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Depression and Other Mental Health Disorders Among Athletes with Injuries: Challenges in Diagnosis, Treatment, and Rehabilitation

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Abstract

Athletes are often praised for their physical resilience, but they are also vulnerable to mental health challenges, particularly following an injury. Musculoskeletal injuries, the most common type in sports, not only increase the risk of further harm but also impede recovery, contribute to depression or other mental health disorders, and adversely affect athletic performance. Emotional reactions such as sadness, isolation, anger, and a loss of motivation can exacerbate mental health issues. At the same time, psychological stress, fear of reinjury, and uncertainty about recovery timelines create a cycle of distress that hinders both physical and mental healing. Although emotional responses to injury are regular, prolonged or intense reactions can lead to more serious conditions, including depression, anxiety, eating disorders, or substance abuse. Given the critical link between mental health and recovery, it is essential to address the mental well-being of athletes during their rehabilitation process. Early intervention and psychological strategies are key in improving recovery outcomes and supporting overall mental health. However, many athletes face barriers to seeking help, such as stigma and lack of awareness. Practical strategies for supporting mental health during rehabilitation include mental health education, early screening, interpersonal therapy, cognitive-behavioral therapy, mindfulness practices, and visualization techniques. Integrating

these approaches into rehabilitation plans enables athletes better to manage the mental and physical challenges of recovery. A collaborative approach involving coaches, healthcare providers, and mental health professionals is essential to ensuring comprehensive support for athletes' well-being throughout rehabilitation. By addressing the physical and psychological aspects of recovery, athletes can return to their sport with improved resilience and confidence.

Keywords: depression, mental health, mental health disorders, injuries, athletes

Introduction

In recent years, there has been a growing focus on understanding the psychosocial well-being of elite athletes, particularly about injuries, which significantly affect their physical and mental health (1). While athletes are often praised for their physical resilience, many face psychological challenges, especially following injuries, which can contribute to the development of mental health issues. Athletes experience symptoms of depression, stress, anxiety, and other mental health disorders at rates similar to those in the general population, with some evidence suggesting the prevalence may even be higher among athletes (2). The unique pressures and stressors athletes face in their environment can exacerbate these conditions, particularly after an injury (1). A sports-related injury refers to any physical harm sustained by an athlete during sports activities, whether in competition or training, regardless of medical care or breaks from the sport. Musculoskeletal injuries, the most common sports-related injury, often increase an athlete's risk of sustaining additional injuries over time (2). Athletic injuries not only have the potential to trigger or worsen mental health disorders, but mental health issues, in turn, can delay recovery, reduce the chances of returning to play, and negatively impact athletic performance (1,3). Given the significant impact mental health has on injured athletes, it is crucial to study this topic further and advocate for better mental health support for athletes in recovery.

Depression and other mental health disorders in athletes

Depression is a common and severe mental disorder affecting approximately 5% of the adult population worldwide, making it a global cause of disability (4). It is characterized by

persistent sadness, increased fatigue, loss of energy, and diminished interest or pleasure in daily activities. Additional cognitive and physical symptoms may include difficulty concentrating, indecisiveness, changes in sleep and appetite, and low self-worth. As a widespread mental health condition, depression profoundly impacts daily functioning and overall well-being, underscoring the need for adequate recognition and treatment. Depression is relatively common among athletes, with around 34% of elite-level athletes reporting some symptoms of depression (5,6) . Studies on college elite athletes have found that 23.7% exhibited clinically significant depressive symptoms, with 6.3% experiencing moderate-to-severe levels. Additionally, female athletes reported significantly more depressive symptoms than their male counterparts (7) . According to other studies, elite athletes competing in individual sports reported higher levels of depressive symptoms than those in team sports (8). About other mental disorders, a meta-analysis of 11 studies found that 19.6% of 3335 elite athletes from teams (cricket, football, handball, ice hockey, rugby) and Olympic sports (boxing, gymnastics, judo, rowing, swimming) reported distress symptoms. Sleep disturbances affected 26.4% of 4782 athletes, anxiety/depression symptoms were present in 33.6% of 2895 athletes, and alcohol misuse was reported by 18.8% of 5555 athletes. Other studies found eating disorders in 1%–28%, panic disorder in 1%–5%, and gambling issues in 2%–7%. Incidence rates over 6–12 months ranged from 6% for alcohol misuse to 57% for anxiety/depression (9). Considering age, the 16–24 age group in this sample showed a higher prevalence of anxiety, depression, and distress symptoms compared to other age groups (10). Other studies reported that mental health symptoms vary between female and male athletes. Females more frequently report anxiety, depression, distress, and disordered eating, whereas males show higher rates of alcohol misuse, illicit drug use, and gambling (11). It also has been proved that women athletes experience lower mental well-being than males (12). It has been theorized that females are often encouraged to be more socially oriented and to express their emotions more openly than males. As a result, they may be more likely to report negative emotions (13).

