Reducing the fear of re-injury during rehabilitation through mental imagery as a mental health strategy in sport and exercise

Review

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https://doi.org/10.1515/jirspa-2023-0032
Received September 3, 2023; accepted September 28, 2023;
published online October 13, 2023

Abstract: Returning to sport and exercise following injury requires the athlete to become more confident in the ability to gradually explore the use of the injured area in increasingly complex and challenging ways. Emotional responses, such as fear of re-injury, are a key mental health barrier to a performer's return to sport and exercise. To navigate such psychological responses, performers need well-developed psychological strategies, like mental imagery (MI), to facilitate a successful return to pre-injury levels of sport and exercise. MI is a well-established strategy for dealing with negative symptoms associated with injury, providing a safe and less intimidating environment to practice movements that may be perceived as risky and otherwise performed within physical training due to the fear of causing further injury. This paper aims to provide sport psychologists with recommendations on how to utilize MI to reduce fear of re-injury during the rehabilitation process to successfully facilitate return to sport and exercise. Specific examples are also outlined and discussed.

Keywords: mental health; rehabilitation; injury; mental imagery; fear; re-injury

Introduction

Elite athletes in particular, but also recreational participants in sport, encounter a range of sporting-related stressors that can detrimentally impact mental health [1]. Injury is a major stressor that can contribute to significant mental health challenges for athletes [2]. The risk of injury is an unfortunate reality of competitive sports and recreational exercise. In the 2022 season of the Australian Football League Women's (AFLW) competition, for example, the total injury incidence was 17.1 per 1,000 player hours; concussion, ankle, and anterior cruciate ligament (ACL) were some of the most common injuries sustained [3]. Due to the physical nature of such injuries (e.g., ruptured ligaments), rehabilitation methods commonly focus on restoring physical function to facilitate a return to pre-injury levels of activity. Reconstructive surgery, for example, is typically the most common option athletes select for ACL injuries due to its effectiveness in restoring ligamentous function [4].

Such an approach, however, neglects to address the strain injury has on an athlete's mental health following injury, like depression, frustration, and fear of re-injury [2, 5], and how these responses represent a significant barrier to a successful return to physical activity. For example, in a meta-analytic review, Ardern et al. [6] found that 90 % of individuals recovered normal or near normal near function after approximately 41 months; however, only 44 % of these individuals successfully returned to competitive sport. Of those that did not return to competitive sport, fear of re-injury (19 %) was the main factor preventing return to sport. Further research has consistently been identified fear of re-injury as a prominent psychological factor in the rehabilitation process, associated with chronic injury and failure to return to sport [5–7].

Failure to return to sport has also been shown to lead to poor mental health outcomes, with athletes often experiencing depression, anxiety and tension, and ineffective coping [8]. Taking into consideration how psychological factors, like fear of re-injury, influence a participant's ability to return to sport and increase the risk of poor mental health outcomes, it is crucial for athletes at various levels of participation to have well developed mental skills, such as mental imagery (MI), to meet the psychological and physical demands associated with the rehabilitation process [9–11]. Research suggests that incorporating mental imagery into rehabilitation protocols can effectively improve negative psychological responses associated with injury, such as increased self-confidence and

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efficacy [12, 13], coping with unfamiliar situations [14], reduced pain perception and fear of re-injury [9, 11], and anxiety management [10]. The purpose of this article is to make a case for the use of MI to reduce fear of re-injury during the rehabilitation process, and outline important considerations regarding the development and delivery of MI interventions in applied rehabilitation contexts.

