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Review Article

Integrating Psychological Care in Sports Injury Rehabilitation: A Comprehensive Mini-Review

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Abstract

Background: Athletes often face significant psychological challenges following sports injuries. These challenges, such as increased anxiety, depression, and fear of reinjury, hinder their physical rehabilitation process.

Objective: This mini-review aimed to consolidate existing research on the psychological responses of athletes to sports injuries, emphasizing the importance of integrating mental health care into the physical rehabilitation process.

Methods: The review involved a comprehensive analysis of recent studies, focusing on the emotional and psychological impacts of sports injuries across various sports and age groups. It highlighted common psychological responses including anxiety, depression, isolation, and identity loss.

Results: Injured athletes commonly experience negative emotional reactions such as shock, anger, sadness, irritation, and altered sleep and appetite. They also face increased risks of anxiety, depression, isolation from teammates, loss of identity, fear of reinjury, and low motivation during rehabilitation. These psychological factors can negatively impact adherence to rehabilitation and return to sports.

Conclusions: It is essential for sports medicine professionals to integrate psychological care with physical rehabilitation. Strategies such as regular mental health screening, counseling, motivation techniques, and support systems are recommended. A biopsychosocial approach is vital for addressing the comprehensive needs of injured athletes.

Keywords: *Athlete Recovery, Biopsychosocial Model, Emotional Impact, Injury Management, Mental Health, Psychological Resilience, Rehabilitation Strategies, Well-being*

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1. Introduction

Engagement in sports is linked with substantial enhancements in biopsychosocial health, contributing to improved somatic well-being and psychosocial development (1, 2). Physical activities, ranging from aerobic exercises to competitive team sports, facilitate physiological improvements such as cardiovascular fitness and musculoskeletal strength. Simultaneously, these activities engender psychological benefits, including enhanced cognitive function, emotional regulation, and resilience to stress (3, 4). Sports participation also promotes socialization, fostering teamwork and communication skills, which are crucial in developing a robust social identity and support networks, integral to overall mental wellness (1-5).

However, the incidence of sports-related injuries is a critical concern (6). Sports injuries significantly impact athletes' psychological state, often leading to a spectrum of emotional responses such as anxiety, depression, and stress. The sudden shift from active participation to injury-induced inactivity can trigger feelings of loss, affecting the athlete's identity and self-esteem (6, 7). Moreover, the uncertainty and fear of reinjury upon return can lead to heightened states of psychological distress. This psychological milieu can

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affect the cognitive aspects of athletes, including their focus, decision-making abilities, and overall mental readiness for sport. Addressing these psychological repercussions is essential for a holistic recovery and return to peak performance (6-8).

While the physical dimensions of sports injuries are well-documented and often prioritized in rehabilitation protocols, the psychological implications warrant greater research focus (9, 10). Existing literature predominantly concentrates on immediate psychological responses post-injury but lacks comprehensive exploration of long-term mental health impacts (9, 10). Studies often overlook how sustained psychological stress from injuries can influence an athlete's overall quality of life, adherence to rehabilitation programs, and long-term mental health (9, 10). This gap signifies a need for more extensive research that examines the enduring psychological effects of sports injuries and their implications for holistic rehabilitation practices (9, 10).

Incorporating psychological care in sports injury rehabilitation offers multifaceted benefits. This integrative approach supports the athlete's mental health, essential for complete recovery. Psychological interventions, such as counseling and stress management techniques, are crucial in mitigating the negative mental health effects of injuries, like post-traumatic stress and loss of athletic identity (9-11). This integration aids in enhancing motivation, coping skills, and psychological resilience, crucial for a successful return to sport. Effective psychological support can also lead to improved adherence to physical rehabilitation protocols, thereby expediting the overall recovery process (11).

Based on the identified gaps, this study aimed to synthesize recent literature on psychological responses to sports injuries and highlight the importance of integrating mental health care into the rehabilitation process.

2. Methods

This paper presents a mini-review synthesizing key recent literature on the psychological impacts of sports injuries. Relevant studies were identified through searches of online databases, including but not limited to Embase, Elsevier ClinicalKey, MEDLINE/PubMed, PsycINFO, P Scopus, ScienceDirect, SPORTDiscus, and Web of Science. The authors used keywords such as “sports injury”, “psychology”, “mental health”, “rehabilitation”, “emotional reactions” and “distress”. Priority was given to original quantitative and qualitative research articles published within the past 10 years examining the psychological side of sports injuries across diverse athletic populations.