Stressors and their impact on athletes' mental health

Regular physical activity is known to alleviate mental health symptoms, leading to the belief that athletes are less prone to mental health issues compared to the general population (14). However, the psychological advantages of athletic involvement may be overshadowed by the

significant stressors, which can still impact mental well-being. Although professional athletes are frequently praised for their physical endurance, many also encounter significant psychological challenges. A career in professional or elite sports involves over 640 unique stressors that can contribute to the development of mental health symptoms (15). These are just a few factors: environmental and internal pressures, injuries and recovery time, strict routines, inadequate financial support, coach expectations, excessive training, burnout, conflicts within the team, less perceived social support, and limited social life (16). Athletes must dedicate significant mental and physical effort to their sport while facing constant pressure to succeed. Moreover, the increasing media attention on elite sports has amplified this pressure, exposing athletes to public evaluation and criticism (10,17). An athlete's satisfaction with their career is often shaped by their perception of success. Career dissatisfaction has been linked to increased levels of anxiety, depression, and distress among elite athletes across various sports. Research suggests that elite athletes are more likely to experience depressive symptoms following competitive losses (18) or when they fall short of their performance goals (6,10). Additionally, the transition out of sports can be a challenging phase for athletes, often increasing their risk of experiencing mental health issues (9). Athletes are less inclined to seek help compared to non-athletes, often due to perceived stigma, embarrassment, limited mental health awareness, and concerns about maintaining their privacy (19).

Injuries and their effect on athletes' mental health

A sports injury is any physical injury an athlete sustains while participating in sporting activities. These injuries can happen during practice or competition, regardless of whether they need medical care or force the athlete to take time off (5). Musculoskeletal injuries are the most frequently occurring injuries in sports and can increase the risk of future injuries as an athlete's career progresses. These types of injuries affect various structures, including bones, tendons, muscles, ligaments, or a combination of these tissues (3,5).

The intense physical demands on elite athletes put them at a higher risk of injury compared to the general population. A prospective cohort study of young elite athletes found that the average weekly prevalence of significant injuries is 17% (20). Preinjury factors such as biological, physical, psychological, and sociocultural influences, with stress being the most significant - can heighten an athlete's risk of sustaining an injury and hinder the recovery

process (21,22). Research shows that older athletes are more likely to sustain injuries than younger athletes, and having a previous injury significantly increases the likelihood of suffering from another one (23).

From a biological perspective, when an athlete sustains an acute injury, the body triggers a stress response via the hypothalamic-pituitary-adrenal (HPA) axis, increasing cortisol production. Cortisol, a key stress hormone, helps regulate inflammation and pain, aiding short-term recovery. However, prolonged elevated cortisol levels can disrupt healing by weakening the immune system, slowing tissue repair, and impairing wound healing (24,25). Research shows that excessive cortisol inhibits necessary inflammatory responses, making the body less effective at repairing tissue damage and increasing the risk of slow recovery or infection. Additionally, psychological stress - such as anxiety, fear of reinjury, and uncertainty - can further elevate cortisol, creating a cycle where emotional distress hinders physical recovery, and delayed healing amplifies stress (24,26).

It has been proven that an athlete's physical and mental health are deeply interconnected (1). After an injury, multiple factors—such as cognition, emotions, and behavior - are closely linked and can impact each other over the short and long term (27). Research has associated injuries with common mental disorders among elite athletes across various sports. It was shown that injured athletes have higher symptoms of depression and anxiety disorders (28). Understanding the mechanisms behind athletes' injuries and the resulting depressive symptoms is crucial and still requires further investigation. When an athlete sustains an injury, it is natural for them to have an emotional response, which involves understanding the medical details provided by the healthcare team and emotionally adjusting to the injury. The typical emotional reactions to injury include sadness, feelings of isolation, loss of motivation, anger, frustration, changes in appetite, sleep disturbances, and disengagement (21). These emotional responses may contribute to an increase in depressive symptoms (5). Another possible explanation is that many athletes strongly identify with their sporting role, often lacking a developed sense of self beyond their athletic career. As a result, sustaining an injury can pose a significant threat to their identity, leading to feelings of profound loss (10,21).

Additionally, the fear of reinjury and the uncertainty surrounding an athlete's return can increase psychological distress. The interruption of an athlete's usual routine, along with the emotional stress of not knowing when recovery will occur, can create feelings of helplessness, which is also a key contributor to depression (29). It has been shown that chronic pain and the prolonged recovery process could contribute to mental health challenges. Some studies showed the association between musculoskeletal injury and pain, and it was proven that back

pain is linked to stress and depression in competitive athletes, with no significant differences observed between the sexes. It is important to note that musculoskeletal injuries can exacerbate pain levels, and pain itself serves as a key predictor of depressive symptoms in athletes (30). A long recovery time after injury can result in a decline in athletes' overall quality of life (31). Some research has revealed that the psychological impact of sports injuries can continue even after physical recovery is complete. These effects may include heightened depression, anxiety, fear of reinjury, social withdrawal from teammates, and decreased motivation during rehabilitation (29). Moreover, loss of conditioning and strength due to injury leaves athletes feeling a loss of control over their bodies and skills (32).

The typical emotional reactions to injury are common, but they can become problematic when they do not improve, worsen over time, or seem too intense. Depression, which was already mentioned above, is a concerning response to injury. It is a significant red flag, as it may amplify other emotional reactions and negatively affect recovery. A retrospective study on football players from 42 institutions found that 33% of those who sustained injuries exhibited high levels of depressive symptoms, as measured by the Center for Epidemiological Studies Depression Scale, in contrast to 27% of non-injured players (33). In another study, the researchers showed that 51% of athletes who experienced an injury during the study reported mild to severe depressive symptoms, as indicated by the Beck Depression Inventory (BDI). However, one limitation of the study was its reliance solely on self-reported data to measure depression (34). What is more, professional athletes who pause or retire from their careers because of injuries frequently face mental health challenges, including depression and anxiety (35).