Fear of re-injury and improving rehabilitation outcomes

Following injury, athletes have consistently demonstrated negative emotions such as depression, frustration and fear, either prolonging the rehabilitation process or preventing a return to sport altogether [5, 15]. Therefore, psychological factors, like fear of re-injury, represent a significant threat to mental health and need to be addressed during the rehabilitation process to facilitate a successful return to pre-injury levels of participation. Fear of re-injury, or kinesiophobia, is described as a psychological condition characterised by fear arising from experiencing a previous injury, which can lead to a heightened sensitivity to pain and a belief that movement may cause harm [7]. Having fear of re-injury is associated with decreased rehabilitation outcomes and reluctance to engage in activity that could be perceived as causing further injury [16]. Subsequently, a performers fear of re-injury can lead to either delays in return to sports or failure to return to sport participation, placing the performer at risk of poor mental health outcomes, such as depression, anxiety and increased life stress [7, 8]. Interpreted through the integrated model of psychological response to sport injury and rehabilitation process, fear of re-injury can be viewed as an emotional response [17]. According to this model, individuals cognitively appraise their injury, which then in turn affects three interrelated areas: emotional responses, behavioural responses, and recovery outcomes [15]. For example, an individual's cognitive appraisal of injury may be that they do not believe they are capable of recovering (e.g., reduced self-efficacy), resulting in an emotional response of fear of re-injury and the behavioural response of muscular guarding – described as a reflexive response of the body to protect an injured area – hindering restoration of function to the injured region and potentially risking new injuries to other areas of the body due to overcompensation [15]. Indeed, recent research demonstrates that higher self-efficacy in performing physical activity and lower fear of re-injury are associated with increased likelihood of successfully achieving recovery outcomes [18]. These findings indicate that psychological elements of rehabilitation is crucial to facilitating mental and physical health to successfully return to sport or physical activity. Therefore, a key challenge that faces rehabilitation specialists is restoring a participant's neuromuscular control and motor functions to a level that allows them to return to sports or physical activity while coping with the elevation of detrimental psychological responses to injury.

Consequently, to successfully rehabilitate from injury, athletes and sports participants need well developed psychological strategies, to navigate the cognitive, psychological, and mental health demands associated with the rehabilitation process [19]; one such strategy is mental imagery (MI). MI may provide a potential strategy to provide simulated exposure to movement demands in rehabilitation, providing a safe approach to managing the fear of re-injury concerns of athletes in responding to perceived risky movement context and movement demands [20, 21]. It is well established that MI is an effective strategy for improving learning and performance [22–25] and mental health outcomes [26, 27]. Specific to the negative psychological symptoms experienced during rehabilitation, MI has been found to decrease fear of re-injury and anxiety and increase confidence in motor abilities following injury [9, 28].

Effects of mental imagery on fear of re-injury

Emerging research indicates that the benefits of mental imagery in the rehabilitation process are two-fold, with improvements being demonstrated for physical and psychological rehabilitation outcomes. Lebon et al. [29] explored the effects of motor imagery on muscle activation following ACL reconstruction. They found significant increases in activation of the quadriceps and decreased laxity in the ligaments surrounding the knee, facilitating improved range of motion in the knee. Furthermore, mental imagery has been shown to reduce neurobiological markers linked with anxiety and stress, such as noradrenaline and dopamine [30]. The physical benefits of mental imagery are primarily explained through functional equivalence theories; suggesting that mental imagery activates similar motor areas of the brain as actual movement [31]. The implications for rehabilitation are that mental imagery may be capable of reactivating impaired body parts via activation of relevant motor areas in the brain, improving functionality of the affected areas [21, 32].

In addition to the neurophysiological effects, the benefits of imagery for learning and performance outcomes have been linked with improved psychological outcomes. Rodriguez et al. [9], for example, found that in combination with traditional physical therapy, mental imagery effectively reduced

fear of re-injury and pain perception in athletes following ACL reconstruction. These findings suggest that mental imagery may successfully address reluctance to engage in physical activities – at least mentally – that are perceived as leading to further injury; a key characteristic of fear of re-injury [16].

One explanation for these findings is that mental imagery may facilitate a process of cognitive reappraisal, allowing performers to confront painful and threatening movements in a controlled environment, providing an opportunity for the perceived risks associated with resuming physical activities to the reassessed [15]. Alternatively, mental imagery may reduce fear of re-injury by enhancing a performers self-efficacy – the belief in one's ability to execute action successfully – toward pre-injury movements through the provision of mastery experiences, increasing the performers perceptions of success and the belief that they are capable of obtaining successful movement outcomes [20]. Consistent with this notion, Munroe-Chandler et al. [33] found that mental imagery use in youth soccer players was a significant predictor of self-efficacy and self-confidence. Taken together, these findings suggest that mental imagery could facilitate improved levels of self-efficacy and confidence toward performing risky movements, which may improve the ability to successfully regulate negative emotional responses, like fear of re-injury. The reduction in fear of re-injury may in turn facilitate a successful return to pre-injury levels of physical activity, reducing a performers risk to poor mental health outcomes [8, 9].

