Psychological Response to Injury and Illness

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Introduction

Participation in sport entails hours of training, practice, and competition with athletes spending time and energy working with coaches and other support staff to improve their skills and compete. Mental health (MH) is an important consideration in supporting the overall vigor and well-being of athletes. Several recent publications have focused on MH symptoms and disorders in athletes [1–5]. MH and well-being exist on a continuum, with resilience and thriving on one end and MH symptoms and disorders that significantly disrupt function and performance on the other. A systematic review and meta-analysis of 22 studies demonstrated a prevalence of MH symptoms and disorders in current and former elite athletes in males and females from team sports and combined Olympic sports that was significant, with the most common symptoms and disorders reported being anxiety, depression, sleep dysfunction, alcohol misuse, and general psychological distress [6].

Participation in sport includes the additional risk of injury and illness that may not necessarily be experienced by nonathletes. There is an interface between injury or illness and MH and performance that is quite complex, and understanding the risk factors for injury and/or illness is complicated [1–3, 5, 7, 8]. It is unclear whether participation in sport increases the risk of or potentially protects athletes from MH disorders. Sport entails unique stressors, and, accordingly, there are MH symptoms or disorders in athletes that are potentially seen more commonly than in their nonathlete peers. These stressors include sexual abuse, hazing and bullying, challenges related to retirement from or transition out of sport, and the psychological response to injury and illness [1, 2]. This chapter will focus on the psychological response to injury and illness.

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Epidemiology

As mentioned previously, in a systematic review of elite sport athletes, several MH symptoms and disorders were reported in both current and former elite male and female athletes [6]. The prevalence ranged from 19% for alcohol misuse to 34% for anxiety/depression in current elite athletes and from 16% for distress to 26% for anxiety/depression in former elite athletes.

Specifically, for current athletes, in 11 studies of 3335 male and female athletes, 19.6% (95% confidence interval (CI): 16.0–23.0) reported symptoms of distress. In 10 studies of 4782 current athletes from various sports, 26.4% (95% CI: 21.6–31.2) reported symptoms of sleep disturbance. In 9 studies of 2895 current athletes from various sports, 33.6% (95% CI: 27.4–39.7) reported symptoms of anxiety/depression. In 11 studies of 5555 current athletes from various sports, 18.8% (95% CI: 11.1–26.5) reported symptoms of alcohol misuse. Cross-sectional studies demonstrated eating disorders (EDs)/disordered eating (n = 7 studies) in 1–28%, panic disorder (n = 2 studies) in 1–5%, and problem gambling (n = 1 study) in 2–7% [6].

Specifically, for former athletes, 15 studies were included, and prevalence data from 8 of them (n = 1686 male and female athletes from team sports and combined Olympic sports) demonstrated that 15.8% (95% CI: 16.0–23.3) reported symptoms of distress [6]. Sleep disturbance was reported in 20.9% (95% CI: 15.2–26.6) out of a total of 1579 former athletes (n = 7 studies) from various sports. Anxiety/depression was reported in 26.4% (95% CI: 21.4–31.4) out of a total of 1662 former athletes from various sports (n = 8 studies). Alcohol misuse was reported in 21.1% (95% CI: 14.7–27.4) out of a total of 1636 former athletes from various sports (n = 8 studies). Cross-sectional studies revealed eating disorders in 24–27% (n = 2 studies), dementia in 6% (n = 1 study), Alzheimer's disease in 12% (n = 1 study), and mild cognitive impairment in 23% (n = 1 study). This comprehensive review demonstrates the significant prevalence of MH symptoms and disorders in both current and former

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male and female elite athletes participating in a variety of sports [6].

The Context and Current Environment of Mental Health, Injury, and Illness in Elite Sport

The International Olympic Committee (IOC) has identified MH as a focus point, with the development of several new tools for athletes and several other stakeholders related to MH and wellness, including the Sports Mental Health Recognition Tool 1 and the Sports Mental Health Assessment Tool 1 as well as the IOC Mental Health Toolkit [9–11]. These tools have raised awareness, provided education to several stakeholders, and created a framework to understand important policies and procedures that can improve the delivery of MH care to athletes.

There are several barriers and facilitators to help-seeking behavior in athletes [11–13], and prevention programs should address these through education, policy development, mental health action plans, screening programs, and effective referral and treatment plans. The most important barriers to help-seeking behaviors in elite athletes are MH stigma, a lack of MH literacy, and the negative experience that some athletes had previously had when seeking help [11, 12]. Alternatively, facilitators to help-seeking behavior include encouragement from others, an established relationship with the health-care provider, positive previous interactions with the provider, support for help-seeking by others, especially coaches, and access to the Internet [11, 12].

Health-care providers can be instrumental in facilitating help-seeking behavior by providing educational programs, developing and implementing policies and programs, adding screenings for MH symptoms and disorders to sports physicals and office visits as indicated, and establishing MH plans and MH Emergency Action Plans. Given the relationship that many team physicians develop with athletes and teams, the ability to decrease the stigma surrounding MH is an important opportunity for improving the overall health and safety of athletes [1]. In addition, team physicians and other health-care providers that work with athletes are often involved throughout the injury/illness and are therefore in a position to recognize athletes that may be in distress related to their injury/illness [1–4].