3. Injuries: the psychological response

Depression, marked by feelings of worthlessness and loss of interest, is a prevalent disorder among athletes (11). Anxiety can also cause unpleasant feelings and behavioral changes among athletes (12). In addition to routine stress, sports injuries can further impact athletes psychologically (13). Research on the influences of psychological factors on injury risk suggests a notable connection between high levels of stress and an increased likelihood of athletes experiencing sports injuries (14, 15). Psychological stress, anxiety, and depression are common consequences of sports injuries (16). Recent studies have shown that the psychological effects of sports injuries can persist even after full physical recovery (17). These include increased symptoms of depression, anxiety, fear of reinjury, isolation from teammates, and low motivation during rehabilitation (17, 18). Figure 1 shows the common emotional response to injury.

Athletes who are injured experience a range of emotional responses and stress, with no predictable sequence. Common emotional reactions include shock, anger, frustration, sadness, depression, isolation, irritation, altered sleep and appetite (19-21). Emotional responses to injury also interact. For example, both the initial trauma of the injury event and the strenuous journey of physical rehabilitation and return to sport can negatively impact mental health (22). Specifically, the stress of suddenly being removed from competition, isolation from teammates, deconditioning effects, uncertainty surrounding recovery timelines and future performance capability have all been shown to take a significant psychological toll on injured athletes (18). Athletes undergo Kubler-Ross’s stages of grief in response to loss of their sporting identity and activity (23). The ability of elite athletes to reach their identity after injury leaves them vulnerable to crisis (24). They can experience profound loss of purpose without their athletic role, fearing being forgotten by coaches (8, 25).

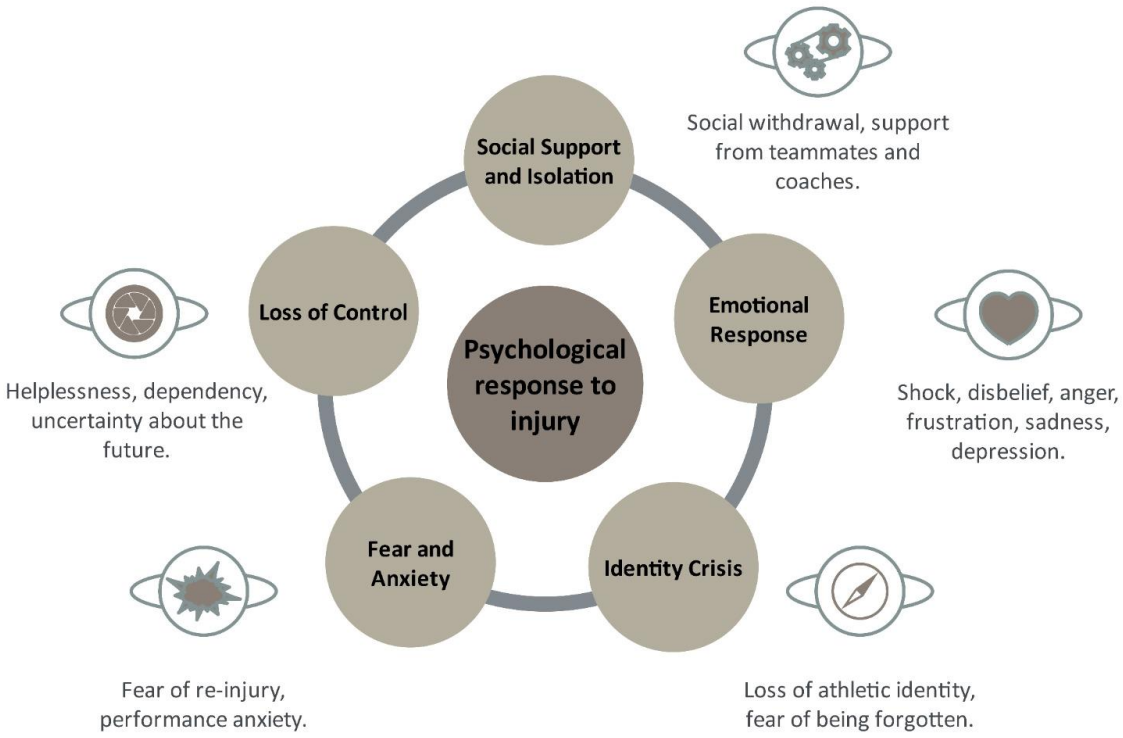

Figure 1. The common emotional response to injury.