Considerations for MI

Returning to sport and exercise following injury requires the athlete to develop a belief in their ability (i.e., self-efficacy) to successfully use of the injured area in increasingly complex and challenging ways. From the perspective of the integrated model of psychological response to the sport injury and rehabilitation process, a performer's beliefs in their abilities come about through cognitive appraisal and in turn trigger emotional responses, such as fear of re-injury [15]. A key characteristic of fear of re-injury is fear of the unknown, resulting in more muscular guarding, pain sensitivity, and anxiety, increasing fear of re-injury and potentially delaying or limiting return to previous performance levels [7, 8, 15]. Therefore, a key function of MI is to improve a performer's self-efficacy toward risky movements, in an effort to mitigate the emotional response of fear of re-injury. One approach to this is using MI to expose athletes to increasingly challenging and complex movements that need to be performed in order to return to play.

In the return from injury, the performer will need to overcome fears relating to testing the injury in unfamiliar, challenging and changing environments. A crucial aspect of this is both physically and psychologically adapting to the increasing variability in the movement constraints that the athlete will experience as they return from the injury. In line with ecological models of motor control, variability in movement can be functional in adapting movement to individual, environmental, and task demands [34, 35]. In return from injury, helping the athletes become comfortable with this increasing variability in movement and movement demands will be critical in managing fear of re-injury. Rehabilitation and overcoming fear of re-injury then would involve developing confidence in being able to adapt movement to changing environmental demands while satisfying task demands [34]. A concern for the performer is coping with these increasing demands and challenges and beginning to be exposed to potentially riskier movement contexts in terms of re-injury, for example, change of direction movements or contact with opponents. A challenge then in overcoming fear of re-injury is how to expose the athlete with fear of re-injury to increasingly risky dynamic movement contexts [21].

MI practice could be designed for the athlete to progressively introduce and incorporate movement variability in preparation for physical exposure to this movement variability and to support fear of re-injury. In physical return to sport and exercise, incorporating movement variability into practice and training would involve performance and repetition of the movement but under increasingly variable movement conditions [34]. For example, an individual recovering from a knee injury in an invasion game such as football will be required to engage in walking, running, change of direction, responding to the movements of others, and physical contact with others. Each increase in variability here is likely to be accompanied with mental health concerns regarding movement recovery and also the potential fear of re-injury. Introducing higher levels of variability early in the return to sport and exercise could be overwhelming for the athlete, so MI practice may be a way to progressively introduce and increase exposure to variability and help the athlete cope with the fear of re-injury prior to and/or synchronously with physical exposure to this movement variability.

A model to scaffold the integration of increasing movement variability in the process of rehabilitation in sport, based on an ecological dynamics perspective of motor control and a constraints-led approach (CLA) to skill acquisition has been proposed by Taberner et al. [36]. The chaos-control continuum (CCC) offers several principles to guide the process of incorporating movement variability into physical rehabilitation, which could be applied to the use of MI practice for coping with and reducing fear of re-injury. The CCC [36] specifies for the progressive and gradual introduction of

movement variability through several stages (see Table 1 for definitions and examples). Such an approach in MI may allow the athlete to prepare for return from injury and reproduce the movement constraints and variability that may prompt fears of re-injury and return to performance.

Designing MI intervention

The benefit of MI is that it offers an opportunity for the athlete to simulate the experiences of the return to sport and exercise while minimising risk of re-injury and provides a safe space to explore the emotions and concerns of that return in relation to re-injury [19]. This could be coupled with actual return to movement to prepare the athlete for safe return to play. MI instructions, therefore, can integrate 'risk' into training according to the CCC to physically prepare the performer for the next stage and introduction of added movement variability and the associated potential fears of re-injury with that increase in movement variability; facilitating the exploration those movement activities in a safe way.

Take for example, an Australian Rules Football player wanting to return to play following a torn ACL from taking a mark (catch) (Figure 1). The sport psychologist begins by getting the athlete to describe the situation to them (without sustaining an injury) in as much detail as possible. The sport psychologist then creates either a written or audio mental imagery script that provides step-by-step instructions of what the athlete should imagine, at this stage, passive knee extension (CCC stage 1).

Table 1: Definitions and examples of stages of CCC (Adapted from [36]).