Illness and Injury in Elite Athletes

Illness and injury have been associated with and identified as risk factors for several MH symptoms and disorders that occur commonly in athletes, including anxiety, depression, suicide, substance use, disordered gambling, trauma-related disorders, overtraining, and eating disorders (EDs) as well as issues related to transition/retirement from sport [5, 14–26]. Although controversial, there may, conversely, also be MH disorders and psychological stressors that an athlete experiences that can increase the risk of illness or injury [27–31]. Finally, there may be underlying MH disorders that are unmasked by the psychological response to injury or that complicate recovery from injury [27–29, 31–35].

The risk factors for injuries are multifactorial and often challenging to interpret. Injured athletes report a higher level of symptoms of both depression and anxiety compared to their noninjured peers [26, 36]. The risk factors for injury include both sociocultural and psychological factors [31, 37, 38]. The sociocultural risk factors include social pressures, limited social resources, a lifetime history of sexual or physical abuse, organizational stress (i.e., how the athlete feels about the structure and function of their team), stress related to a negative self-assessment of their academic or athletic performance, coaching quality (how they perceive their relationship with their coach), and the culture of their sport/team (e.g., the mindset of the team; win at all costs versus continued team growth) [3, 31, 39, 40]. The psychological risk factors include perfectionism, anxiety/worry, hypervigilance, poor body image or low self-esteem, limited coping resources, risk-taking behaviors, low mood state, or life event stress (e.g., stress associated with major life event stressors such as the death of a family member or starting at a new school). Life event stress can also include athlete-specific stressors such as injury or illness, fear of reinjury, failure in competitions, retirement from sport, or abuse related to sport (e.g., sexual abuse, hazing, bullying) [27–30, 33, 41].

Although there are limited prospective and/or conflicting results regarding the risk factors related to injury, life event stress and high stress response (e.g., negative emotional response after a sport injury or other stressful events) consistently demonstrate a relationship with injury risk [26, 29, 31, 37, 39, 40, 42–44]. Athletes with higher resiliency and "mental toughness" have lower rates of injury and lower rates of depression, stress, anxiety, and obsessive-compulsive symptoms [17, 21].

The psychological response to injury has been described previously as a model that suggested that the way an athlete appreciates their injury (cognitive appraisal) determines their emotional and behavioral responses [38]. This has formed the framework for much of the more recent literature. The cognitive, emotional, and behavioral responses can be influenced by several athlete-specific factors, can change over time, and can influence the rehabilitative process as well as an athlete's ability to return to sport. Understanding each of these responses is critical in understanding how they interact and what role the medical staff can play in providing additional support and improving outcome.

A cognitive response is how the athlete understands their injury or illness. It leads to an emotional response; both can be either "normal" or "problematic," [3] and both can affect behavioral responses such as goal setting, motivation, and compliance with treatment [37]. An emotional response is how the athlete feels about their injury or illness. This can include sadness, anger, frustration, changes in sleep or appetite, and lack of motivation [37].

Improved injury recovery has been shown in athletes that have more positive cognitive, emotional, and behavioral responses to injury [17, 27, 45–50]. Factors such as motivation [51], apprehension of reinjury [41, 52–54], and psychological readiness [55] are associated with a higher likelihood of return to the preinjury level of play and higher post-injury performances [50]. Higher levels of optimism and self-efficacy and lower levels of depression and stress are also associated with improved recovery from injury [17, 27, 46, 48–50, 54, 56–60].

Management of Injuries and Illnesses to Improve Outcomes

Strategies such as (1) using modeling techniques (e.g., videos, peer athletes) to decrease the fear of reinjury, (2) support of athlete autonomy (e.g., via explaining the purpose of rehabilitative exercises), (3) increasing confidence (e.g., via goal setting, functional tests), (4) providing social support, (5) finding a role for the athlete within their sport (e.g., monitoring statistics, helping the coach), and (6) stress inoculation training (e.g., to avoid the need for pain medication if the injury requires surgery) are all important for improving recovery [47, 60].

A recent publication has outlined a 24-week program via a randomized controlled trial (RCT) for athletes recovering from anterior cruciate ligament (ACL) surgical reconstruction. It plans to implement cognitive behavioral therapy modules targeting several psychological barriers to return to sport as an intervention [61]. The seven self-directed modules are provided using a smartphone application and address: (1) goal setting, (2) recovery, (3) return to sport, (4) return to performance, (5) staying injury-free, (6) handling thoughts and emotions, and (7) injury education [61]. The results of this RCT will be useful in determining whether a smartphone application that delivers cognitive behavioral therapy is effective in improving the number of athletes that return to various levels of sport after surgical treatment of their ACL injury.