About other mental health disorders, substance use and abuse might also be a problematic reaction, with athletes often turning to various substances to manage their emotions. For instance, alcohol is commonly consumed to counteract manic states, while cocaine may be used to stimulate and alleviate feelings of depression. Additionally, alcohol, recreational drugs, and prescription narcotics are frequently used as forms of self-medication in an attempt to lift the mood during periods of depression (21). Other problematic responses to injury are disordered eating patterns and eating disorders. Injured athletes might restrict their food intake because they feel they "do not deserve" to eat, which can trigger disordered eating. Injuries can heighten this vulnerability for those already at risk. It has also been shown that problematic responses among student-athletes include gambling, legal issues, and fighting. All of these reactions, along with the previously mentioned depression, alcohol abuse, and eating disorders, can occur concurrently (21,36,37)

In a study examining depression and alcohol use among 262 collegiate athletes, 21% reported high alcohol consumption and related problems. A correlation was found between self-reported depression symptoms and alcohol abuse, with athletes experiencing severe depression and psychological issues showing a significantly higher rate of alcohol misuse compared to those with milder symptoms (21). What is more, a review of five collegiate athletes who died by suicide revealed common factors, including consecutively notable success before injury, a serious injury requiring surgery, extended rehabilitation and restriction from play, difficulty returning to their previous level of performance, and being replaced by a teammate in their position (38). In 1998, Olympic skier Picabo Street suffered significant leg and knee injuries, leading to deep depression during her recovery. She described feeling like a "caged animal" due to atrophying muscles and new scars. After treatment, she returned to skiing before retiring. Another athlete, American football player Kenny McKinley, after a knee injury and surgery, struggled emotionally and tragically took his own life in 2010. These cases highlight how injuries can lead to severe depression, suicidal thoughts, or even suicidal acts (21).

Conversely - the impact of mental health on injury risk and recovery in athletes

It has been well established that sports injuries can negatively impact athletes' mental health. Conversely, some reviews have provided evidence that mental health disorders in athletes are linked to an increased risk of injury (1). Athletes at all levels, whether youth, high school, or professional, face similar challenges, including environmental pressure, injuries, performance slumps, prolonged recovery periods, and mental health struggles. The demands of high-level competition require significant physical and mental resilience. Athletes may experience common symptoms such as mood swings, irritability, or social withdrawal; however, it is essential also to recognize clinically diagnosed mental health disorders. Several analyses have demonstrated that mental health affects injury risk. Symptoms such as competitive anxiety and tension are more closely related to the frequency of injuries. In contrast, factors such as anger, hostility, anxiety, and overall negative mood are linked to injury severity (1,39). A 2017 study found a significant link between preseason anxiety and/or depressive symptoms and the subsequent risk of injury in athletes. Nearly 75% of all injuries were connected to these symptoms (40). Both genders showed that the anxiety before the season remained strongly associated with more excellent injury rates. Although a history of injury is recognized as a

factor that increases the risk of future injuries, depression remained independently associated with a higher likelihood of injury, even when this variable was taken into account (41). Another cohort study involving 307 participants at the 2015 International Association of Athletics Federations World Championships in Beijing, China, proved that athletes who reported experiencing physical illness symptoms leading to anxiety were five times more likely to incur an injury during the events (42). It was also proved that depressive symptoms can contribute to physiological and cognitive changes, such as increased muscle tension and reduced focus, potentially elevating the risk of musculoskeletal injuries (43). Another perspective suggests that impaired decision-making and inadequate risk assessment may increase injury susceptibility. Additionally, prior injuries have been identified as a significant risk factor for future injuries (5). Some research indicated that depressive symptoms heighten injury risk in men, but only when combined with anxiety (40). While one study (44) found that women reported higher levels of depression than men, other studies (40,45) found no gender-based differences in injury-related depression risk. Although results differ, research consistently shows that depressive symptoms are more common in women, both in the general population and among athletes (5). Growing evidence indicates that mental health also influences the risk of sports-related concussions and recovery time. Athletes with preinjury aggression or psychotic traits are at greater risk for concussions, while those with baseline depression, anxiety, and irritability are more likely to experience persistent post concussive symptoms (1). Attention-deficit/hyperactivity disorder (ADHD) has also been linked to an increased risk of concussion and delayed recovery. A study of National Collegiate Athletic Association (NCAA) athletes found that 50% of 139 athletes who have ADHD reported a history of at least one concussion, compared to only 14% of athletes without ADHD (46).

According to the above, sports injuries can have a detrimental effect on an athlete's mental well-being. Likewise, mental health is crucial in athletic performance and is closely connected to the likelihood of injury sustained. Mental health disorders in athletes not only contribute to a higher risk of injury but also lead to less favorable outcomes, such as more extended recovery periods, a greater likelihood of reinjury, lower chances of returning to the sport, and diminished performance after resuming competition. All of this highlights that physical and mental health are deeply interconnected and cannot be considered separately (1).

The psychological and emotional aspects of injury rehabilitation in athletes

Rehabilitation is crucial after an injury, aiming to safely return athletes to their sport while preventing further injuries (47) . The process begins with assessing the injury's severity and any related disabilities, which helps set clear rehabilitation goals. Based on this assessment, an individualized plan is created, incorporating strength training, flexibility exercises, balance training, and functional movement exercises. These components focus on rebuilding strength, restoring range of motion, and improving stability and proprioception. Physical therapy techniques such as ultrasound, electrical stimulation, and cryotherapy are employed to reduce pain and inflammation. Progress is continuously monitored, and treatment plans are adjusted based on the athlete's feedback and outcomes (24,47).