Stage	Definition	Examples
1: High control	Low movement variability activities	Straight-line walking and running
2: Moderate control	Gradually increasing movement variability through manipulation of task constraints	Walking and running activities that require change of direction
3: Transition to unpredictable/chaotic movements	Introducing more real-world demands within specified limits through the manipulation of task and environmental constraints	Passing and receiving the ball while moving without defenders present
4: Moderate movement variability	Incorporating dynamic movement situations with increased movement speed and skill execution	Catching and passing with defenders present
5: High movement variability	Combining activities that reflect the demands of real-world movement performance contexts with no limitations	Game play

The athlete is then guided through imagining the situation using the script. In line with the integrated model of psychological response to sport injury, the sport psychologist at this stage may assess two interrelated factors: (1) the athlete's self-efficacy or self-confidence toward the injured movement and (2) their current levels of fear of re-injury. Self-efficacy could be measured using the modified Self-efficacy for Rehabilitation Outcome Scale (SER; 18) and fear of re-injury using the Tampa Scale for Kinesiophobia (TSK; 37). Together, these measures will help the sport psychologist to determine whether the athlete is psychologically prepared to progress to the next stage of CCC. Unless SER scores have increased (i.e., increased self-efficacy) and TSK ratings decreased (i.e., reduced fear of re-injury) following MI, the sport psychologist may encourage the athlete to continue imagining this stage until both key measures have improved. Once the athlete is ready to progress, the sport psychologist will then ask the athlete to describe a stage 2 movement according to the CCC. For this example, this would include performing a single leg squat, representing a moderate control movement. After progressing through the stages of the CCC, progressively adding movement variability to MI instructions as guided by appropriate decreases in fear of re-injury, the conjunction with the athlete the sport psychologist can provide a MI script that details the appropriate high variability movement, in this case jumping to take a mark during game play with defenders present (Stage 5 CCC). Below is an example of a mental imagery script at this final stage.

You enter the field of play with your team currently winning by one goal. The ball is progressing down field and your team mate is approaching the forward 50. You call for your teammate to kick the ball high into space past a group of defenders. You run toward the descending ball, your knee feels strong as you change direction to evade a defending player. As you jump a defender you did not see jumps with you to contest the ball, pushing you off balance. You get your hands to the ball before the defender successfully taking the mark, you land strongly on one leg bracing your body against the impact of the defending player, maintaining possession of the ball.

Future research opportunities

Although research has shown MI to be an effective technique for improving psychological responses to injury, such as fear of re-injury, there are a number of potential areas that warrant further research. Researchers could first determine the

