The association among injury, performance, and mental health (MH) in elite athletes is complicated.[1-6] Psychsocial factors may be risk factors of injury/illness[4, 6-18, 21], injury/illness may unmask or trigger MH symptoms/disorders,[16, 19] and MH symptoms/disorders can prolong recovery from injury.[10,12-15,20] Anxiety/worry, hypervigilance, anger/hostility, lack of attention, indecision, poor body image, low self-esteem, perfectionism, limited coping resources, risk-taking behaviors, and low mood state are risk factors for injury.[6-10] Life event stress, limited social resources, a lifetime history of sexual or physical abuse,[22] social pressures, organizational stress,[23] stress related to negative self-appraisal of athletic and academic performance, coaching quality, and the culture of sport/teams are sociocultural risk factors.[7,16,24-25]

In a meta-analysis, a high stress response and history of life event stressors had the strongest associations with injury rates.[12] These stressors can cause distraction, inattention, and increased self-consciousness while impairing coordination and increasing muscle tension, which can impede performance and increase injury risk. [12,21,24-30] One study demonstrated an increase in injuries when teammates and coaches are the sources of stress.[25] Involuntary and overly intense emotional reactions is also associated with injury.[10,31-32]

In response to injury, any combination of cognitive, emotional and behavioral responses can occur and can be unique. Cognitive responses include concerns about re-injury, doubts about competency, low self-efficacy, loss of identity and concerns about medical staff competency.[33-36] Emotional responses include sadness/crying, depression, suicidal ideation, anxiety, isolation, lack of motivation, irritability/anger, changes in appetite and sleep, low vigor, disengagement, and burnout.[4,19,37-39] Emotional responses are “normal”, but can be “problematic” when 1) they do not resolve, 2) they worsen over time, or 3) when the symptoms seem disproportionate to injury severity.[7] Finally, injury, and possibly illness, may trigger or unmask behavioral responses, including aggressive behavior and

social withdrawal, and/or MH disorders such as disordered gambling, disordered eating or eating disorders, and substance use disorders.[40-56]

Persisting MH symptoms following injury can prolong injury recovery[6-7,14] Improved recovery has been demonstrated in athletes with more positive cognitive, emotional, and behavioral responses.[13,33,57-67] Improved recovery has been associated with higher levels of optimism, motivation, resilience, and self-efficacy and lower levels of depression and stress. [6,13,57-67] Higher psychological readiness and pain self-efficacy scores and lower kinesiophobia and pain catastrophizing scores has been associated with enhanced recovery.[68-69]

Psychological readiness after injury can be assessed and is an important component of the RTS decision (Table 1).[60,69-72,74-81] Interventions that might enhance RTS include: (a) modeling techniques to reduce re-injury anxiety;[69] (b) foster athlete autonomy; (c) functional tests and goal setting to build confidence and self-efficacy; (d) provide social support; (e) avoid premature RTS yet keep athletes in their sport; (f) stress inoculation training when surgery is required; [33,66,73] and (g) screen for MH symptoms and psychosocial barriers.[69]

Table 1. Select screening tools for psychological readiness for RTS after injury

Screening Tool	**Description of What the Tool Measures**
Sport Mental Health Assessment Tool 2 (SMHAT-2) [74]	Mental health symptoms/disorders in elite athletes
Tampa Scale-11 for Kinesiophobia[75,76]	Pain-related fear of movement.
Re-Injury Anxiety Inventory (RIAI)[77]	Re-injury anxiety
Injury-Psychological Readiness to Return to Sport Questionnaire (i-PRRS)[60,78]	Psychological readiness of an injured athletes to RTS
Psychological Readiness of Injuried Athlete to Return to Sport Quesionnaire (PRIA-RS)[79-80]	Psychological readiness of an injured athlete to RTS
Fear Avoidance Belies Questionnaire (FABQ)[81]	Fear avoidance beliefs about physical activity and how they contribute to low back pain and disability
ACL-Return to Sport After Injury Inventory (ACL-RSI)[82]	Psychological readiness to RTS participation after anterior cruciate ligament reconstruction
Pain Self-Efficacy Questionnaire [83]	Confidence to complete tasks despite pain

Pain Catastrophizing Scale[84]	Negative or exaggerated response to actual or perceived pain

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