All factors, including how an athlete feels, thinks, and behaves, are connected to the post-injury recovery process. It has been well established that psychosocial factors have been identified as key predictors of rehabilitation outcomes (48) . Some key factors include motivation, self-confidence, perceived control, autonomy, connection, competence, emotions, thoughts, and behaviors. Some research highlighted the issue of poor emotional openness, with athletes often reluctant to share their feelings about their injuries with teammates and coaches (48,49) . It is crucial to note that a lack of social support seems to be linked to unsuccessful rehabilitation and continues to be a common issue when athletes return to sports (49,50) . However, what is important is that several studies found that as rehabilitation progressed toward returning to sport, total mood disturbance and total negative mood decreased while more positive mood states emerged. It has also been indicated that viewing an injury as a chance for personal growth and a positive developmental experience was linked to successful rehabilitation (49,51) . This implies that practitioners should guide athletes to view the injury as a chance for personal growth to promote successful rehabilitation outcomes.

A systematic review of 983 athletes identified 15 psychological factors that influence rehabilitation outcomes. Among these, three key elements from self-determination theory—autonomy, competence, and relatedness—were the most significant in achieving successful rehabilitation and returning to pre-injury performance levels (52).

Although returning to sport is often viewed as a positive outcome of rehabilitation, several studies have reported increased levels of anxiety and/or fear during the transition. An athlete's mental readiness to return to play seems to depend on fear, anxiety, confidence in performing

well, and concern about reinjury. It has also been shown that factors such as being female, young, having limited injury experience, experiencing negative emotions, and feeling isolated are associated with less favorable rehabilitation outcomes (48,49).

During post-injury and rehabilitation time, athletes may be more vulnerable to mental health challenges due to a reluctance to seek help, fear of stigma, or viewing counseling as a weakness. Many are conditioned to push through pain, may lack healthy coping strategies, or struggle with identity beyond their sport. Injury or illness can threaten this identity, leading to feelings of loss. Additionally, since exercise often serves as a coping mechanism, its absence due to injury may trigger negative emotional responses (21). A study on elite athletes aged 16–23 found that focus group discussions identified stigma as the biggest perceived obstacle to seeking help. Other key barriers included limited knowledge about mental health and previous negative experiences with seeking support (53). The research also found that support from others, positive past experiences, internet access, and encouraging attitudes - especially from coaches - helped athletes seek help (53,54). The information above underscores the importance of recognizing that injured athletes are emotionally vulnerable, and their emotional well-being may be at risk during rehabilitation. It also emphasizes that physical and psychosocial recovery from injury often do not align in terms of timing (48).

Mental health interventions and strategies for injured athletes

The whole post-injury process is believed to be cyclical. For instance, thoughts and feelings can influence injury-related emotions and behaviors and vice versa. Athletes respond differently to injuries, from the initial phase through recovery and rehabilitation to returning to activity. Most recover fully, but severe injuries or illnesses can end careers, requiring psychological and medical support (21). More focus should be directed towards understanding and enhancing the mental health of elite athletes. Moreover, routinely assessing career satisfaction in elite athletes could help detect potential mental health concerns early (10).

When athletes get injured, their sports environment should inform them about the facilitators of help-seeking identified in the study mentioned above. These include mental health education and awareness, strong social support, encouragement from others, trust in service providers, confidentiality, adequate time, integration into the athlete's routine, and a safe environment for emotional expression and openness (53). Emphasizing the role of medical

staff in early referral and management of mental health concerns is crucial. Above all, a strong and honest relationship between athletes and their trainers is vital, as they spend a significant amount of time together during training sessions. This is why awareness among athletic coaches is important, as they sometimes overlook or marginalize symptoms of depression and other mental health disorders. A survey of National Collegiate Athletic Association (NCAA) athletic trainers found that while nearly 50% believed the training room was the best place for mental health care, only 20% reported that having a mental health provider there would be beneficial (55) . Athletic trainers, team physicians, psychologists, and healthcare providers should recognize common mental health signs and symptoms and know available treatment resources. They should work to destigmatize mental health issues, helping athletes understand that mental health is just as important as physical injuries (21).

Coaches, athletic trainers, and team physicians should support injured athletes by keeping them engaged and encouraging them to seek help rather than simply "toughing it out." Additionally, educating athletes and staff about available resources and collaboration is vital for effective care (21,56) . All the support from the athletes' environment helps them feel valued beyond their performance or identity as athletes (57) . Incorporating mental health screening questions into preparticipation exams and physicals may help identify issues early. Questionnaires such as the Generalized Anxiety Disorder (GAD-7) (58) for anxiety and the Patient Health Questionnaire (PHQ-9) (59) for depression can be helpful both at baseline and during return-to-activity assessments. Including these screenings in sports and physicals can normalize mental health discussions and reduce stigma among the whole athletes' environment (60) . Another study suggested that internet-based interventions could help clarify mental health issues, educate individuals about common signs and symptoms, and highlight the advantages of seeking help (54).

It is important to have a fundamental understanding of effective strategies for treating mental health issues and enhancing overall well-being and performance. Approaches that boost resilience and mental toughness are likely to reduce stress and help alleviate depressive symptoms (61,62) . Placing more focus on coping strategies, especially emotion-focused techniques, mindfulness practices, and stress management treatments, could help alleviate the impact of injuries (1) . Athletes who have mastered relaxation techniques and regularly seek social support can focus solely on recovery. Moreover, if they have learned to concentrate on positive, controllable factors, they may view injuries as challenges to overcome on their way to success (57). If athletes have effective coping strategies for handling stress, they are likely to see the rehabilitation process as more manageable. If these techniques are lacking, athletes

should be given practical tools, such as relatable stories, to help them cope right away (63). Relaxation techniques can also help when athletes must protect injured areas but still feel the urge to move. Additionally, relaxation techniques may help reduce pain. Breathing exercises and progressive muscle relaxation (PMR) can be efficient. However, these techniques should be adapted to the injury to prevent straining the affected muscles (57).