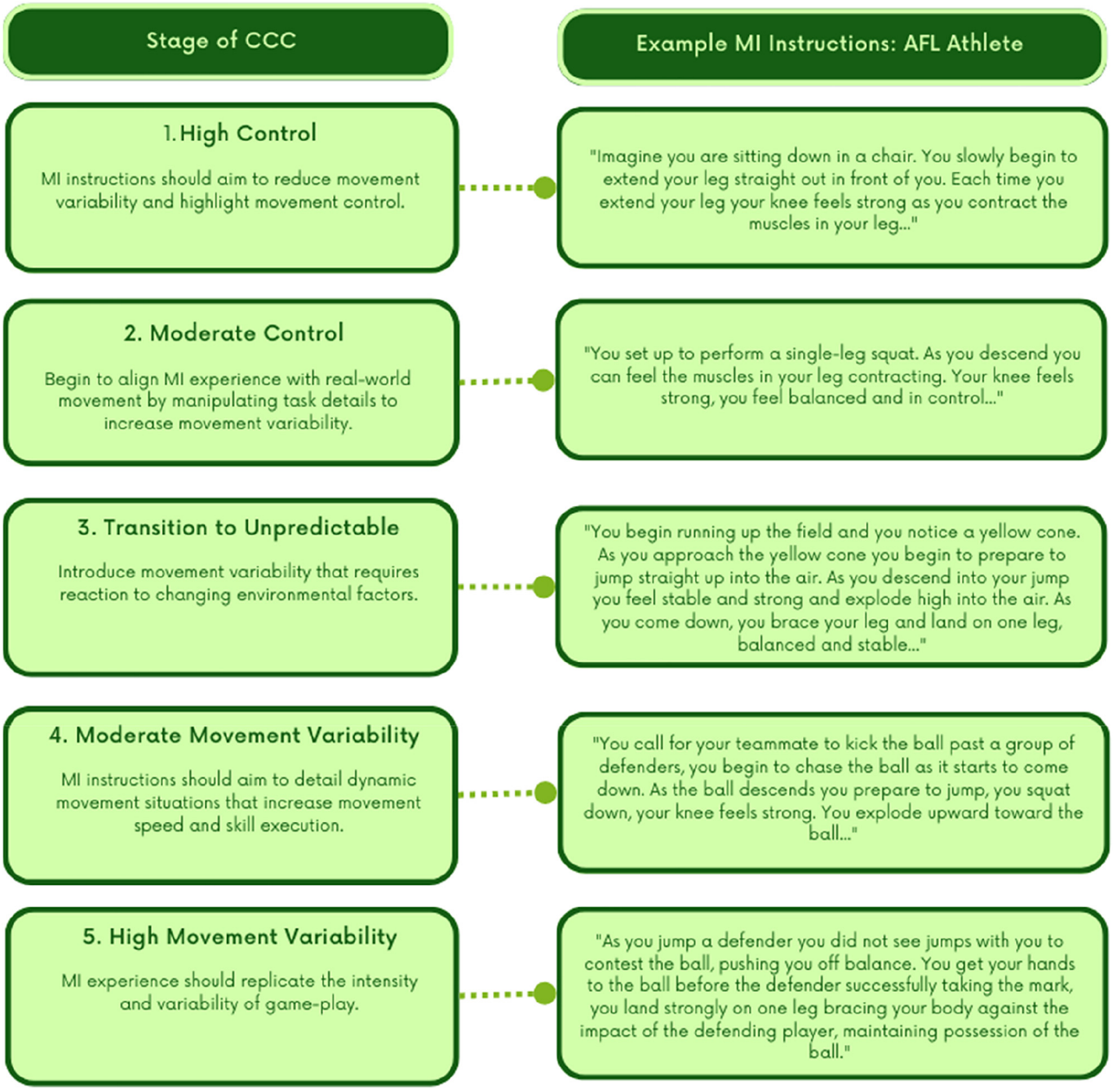

Figure 1: Exemplar of the integration of CCC into MI instructions for an Australian Rules Football player rehabilitating from an ACL reconstruction (Adapted from [36]).

effectiveness of mental imagery for reducing fear of re-injury in athletic populations in a wider variety of injury types. The majority of studies investigating MI and fear of re-injury have focused on lower limb injuries, specifically ACL reconstruction [9, 11], therefore, the impact of MI on upper limb injuries and fear of -re-injury is relatively unknown. A second area of future research would be to identify "critical periods" of the CCC in which performers are at most risk of negative psychological outcomes. Previous research suggests that fear of re-injury becomes the prominent emotional response closer to full recovery [5, 15]. This may be the result of increased movement difficulty, where the risk of re-injury is perceived to be greater and the belief to perform such movements is reduced. Therefore, a fruitful line of inquiry would be to investigate the efficacy of an individualised MI approach that focuses on how to successfully transition performers between different stages of the CCC model to facilitate positive changes to mental well-being.

Conclusions

The aim this article was to outline potential benefits of MI in reducing fear of re-injury and discuss considerations in the development and delivery of MI interventions to reduce fear of re-injury in rehabilitation contexts. Injury is a risk of participation in sport and exercise and return to sport and exercise involves both physical and psychological rehabilitation and recovery, with fear of re-injury a mental health barrier in that process. Psychological strategies to support the athlete's mental health through fear of re-injury, such as MI may be appropriate in supporting physical rehabilitation of an injury. MI could support fear of re-injury concerns through cognitive reappraisal, enhanced self-efficacy, and increased muscular activation. In returning to sport and exercise the athlete has to believe they can successfully perform risky movements, and overcome fear, in using of the injured area in increasingly complex and challenging ways. Adapting both physically and psychologically to increasing movement variability is critical in coping with the return to sport and exercise and MI may provide a safe exposure to increased movement variability for the athlete to manage fear of re-injury concerns as part of the rehabilitation process. Increasing movement variability in MI for fear of re-injury could be modelled on ecological dynamics and CLA to skill acquisition using rehabilitation in sport models such as CCC, which outlines a progressive and gradual increase in movement variability in return to sport. Further research is required to explore how introducing movement variability progressively through MI may support the mental health of the athlete in the managing fear of re-injury in return to sport and exercise.

