

## Editorial

## Setting the bar: athletes and vulnerability to mental illness

Lynette Hughes and Gerard Leavey

**Summary**

Whereas physical sport activity is generally considered a health benefit, extreme exercise may be harmful. Of particular concern in this regard is the considerable variation between doctors in the primary care setting and those working within the sports setting around the diagnosis and treatment of athletes presenting with similar symptoms. Known risk factors for athletes are herein presented to raise awareness of the negative side of sport and to bring

attention to the psychological outcomes and needs of athletes. The need for research into the incidence and aetiology of mental illness within elite level sport is also raised.

**Declaration of interest**

None.

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The level of financial investment in the 2012 Summer Olympic Games, in London, is testament to its symbolic, cultural and financial importance as a national project. Sport is a major platform for encouraging the general population to become more physically active, a key element of health promotion strategies in high-income countries.<sup>1</sup> It is not hard to see why. Physical inactivity has been reported as the most prevalent chronic disease risk factor, costing the UK National Health Service an estimated £1.06 billion annually.<sup>2</sup> A dose–response relationship between physical activity and health benefit has been reported with physical activity found as more effective than no treatment, and as effective as traditional interventions such as cognitive therapy, antidepressant treatment and cognitive–behavioural therapy.<sup>3</sup> However, there is no consensus regarding the optimal amount and type of activity required to achieve such benefits.<sup>4</sup>

**Risk factors for athletes**

Although moderate or vigorous-intensity aerobic activity is important in the prevention of and recovery from mental and physical health problems, when performed more intensely at ‘professional/elite’ levels, physical activity can compromise health.<sup>1,5</sup> Beyond the national prestige, fame and glory of Olympic success lies the darker side of overexposure to elite sport such as overtraining, injury, burnout, increased risk for sudden cardiac death and other non-cardiovascular conditions such as respiratory symptoms, iron deficiency, increased incidence of allergies, immunological suppression and infection, gastrointestinal symptoms, diabetes mellitus and eating disorders.<sup>6</sup>

Athletes may also be vulnerable to mental illness for several reasons. First, the social world of many organised elite sports is one that requires investments of time and energy, often resulting in a loss of personal autonomy and disempowerment for athletes.<sup>7</sup> The elite-sport environment can result in ‘identity-foreclosure’

leaving athletes few other avenues through which to shape and reflect personality.<sup>7</sup> High athletic identity has been linked to psychological distress when this function of identity is removed, and to overtraining and athlete burnout.<sup>7</sup> The latter conditions strongly correlate with affective disorders such as major depressive disorder.<sup>5,7</sup> Moreover, injury, competitive failure, ageing, retirement from sport and other psychosocial stressors, precipitate depression in athletes.<sup>8</sup> In addition, the literature on elite sport indicates a range of other vulnerabilities such as disordered eating<sup>9</sup> and risk-taking behaviours among athletes such as hazardous drinking, driving while intoxicated and unprotected sex.<sup>10</sup>

The prevalence of overtraining in elite athletes has been reported at between 20 and 60%, with distance runners most severely affected.<sup>5</sup> Burnout, the most extreme end of the overtraining continuum, has been reported in approximately 10% of elite athletes.<sup>7</sup> Moreover, a recent review of eating disorders among those participating in high-intensity sports, reported a prevalence of 17.2% for males and 32% for females.<sup>9</sup> Other studies have reported eating disorders in women athletes to be as high as 60%, with athletes found to be in more severe stages of the disorder than controls.<sup>8</sup> Compounding this, the injury experience of an elite athlete has been likened to the grief process observed following bereavement, with an estimated 10–20% of athletes warranting clinical intervention, with suicide a cause of concern.<sup>11</sup> A dose–response relationship exists between physical activity and the likelihood of injury; again, with elite athletes at most risk.