Visualization, or motor imagery training, is a valuable technique for injured athletes (64). By vividly imagining sports movements, exercises, or competition scenarios, athletes can ease the stress caused by their absence from the sport. Depending on the rehabilitation phase, it can help refine technique, manage competition anxiety, or prepare for a return to play (57). Additionally, virtual reality technology provides a promising way to reduce stress and enhance skills by simulating realistic sports scenarios without direct physical involvement (65).

Pushing through pain is often praised and encouraged by sports society. Enduring pain and injury may be mistakenly regarded as heroic or a sign of exceptional toughness. It is essential to consider pain during rehabilitation when determining the following steps and adjusting goals as needed. Since pain is a deeply personal experience, it should be assessed in a way that caters to each individual's unique situation (57). Distraction and relaxation techniques can be effective initial approaches to managing pain, helping athletes cope with discomfort, and preventing negative goal-setting (66). When distraction is not adequate for managing sports injury pain, focusing on the pain can help athletes accept and control it, preventing negative self-assessment. Recognizing pain and taking the proper steps to manage the discomfort and the injury can help reduce stress and prevent negative behaviors, especially in the early stages of rehabilitation. This approach addresses the root cause rather than emotional reactions like frustration or sadness. In later rehabilitation phases, techniques such as acceptance or association—potentially through storytelling—can benefit injured athletes (57,63).

In some cases, coping mechanisms may not be enough, making professional help necessary from mental health specialists such as psychologists, psychiatrists, counselors, or therapists. Counseling, interpersonal therapy, or cognitive-behavioral therapy (CBT) can be vital in restoring confidence and helping athletes get back on track. In some cases, antidepressant medication may also be essential (32,67). Cognitive-behavioral therapy is a helpful method for athletes recovering from injuries, as it addresses both mental and physical challenges. It works by changing negative thought patterns that could slow recovery. The process starts with an assessment, where therapists understand the athlete's emotions and mindset. Then, they set realistic goals together to boost motivation and reduce feelings of helplessness. Next,

cognitive restructuring helps athletes replace negative thoughts with more positive and constructive ones. Behavioral activation encourages them to return to rehab exercises, rebuilding confidence and control slowly. Finally, therapists monitor progress and adjust the therapy as needed to ensure it remains effective. This approach helps athletes feel more empowered, better manage their emotions, and stay motivated throughout their recovery (24,68) . A longitudinal study of basketball players recovering from acute sports injuries highlighted the importance of mental health in the recovery process. Athletes who participated in both CBT and exercise therapy experienced reductions in anxiety, stress, and depression, along with improved psychological well-being and greater resilience in coping with the mental challenges of sports injuries (24).

Conclusion

The psychological well-being of elite athletes, particularly regarding injuries, is crucial. Athletes often face mental health challenges like depression, stress, and anxiety, which can be exacerbated by injury (2) . Musculoskeletal injuries increase the risk of further injury and negatively impact mental health, hindering recovery and performance. Loss of competition, separation from teammates, and uncertainty about recovery can lead to psychological stress. While emotional responses are expected, prolonged reactions can lead to depression, anxiety, eating disorders, or substance abuse. Feelings of helplessness from disruption and recovery uncertainty can contribute to depression (69) . Therefore, understanding the link between physical injuries and mental health is essential, and better support for athletes' mental well-being during recovery is needed. A comprehensive plan to screen and manage mental health concerns, along with positive coping strategies and early identification, is crucial. Techniques such as interpersonal therapy, cognitive-behavioral therapy, relaxation exercises, and visualization can aid recovery, and in some cases, antidepressant medication may also be necessary. Collaboration among coaches, trainers, and healthcare providers is key, and when traditional coping mechanisms fail, professional intervention and counseling can support athletes in regaining confidence and returning to their sport.

Disclosure

Authors contribution:

Marta Dzieciatkowska: Conceptualization, Formal analysis, Writing review and editing, Project administration

Paulina Horwat: Software, Check

Weronika Pierudzka: Methodology, Investigation

Anita Szymanska: Resources, Writing-rough preparation

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References:

1. Rogers DL, Tanaka MJ, Cosgarea AJ, Ginsburg RD, Dreher GM. How mental health affects injury risk and outcomes in athletes. Sports Health [Internet]. 2024 Mar 1 [cited 2025 Mar 27];16(2):222–9 https://doi.org/10.1177/19417381231179678