Specific Situation: Sport-Related Concussion (SRC)

One of the most common injuries that is particularly challenging is a sport-related concussion (SRC) [62], which includes several nonspecific symptoms that are the same symptoms endorsed by individuals with MH disorders. This overlap creates diagnostic challenges for health-care providers working to both diagnose and treat SRCs [63–65]. There are also data that suggest that athletes with SRC may develop MH symptoms and that athletes may use substances in order to cope with these emotions [66]. A prospective cohort study of male professional rugby players assessed at three time points (a baseline assessment and then follow-ups at 6 and 12 months) found that those players that sustained a concussion within 12 months of a baseline assessment were more likely to develop MH symptoms (odds ratio ranging from 1.5 (95% CI: 1.0–2.1) for distress to 2.0 (95% CI: 1.2–3.6) for adverse alcohol use). In this study, players who sustained a severe injury within 12 months of baseline were more likely to develop symptoms of anxiety/depression (odds ratio of 1.5 (95% CI: 1.1–2.0)) [67].

In male collegiate athletes who have been diagnosed with SRC, symptoms of depression, anxiety, and impulsivity are commonly noted [68]. In one study, 20% of collegiate athletes reported symptoms of depression after an SRC, with predictors including ethnicity (non-White), baseline reporting of symptoms of depression, the number of games missed after injury (the more the games, the more are the symptoms), and the number of years they had been involved in sport (more symptoms if fewer number of years in sport) [65]. A longer recovery time and/or persisting symptoms after an SRC, a preexisting history of mood or other MH disorders, a family history of MH disorders, and high-stress life events have been associated with the development of MH symptoms [16, 19, 69–72]. Individuals who have had an SRC report fear of reinjury [32, 67], an issue initially cited in athletes after ACL reconstruction [17, 46, 48, 49, 56, 73].

Other Injuries and Illnesses: Beyond Concussion

Whether the psychological response is different when in response to a musculoskeletal injury versus other types of injuries or illnesses such as concussion is unclear. The assumption might be that the response might be similar if the expectation (how severe the athlete appreciates the condition to be) is similar. A recent study has found that the response to a musculoskeletal injury and a concussion are similar when assessed using the Profile of Mood States (POMS) and the State-Trait Anxiety Inventory (STAI) [74]. The time to return to sport was similar, and this was an important consideration. In addition, there was improvement over time for both conditions, suggesting that psychological issues that occurred after an injury, whether musculoskeletal or a concussion, improved to baseline levels of function no matter the injury [74].

Another recent study has evaluated whether or not the premorbid psychological status of the athlete can predict how they handle a subsequent injury/illness and found that if

the athlete had some previous experience with adversity, which was neither trivial nor overwhelming, then they did better than others with either nonexistent adversity or prior overwhelming adversity [75]. In this study, the authors prospectively evaluated preinjury adversity over a 5-year time period using a measure of adversity and then evaluated a measure of coping as well as psychological responses at the onset of injury, rehabilitation, and return to sport. They subsequently performed in-person interviews on a subset of the injured participants. They theorized that an explanation for their findings was that athletes with high preinjury adversities were excessively overwhelmed such that they were unable to cope with injury and those with low preinjury adversities had not developed coping abilities and lacked the resources needed to cope with injury [75]. More research is needed to further clarify future directions.

The human severe acute respiratory syndrome (SARS) coronavirus called COVID-19 [76] was first described in December 2019 and subsequently created a worldwide pandemic. It brought elite sports to a halt and postponed the Summer Olympic Games, moving them to Tokyo in the summer of 2021. The literature regarding the impacts of COVID-19 suggests the psychological effects of the pandemic on athletes [77–79]. At the collegiate level, a survey of >37,000 athletes demonstrated high rates of mental distress, with more than 25% reporting feeling sadness and a sense of loss and 8.3% reporting "feeling so depressed it has been hard to function" at least "constantly" or "most every day" [77]. Sleep dysfunction was reported in one in three (33%), and 80% reported having barriers to training including fear of exposure to COVID-19 (43%), lack of motivation (40%), feeling of stress or anxiety (21%), and sadness or depression (13%) [77]. It is clear that the mental health response to COVID-19 infection is significant not only for athletes but also for the general population at large, and ongoing efforts to recognize and identify athletes at risk for mental health symptoms and disorders are essential [78].

Future Directions

Over the past decade, more attention has been paid to the importance of psychological factors and how they relate to not only the risk of injury/illness but also how these factors may relate to recovery, rehabilitation, and return to sport [80]. MH issues are common in sport [1–6], and a better understanding of the importance of recovery [81], nutrition, and sleep [82] in supporting overall well-being and performance is expected [83].

More attention is being paid to the evaluation of psychological factors, unique stressors, and risk factors for injury—including psychological parameters—[84] and ultimately a better understanding of the psychological response to injury and how to respond and support athletes that are injured or ill will be possible. Understanding the complexity that each individual athlete presents with their antecedent psychological factors, the social support network that they have in place, their prior adversity, and all the factors that can play a role in modifying their post-injury/illness response is an area of further research. Having a better understanding of the cognitive, emotional, and behavioral responses to injury, as well as the individual factors that can affect them, is also an area that merits additional attention.

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