The appendix summarises a growing body of evidence pointing to both the positive and negative health outcomes of elite sport. However, despite a number of high-profile breakdowns and tragedies among athletes there remains a tendency among sports governing bodies and officials to downplay or ignore the significance of psychiatric symptoms among this population.<sup>8</sup> Schwenk’s work indicates how the current approach to mental illness in athletes is ‘fraught with stigmatisation, denial, and dichotomous paradigms of “psychological” versus “physical” disease, which are inaccurate, unhelpful and deprive the athlete of effective care’.<sup>1</sup> This scenario is in no way helped by the unusual clinical environment whereby the traditional relationship between doctor and patient is distorted or absent. Doctors working within the sporting environment are frequently under intense pressure from management, coaches, trainers and agents to improve performance in the short term and are therefore faced with a myriad of ethical dilemmas that compromise the well-being and treatment of the athlete.<sup>12</sup>

## Appendix

## Positive and negative effects of elite sport on health outcomes

Adapted from Hamer *et al*,<sup>4</sup> Lisha & Sussman,<sup>10</sup> Walker *et al*,<sup>11</sup> Smith<sup>13</sup> and Maffulli *et al*<sup>14</sup>

## Positive effects

## Neurological

↑ neurological functioning (central norepinephrine neurotransmission, secretion of atrial natriuretic peptide, metabolism and beta-endorphins, availability of brain neurotransmitters dopamine, serotonin and noradrenaline, enhanced cognitive functioning and brain plasticity)  
Increases peripheral catecholamine plasma levels which are associated with learning and memory improvements  
Can reverse the effects of stress, depression and ageing on neurotrophic expression and neurogenesis in the brain

## Mental

↓ incidence of dysthemic (mood and chronic depressive) disorders  
Provides immediate psychological benefits (↑ mood, ↑ level of brain-derived neurotrophic factor acting just like a regular antidepressive drug)  
↓ emotional distress and anxiety  
Increased self-efficacy, mastery and self-concept

## Physical

↓ incidence of somatoform (physical symptoms of mental disorders)  
↓ risk of chronic disease and comorbid mental disorders, delaying the onset of neurodegenerative processes  
(↑ circulation of pro-inflammatory cytokines that is normally up-regulated during a stress response that over time can increase immune system threshold for stress)

## Negative effects

## Neurological

Overtraining: body's up-regulation of acute inflammation resulting in the production of elevated levels of cytokines and cortisol levels

## Mental

Psychological impact of injury (e.g. depression, low motivation, isolation, bereavement responses of denial and anger, loss of identity, loss of confidence, performance decrement)  
Disordered eating: anorexia nervosa, bulimia and body dysmorphia  
Burnout: ↓ mood and self-esteem, loss of confidence, exhaustion, depression/helplessness, withdrawal

## Physical

Injury incidence: resulting in limb deformities, leg length discrepancy, susceptibility to growth plate injury, limited thermoregulatory capacity and maturity associated variation in young elite performers; increased risk of developing osteoarthritis and spine pathologies in former athletes  
Overtraining: altered immune function including susceptibility to colds, flu and infection, gastrointestinal disturbances, headaches and muscle aches<sup>13</sup>  
Athlete burnout – physical exhaustion, reduced performance accomplishment and sporting devaluation that serves to compromise future physical activity involvement. Symptoms include disrupted sleep, ↑ muscle soreness, chronic fatigue, ↑ incidence of injury/illness, and ↓ aerobic power  
Risk-taking behaviours of sports people (e.g. hazardous drinking, driving while intoxicated, having unprotected sex and antisocial behaviour)  
Increased risk for sudden cardiac death, respiratory symptoms, iron deficiency, increased incidence of allergies, immunological suppression and infection, gastrointestinal symptoms, diabetes mellitus

## Conclusions

Given the range of mental disorders and stresses inherent in elite sports there is a need to balance the message around the benefits of physical activity. Limited research exists within mainstream mental health literature and within the sporting community on the mental health and well-being of elite athletes. It would be remiss for sporting governing bodies and the UK government to assume athletic immunity to mental health disorders. Tackling obesity is an important public health activity but it is also the case that we require better understanding of the psychological needs of athletes during their career and once it is over. Currently there is little understanding of the diagnostic and therapeutic issues unique to the sporting population.<sup>8</sup> More research is needed on the incidence and aetiology of mental illness within elite-level sport, which would serve to inform those working with athletes. Importantly, the inclusion of competitive athletes in mainstream mental health research will help establish a comprehensive continuum of well-being that would shape and inform physical activity guidelines that are reflective of the entire population and its mental health needs.

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First received 21 Apr 2011, final revision 29 Jul 2011, accepted 15 Sep 2011

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The British Journal of Psychiatry

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*BJP* 2012, 200:95-96.

Access the most recent version at DOI: [10.1192/bjp.bp.111.095976](https://doi.org/10.1192/bjp.bp.111.095976)

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