2. Rice SM, Purcell R, De Silva S, Mawren D, McGorry PD, Parker AG. The mental health of elite athletes: A narrative systematic review. Sports Med [Internet]. 2016 Sep 1 [cited 2025 Mar 27];46(9):1333–53. https://doi.org/10.1007/S40279-016-0492-2
3. Avedesian JM, Forbes W, Covassin T, Dufek JS. Influence of cognitive performance on musculoskeletal injury risk: a systematic review. Am J Sports Med [Internet]. 2022 Feb 1 [cited 2025 Mar 27];50(2):1–9. https://doi.org/10.1177/0363546521998081
4. Lyus R, Buamah C, Pollock A. Global Burden of Disease 2017 estimates for Major Depressive Disorder: a critical appraisal of the epidemiological evidence. J R Soc Med [Internet]. 2023 Sep [cited 2025 Mar 27];14(9). https://doi.org/10.1177/20542704231197594
5. Kemper HCG, Marconcin P, Silva AL, Flôres F, Nunes A, Lourenço JF, et al. Association between musculoskeletal injuries and depressive symptoms among athletes: a systematic review. Int J Environ Res Public Health [Internet]. 2023 [cited 2025 Mar 27];20. https://doi.org/10.3390/ijerph20126130
6. Hammond T, Gialloreto C, Kubas H, Davis HH. The prevalence of failure-based depression among elite athletes. Clin J Sport Med. 2013 Jul;23(4):273–7 DOI: 10.1097/JSM.0b013e318287b870
7. Wolanin A, Hong E, Marks D, Panchoo K, Gross M. Prevalence of clinically elevated depressive symptoms in college athletes and differences by gender and sport. Br J Sports Med [Internet]. [cited 2025 Mar 27]; https://doi.org/10.1136/bjsports-2015-095756
8. Nixdorf I, Frank R, Hautzinger M, Beckmann J. Prevalence of depressive symptoms and correlating variables among German elite athletes. J Clin Sport Psychol [Internet]. [cited 2025 Mar 27]; https://doi.org/10.1123/jcsp.7.4.313
9. Gouttebarge V, Castaldelli-Maia JM, Gorczynski P, Hainline B, Hitchcock ME, Kerkhoffs GM. Occurrence of mental health symptoms and disorders in current and former elite athletes: a systematic review and meta-analysis. Br J Sports Med [Internet]. 2019 [cited 2025 Mar 27];53:700–7. https://doi.org/10.1136/bjsports-2019-100671
10. Foskett R. The mental health of elite athletes in the United Kingdom. J Sci Med Sport [Internet]. [cited 2025 Mar 27]; https://doi.org/10.1016/j.jsams.2017.11.010
11. Kew ME, Dave U, Marmor W, Olsen R, Jivanelli B, Tsai SHL, et al. Sex Differences in Mental Health Symptoms in Elite Athletes: A Systematic Review and Meta-analysis. Sports Health. 2024 Aug 11; DOI: 10.1177/19417381241264491
12. Kuettel A, Pedersen AK, Larsen CH. To flourish or languish, that is the question: Exploring the mental health profiles of Danish elite athletes. Psychol Sport Exerc. 2021;55:101946. DOI: 10.1016/j.psychsport.2020.101946.

13. Altemus M, Sarvaiya N, Epperson CN. Sex differences in anxiety and depression: Role of gonadal hormones. Psychiatr Clin North Am. 2014;37(4):519–31. DOI: 10.1016/j.psc.2014.08.006.
14. Lane AM, Di Fronso S, Martín-Rodríguez A, Gostian-Ropotin LA, Beltrán-Velasco AI, Belando-Pedreño N, et al. Sporting mind: the interplay of physical activity and psychological health. Sports. 2024;12(1):37. doi: 10.3390/sports12010037.
15. Arnold R, Fletcher D. A research synthesis and taxonomic classification of the organizational stressors encountered by sport performers. J Sport Exerc Psychol. 2012;34(3):397-429. DOI: 10.1123/jsep.34.3.397
16. Sudano LE, Collins G, Miles CM. Reducing barriers to mental health care for student-athletes: An integrated care model. Fam Syst Health [Internet]. 2016 Nov 28;35(1):77–84. https://doi.org/10.1037/fsh0000242
17. Kristiansen E, Halvari H, Roberts GC. Organizational and media stress among professional football players: Testing an achievement goal theory model. Scand J Med Sci Sports. 2012 Aug;22(4):569-79. DOI: 10.1111/j.1600-0838.2011.01371.x.
18. Jones MV, Sheffield D. The impact of game outcome on the well-being of athletes. Int J Sport Exerc Psychol. 2007 Jan;5(1):54-65. DOI: 10.1080/1612197X.2007.9671835.
19. Uphill M, Sly D, Swain J. From mental health to mental wealth in athletes: Looking back and moving forward. Front Psychol. 2016 Jun 21;7:1309. DOI: 10.3389/fpsyg.2016.01309.
20. Moseid CH, Myklebust G, Fagerland MW, Clarsen B, Bahr R. The prevalence and severity of health problems in youth elite sports: A 6-month prospective cohort study of 320 athletes. Scand J Med Sci Sports. 2018 Apr 1;28(4):1412–23. DOI: 10.1111/sms.13047.
21. Putukian M. The psychological response to injury in student athletes: a narrative review with a focus on mental health. Br J Sports Med. 2016 Mar;50(3):145–52. doi: 10.1136/bjsports-2015-094777.
22. Smith AM, Scott SG, Wiese DM. The psychological effects of sports injuries coping. Sports Med. 1990;9(6):352–69. doi: 10.2165/00007256-199009060-00002.
23. Arnason A, Sigurdsson SB, Gudmundsson A, Holme I, Engebretsen L, Bahr R. Risk factors for injuries in football. Am J Sports Med. 2004 Jan;32(Suppl 1):5S-16S. doi: 10.1177/0363546503261843.
24. Zhao W. A longitudinal analysis of psychological, physiological, and rehabilitation outcomes in basketball players following acute sports injuries. Biomechanics TZM&C. 2024 [cited 2025 Mar 27]. DOI: https://doi.org/10.62617/mcb451