Athletes also frequently report anxiety and apprehension about reinjury upon return to sport (26). The nature of postinjury stress is influenced by previous experiences, trauma, and rehabilitation success. General life stress and daily hassles during rehabilitation can delay recovery. Factors such as the cause, severity, timing, and perception of the injury impact the athlete's response. Anxiety is a global response to stressful situations, and trait anxiety, state anxiety, cognitive anxiety, and somatic anxiety contribute to athletes' mental response to stressors. Anxiety may have directional effects, leading to positive or negative outcomes. Pain-related anxiety, influenced by cognitive, physiological, and motivational processes, is a significant aspect of athletes' response to injuries (27). Injured athletes may experience feelings of helplessness, depression, and resentment, particularly if they are unable to return to their sport (28). This anxiety surrounding physical vulnerability negatively affects confidence and performance (29). The psychological impacts of transition, such as depression, substance abuse, and low self-esteem, are noteworthy (30). Professional athletes who take a break or end their careers due to injury often encounter mental health issues such as depression and anxiety (31). Athletes facing involuntary career discontinuation due to injury may struggle with loss and grief, affecting their mental health (32). Additionally, loss of strength and conditioning due to injury leaves athletes feeling loss of control over their bodies and skills (33). Individuals must rely on sports medicine professionals during the uncertain recovery process, which can be mentally challenging (10). Cognitive responses to injury also play a significant role in athletes' psychological adjustment to injuries. Perceived threats to self and well-being result in more adverse consequences. The cognitive responses included decreased self-esteem, attribution activity, and the use of coping strategies. Athletes may attribute their injuries to internal or external factors (34).

The sports medical team primarily addresses the physical consequences of injuries, but athletes often exhibit negative psychological reactions (35). The transition out of sports due to injury can lead to significant behavioral and emotional distress, impacting an athlete's identity and well-being (36). Some athletes isolate themselves from their teams during recovery from perceived loss of belongingness (22, 37). However, social support provides meaning and optimism to injured athletes (18, 38). Teammates, coaches, and social networks are critical for maintaining identity and

connections beyond sport (10). Access to psychological services also aids coping ability (39). Sports psychologists emphasize mental preparation and support throughout recovery to improve rehabilitation and transition back to full competition (39).

4. Caring for Injured Athletes: Supporting Physical and Psychological Recovery

Pain in athletes, often overlooked in favor of physical dimensions, is a psychophysical phenomenon with significant psychological components. Psychological factors play a crucial role in sport injury rehabilitation and can influence and be influenced by biological and social factors. Rehabilitation success is predominantly judged on psychological or behavioral outcomes. Sports medicine experts increasingly recognize the need for a holistic rehabilitation approach that addresses both physical and psychological wellbeing in injured athletes (18, 40). The occurrence of injury and the process of recovery involve both psychological and physiological factors (41). The mental health toll of sports injuries can impede physical recovery and return to sport if left unaddressed (18, 40). Thus, a comprehensive treatment paradigm must incorporate screening and services to promote athletes' psychosocial functioning and physical healing. A recent qualitative study explored injured professional athletes' perspectives on the role of sport medicine professionals (SMPs) in addressing the psychosocial aspects of sport injury rehabilitation (40). Ten male professional football and rugby players were interviewed using a structured guide (40). The findings suggest that SMPs should understand athletes' psychosocial processes during injury and their impact on rehabilitation. SMPs must also understand athletes' self-regulatory processes throughout rehabilitation to indirectly provide appropriate psychosocial support (40).

Adapting to injury involves a mental shift, and rehabilitation efforts can be facilitated through educational psychological strategies. Communication skills and motivation techniques, including biofeedback training, are essential in this process. Specific psychological interventions may include preinjury baseline mental health assessments, patient education on typical emotional reactions to expectations, and graded return to sport protocols (10). Providing injured athletes with mental health counseling and psychoeducation enables early intervention for emotional issues (38). Counseling involves providing detailed information about the injury, the rehabilitation program, and realistic expectations. Motivation techniques differentiate between intrinsic and extrinsic motives, emphasizing the hope of success. Goal setting, relaxation, imagery, positive self-talk, and social support contribute to motivation and healing. Self-efficacy, the belief in one's capability to execute actions, influences engagement choices and effort level. Higher self-efficacy is associated with coping strategies and better pain tolerance. Psychological readiness to return to competition is subjective and relies on athletes' confidence in meeting physical demands.

