017-097694

6 Perna F, Antoni M, Baum A, et al. Cognitive behavioural stress management effects on injury and illness among competitive athletes: A randomised clinical trial. *Ann Behav Med* 2003; 25: 66 – 73

7 Ivarsson A, Johnson U, Andersen M, et al. It pays to pay attention: A mindfulness-based program for injury prevention with soccer players. *J Appl Sport Psychol* 2015; 27: 319-334

8 Arnason A, Engebretson L, Bahr R. No effect of a video-based awareness program on the rate of soccer injuries. *Am J Sports Med* 2005; 33: 77 – 84.