25. Haraldsdottir K, Watson AM. Psychosocial impacts of sports-related injuries in adolescent athletes. Current Sports Medicine Reports. 2021 [cited 2025 Mar 27]; DOI: 10.1249/JSR.0000000000000809
26. Herrero CP, Jejurikar N, Carter CW. The psychology of the female athlete: how mental health and wellness mediate sports performance, injury and recovery. Annals of Joint. 2021 [cited 2025 Mar 27]; DOI:10.21037/aoj-20-53
27. Wiese-Bjornstal DM. Psychology and socioculture affect injury risk, response, and recovery in high-intensity athletes: a consensus statement. Scand J Med Sci Sports. 2010 Oct;20(Suppl 2):103–11. https://doi.org/10.1111/j.1600-0838.2010.01195.x
28. Gouttebarge V, Jonkers R, Moen M, Verhagen E, Wylleman P, Kerkhoffs G. The prevalence and risk indicators of symptoms of common mental disorders among current and former Dutch elite athletes. J Sports Sci. 2017 Nov 2;35(21):2148–56. https://doi.org/10.1080/02640414.2016.1246492
29. Husain W, Almashouk Y, Jahrami H. Integrating psychological care in sports injury rehabilitation: A comprehensive mini-review. Tunis J Sports Sci Med. 2024;2(1):14–20. DOI: https://doi.org/10.61838/kman.tjssm.2.1.2
30. Martinez-Calderon J, Flores-Cortes M, Morales-Asencio JM, Luque-Suarez A. Which psychological factors are involved in the onset and/or persistence of musculoskeletal pain? An umbrella review of systematic reviews and meta-analyses. Clin J Pain. 2020;36(8):662–73. Available from: https://doi.org/10.1097/AJP.0000000000000860
31. McGuine TA, Winterstein A, Carr K, Hetzel S, Scott J. Changes in self-reported knee function and health-related quality of life after knee injury in female athletes. Clin J Sport Med. 2012;22(6):543–8. https://doi.org/10.1097/JSM.0b013e318265c5b3
32. Biswas A, Biswas AK. Psychological interventions of injury in athletes: A review. Int J Res Pedagogy Technol Educ Movement Sci. 2023;12(01):80–7. DOI: https://doi.org/10.55968/ijems.v12i01.248
33. Brewer BW, College S, Petrie TA. A comparison between injured and uninjured football players on selected psychosocial variables. 1995.
34. Leddy MH, Lambert MJ, Ogles BM. Psychological consequences of athletic injury among high-level competitors. Res Q Exerc Sport. 1994;65(4):347–54.
35. Mannes ZL, Waxenberg LB, Cottler LB, Perlstein WM, Burrell II LE, Ferguson EG, et al. Prevalence and correlates of psychological distress among retired elite athletes: A systematic review. Int Rev Sport Exerc Psychol. 2019 Jan 1;12(1):265–94. DOI: 10.1080/1750984X.2018.1469162

36. Hammond T, Gialloreto C, Lee S, Roos R, Gibbons F. The prevalence of failure-based depression among elite athletes. Clin J Sport Med. 2013;23(4):348–53. DOI: 10.1097/JSM.0b013e318287b870
37. Huang J, Jacobs D, Derevensky J, Gupta R, Chou C. Gambling and health risk behaviors among US college student-athletes: Findings from a national study. J Am Coll Health. 2007;56(6):491–8. DOI: 10.1016/j.jadohealth.2006.11.146
38. Smith AM, Milliner EK. Injured athletes and the risk of suicide. J Athl Train. 1994;29(2):107–9. https://pmc.ncbi.nlm.nih.gov/articles/PMC1317809/.
39. Lavallée L, Flint F. The relationship of stress, competitive anxiety, mood state, and social support to athletic injury. J Athl Train. 1996;31(4):382–7. https://pmc.ncbi.nlm.nih.gov/articles/PMC1318911/.
40. Li H, Moreland JJ, Peek-Asa C, Yang J. Preseason anxiety and depressive symptoms and prospective injury risk in collegiate athletes. Am J Sports Med. 2017;45(9):2148–55. https://doi.org/10.1177/0363546517705735.
41. Yang J, Cheng G, Zhang Y, Covassin T, Heiden EO, Peek-Asa C. Influence of symptoms of depression and anxiety on injury hazard among collegiate American football players. Res Sports Med. 2014;22(2):147–60. https://doi.org/10.1080/15438627.2014.896774.
42. Timpka T, Jacobsson J, Bargoria V, Périard JD, Racinais S, Ronsen O, et al. Preparticipation predictors for championship injury and illness: cohort study at the Beijing 2015 International Association of Athletics Federations World. Br J Sports Med. 2017;51(4):271–8. https://doi.org/10.1136/bjsports-2016-096634.
43. Kleinert J. Mood states and perceived physical states as short term predictors of sport injuries: Two prospective studies. Int J Sport Exerc Psychol. 2007;5(4):340–51. https://doi.org/10.1080/1612197X.2007.9671839.
44. Appaneal RN, Levine BR, Perna FM, Roh JL. Measuring postinjury depression among male and female competitive athletes. J Sport Exerc Psychol. 2009;31(1):60–76. DOI: 10.1123/jsep.31.1.60
45. Belz J, Heidari J, Levenig C, Hasenbring M, Kellmann M, Kleinert J. Stress and risk for depression in competitive athletes suffering from back pain—Do age and gender matter? Eur J Sport Sci. 2018;18(7):1029–37. https://doi.org/10.1080/17461391.2018.1480243.
46. Alosco ML, Fedor AF, Gunstad J. Attention deficit hyperactivity disorder as a risk factor for concussions in NCAA division-I athletes. Brain Inj. 2014;28(4):472–4. https://doi.org/10.3109/02699052.2014.896474.