Sports medicine personnel working with injured athletes can administer validated tools, e.g., the Brunel Mood Scale (BRUMS) (42, 43), to monitor progress. For example, the BRUMS can be administered regularly (e.g., biweekly or monthly) to quantitatively track fluctuations in an athlete's mood and mental state. An initial baseline BRUMS assessment shortly after injury occurrence provides an important point of comparison. Monitoring mood changes via periodic BRUMS assessments allows therapists to detect potential red flags such as spikes in anger, confusion, depression, fatigue, and tension. Elevated negative mood scores signal the need for psychological interventions. For example, high anger and confusion may indicate poor coping, requiring the therapist to spend more time explaining the rationale for rehabilitation exercises. On the positive end, regularly tracking vigor provides insight into the athlete's motivation and engagement with recovery. Improving vigor scores provides therapists with objective data to provide positive feedback about the athlete's mental fortitude.

Progressive goal setting provides purpose and milestones throughout long rehabilitations. Motivational strategies maintain adherence to treatments for optimal healing. Gradual return to activities then allows adaptation both physically and mentally (44). Effective communication involves responsive listening and body rehearsal, and mastery rehearsal aids healing by using positive images and detailed explanations of the healing process. Coping rehearsal prepares athletes for anxiety, worry, and pain, while time projection distances athletes from current challenges, providing relief and effective crisis management. Equally important, social support from coaches, teammates, family, and friends provides empathy, reassurance, and connections vital to resilient psychological recovery (39, 45). This social ecology profoundly influences injured athletes' mindsets and functioning. Coaches play an especially crucial role in facilitating athletes' healthy mental outlook during injury (22).

Advances in technology, including artificial intelligence (AI) and wearable devices, present promising opportunities

to augment the psychological care of injured athletes(46). Machine learning algorithms can analyze data from wearable biosensors and smartphone apps to detect early signs of mental health issues such as depression, anxiety, and poor sleep in recovering athletes(46, 47). Chatbot counselors with natural language processing can provide basic emotional support or cognitive behavioral therapy to improve coping and adherence to rehabilitation plans(48). It is important to note, however, that these AI-driven chatbots are speculative in their application and are not intended to replace human interaction but rather to serve as a supportive tool(48-50). Their role is envisioned as supplementary, assisting healthcare professionals in monitoring and responding to patients' needs more efficiently(48, 49). Athlete monitoring platforms combining AI and wearable metrics can alert health providers to psychological red flags and prompt timely interventions(46). While further research is still needed, preliminary findings suggest that thoughtfully incorporating technology-enabled tools, especially wearable devices and AI(46), could allow sport medicine teams to proactively address the psychological aspects of injury in a quantitative, personalized way. This approach, while innovative, should be seen as complementary to traditional methods, enhancing rather than replacing the essential human elements of psychological care.

5. Limitations

This review has several limitations. Firstly, its scope as a mini-review means it may not cover the topic as extensively as a full-scale review, potentially overlooking some nuanced aspects of psychological care in sports injury rehabilitation. Additionally, focusing on studies published within the last 10 years might omit earlier relevant research that could provide a more comprehensive historical perspective. The reliance on observational and qualitative studies, while valuable, limits the ability to establish causality and make definitive practice recommendations. The broad variety of sports and age groups covered may not fully address specific needs in certain sports or age categories. Also, factors such as injury severity, previous injury history, or the athlete's competition level, which could significantly influence psychological impacts and rehabilitation outcomes, are not extensively considered. Despite these limitations, the review underscores the importance of integrating psychological care in sports injury rehabilitation and highlights key areas for future research.

6. Conclusions

In summary, the integration of psychological care in sports injury rehabilitation emerges as a pivotal element. As a sports scientist specializing in post-injury psychological support, the study suggests incorporating regular mental health evaluations into the injury diagnosis and recovery process. This approach ensures that rehabilitation programs, led by multidisciplinary teams, address both physical and psychological recovery needs. Educating coaches and trainers about the signs of psychological distress and promoting an open dialogue about mental health in sports settings are also crucial. Tailoring care plans to each athlete’s psychological profile can significantly enhance their recovery journey, leading to a more resilient and confident return to sports.

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Consent for Publication

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Competing Interests

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W.H., Y. A. and H. J: conception and design. W.H., Y.A. and H. J: analysis and interpretation of the data. W.H., Y.A. and H.J. drafted the article. H. J: Critically revising the manuscript for intellectual content. H. J: visualizations. All the authors gave their final approval to the version that will be published.

Declaration

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