47. Labode-Richman VM, Groenewal P. The Importance of Sport Psychology in Basketball. In: Basketball Sports Medicine and Science. 2020. p. 969–81. https://doi.org/10.1007/978-3-030-31119-7_56.
48. Forsdyke D, Smith A, Jones M, Gledhill A. Psychosocial factors associated with outcomes of sports injury rehabilitation in competitive athletes: a mixed studies systematic review. Br J Sports Med. 2016;50(9):537–44. https://doi.org/10.1136/bjsports-2015-094964.
49. Tracey J. The Emotional Response to the Injury and Rehabilitation Process. J Appl Sport Psychol. 2003;15(4):279–93. https://doi.org/10.1080/10413200390242162.
50. Podlog L, Wadey R, Stark A, Lochbaum M, Hannon J, Newton M. An adolescent perspective on injury recovery and the return to sport. Psychol Sport Exerc. 2013;14(4):626–34. https://doi.org/10.1016/j.psychsport.2013.03.001.
51. Ford IW, Eklund RC, Gordon S. An examination of psychosocial variables moderating the relationship between life stress and injury time-loss among athletes of a high standard. J Sports Sci. 2000;18(5):301–12. https://doi.org/10.1080/02640410050074248.
52. Ardern C, Taylor N, Feller J, Webster K. A systematic review of the psychological factors associated with returning to sport following injury. Br J Sports Med. 2013;47(17):1120–6. https://doi.org/10.1136/bjsports-2013-092156.
53. Gulliver A, Griffiths K, Christensen H. Barriers and facilitators to mental health help-seeking for young elite athletes: a qualitative study. BMC Psychiatry. 2012;12(1):157. https://doi.org/10.1186/1471-244X-12-157.
54. Gulliver A, Griffiths K, Christensen H, Mackinnon A, Calear A, Parsons A, Bennett K. Internet-based interventions to promote mental health help-seeking in elite athletes: an exploratory randomized controlled trial. J Med Internet Res. 2012;14(3):e69. https://doi.org/10.2196/jmir.1960.
55. Sudano L, Miles CM. Mental health services in NCAA Division I athletics: A survey of head ATCs. Sports Health. 2017;9(3):262–7. https://doi.org/10.1177/1941738116679127.
56. American College of Sports Medicine, American Academy of Family Physicians. Psychological issues related to injury in athletes and the team physician: a consensus statement. Med Sci Sports Exerc. 2006;38(5):9–13. DOI: 10.1249/mss.0b013e31802b37a6
57. Weiß M, Büttner M. The role of sport psychology in injury prevention and rehabilitation in junior athletes. Front Psychol. 2024;14:254. https://doi.org/10.3389/fpsyg.2023.1026581.
58. Spitzer RL, Kroenke K, Williams JB, et al. A brief measure for assessing generalized anxiety disorder: the GAD-7. JAMA Intern Med. 2006;166(10):1092–7. DOI: 10.1001/archinte.166.10.1092

59. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16(9):606–13. https://doi.org/10.1046/j.1525-1497.2001.016009606.x.
60. Putukian M, Echemendia R, Dettwiler-Danspeckgruber A, Duliba T, Bruce J, Furtado JL. Prospective clinical assessment using Sideline Concussion Assessment Tool-2 testing in the evaluation of sport-related concussion in college athletes. Clin J Sport Med. 2015;25(1):24–8. DOI: 10.1097/JSM.0000000000000102
61. Gerber M, Kalak N, Lemola S, Clough PJ, Perry JL, Pühse U, et al. Are adolescents with high mental toughness levels more resilient against stress? Stress Health. 2013;29(2):164–71. https://doi.org/10.1002/smi.2450.
62. Hjemdal O, Vogel PA, Solem S, Hagen K, Stiles TC. The relationship between resilience and levels of anxiety, depression, and obsessive-compulsive symptoms in adolescents. Clin Psychol Psychother. 2011;18(4):314–21. https://doi.org/10.1002/cpp.717.
63. Arvinen-Barrow M, Clement D, Hemmings B. "This Is the Final Jump," I Respond. Why, Why Do I Utter Those Words? Sport Injury Psychology. 2020;207–16. DOI:10.4324/9780367854997-18
64. Simonsmeier BA, Andronie M, Buecker S, Frank C. The effects of imagery interventions in sports: a meta-analysis. Int Rev Sport Exerc Psychol. 2021;14(1):186–207. https://doi.org/10.1080/1750984X.2020.1732745.
65. Richlan F, Braid J. Virtual reality training in Olympic sports: Promises and pitfalls. 2024 Feb 8. DOI:10.31234/osf.io/dnrck
66. Brewer BW, Buman MP. Attentional focus and endurance performance: Review and theoretical integration. Kinesiologia Slovenica. 2006;12:82–97.
67. Depressive disorders in athletes. Sports Med. The Clinics. 2024. DOI: 10.1016/j.csm.2023.06.011
68. Trinh LN, Brown SM, Mulcahey MK. The influence of psychological factors on the incidence and severity of sports-related concussions: A systematic review. Am J Sports Med. 2020;48(6):1516–25. https://doi.org/10.1177/0363546519897197
69. Clement D, Arvinen-Barrow M, Fetty T. Psychosocial responses during different phases of sport-injury rehabilitation: A qualitative study. J Athl Train. 2015;50(1):95–104. DOI: 10.4085/1062-6050-49.3.52