Research ethics: Not applicable.
Informed consent: Not applicable.
Author contributions: The authors have accepted responsibility for the entire content of this manuscipt and approved its submission.
Competing interests: The authors state no conflict of interest.
Research funding: None declared.
Data availability: Not applicable.

References

1. Claudia LR, Brian H, Cindy Miller A, David B, Antonia LB, Abhinav B, et al. Mental health in elite athletes: international Olympic Committee consensus statement (2019). Br J Sports Med 2019;53:667.
2. Margot P. The psychological response to injury in student athletes: a narrative review with a focus on mental health. Br J Sports Med 2016; 50:145.
3. Australian Football League (AFL). AFLW injury reports 2022. AFL; 2022. https://www.afl.com.au/aflw/news/1001933/2022-aflw-injury-reports/.
4. Medvecky MJ, Nelson S. Kinesiophobia and return to sports after anterior cruciate ligament reconstruction. Conn Med 2015;79:155–7.
5. Brewer BW. The role of psychological factors in sport injury rehabilitation outcomes. Int Rev Sport Exerc Psychol 2010;3:40–61.
6. Ardern C, Webster K, Taylor N, Feller J. Return to sport following anterior cruciate ligament reconstruction surgery: a systematic review and meta-analysis of the state of play. Br J Sports Med 2011;45:596.
7. Hsu CJ, Meierbachtol A, George SZ, Chmielewski TL. Fear of reinjury in athletes. Sports Health 2017;9:162–7.
8. Rogers DL, Tanaka MJ, Cosgarea AJ, Ginsburg RD, Dreher GM. How mental health affects injury risk and outcomes in athletes. Sports Health 2023:19417381231179678. https://doi.org/10.1177/19417381231179678.
9. Rodriguez RM, Marroquin A, Cosby N. Reducing fear of reinjury and pain perception in athletes with first-time anterior cruciate ligament reconstructions by implementing imagery training. J Sport Rehabil 2019;28:385–9.
10. Ong NC, Chua JH. Effects of psychological interventions on competitive anxiety in sport: a meta-analysis. Psychol Sport Exerc 2021;52:101836.
11. Pastora-Bernal JM, Estebanez-Pérez MJ, Lucena-Anton D, García-López FJ, Bort-Carballo A, Martín-Valero R. The effectiveness and recommendation of motor imagery techniques for rehabilitation after anterior cruciate ligament reconstruction: a systematic review. J Clin Med 2021;10:428.
12. Callow N, Hardy L, Hall C. The effects of a motivational general-mastery imagery intervention on the sport confidence of high-level badminton players. Res Q Exerc Sport 2001;72:389–400.
13. Callow N, Waters A. The effect of kinesthetic imagery on the sport confidence of flat-race horse jockeys. Psychol Sport Exerc 2005;6:443–59.
14. Morris T, Spittle M, Watt AP. Imagery in sport. Champaign, IL: Human Kinetics; 2005.
15. Brewer BW. Psychology of sport injury rehabilitation. Handbook of sport psychology, 3rd ed. Hoboken, NJ, US: John Wiley & Sons, Inc.; 2007:404–24 pp.
16. Tripp DA, Stanish W, Ebel-Lam A, Brewer BW, Birchard J. Fear of reinjury, negative affect, and catastrophizing predicting return to sport in recreational athletes with anterior cruciate ligament injuries at 1 year postsurgery Sport Exerc. Perform. Psychol 2011;1:38–48.
17. Wiese-Bjornstal DM, Smith AM, Shaffer SM, Morrey MA. An integrated model of response to sport injury: psychological and sociological dynamics. J Appl Sport Psychol 1998;10:46–69.
18. Chmielewski TL, George SZ. Fear avoidance and self-efficacy at 4 weeks after ACL reconstruction are associated with early impairment resolution and readiness for advanced rehabilitation. Knee Surg Sports Traumatol Arthrosc 2019;27:397–404.
19. Müller S, Gabbett T, McNeil D. Reducing injury risk and improving skill: how a psycho-perceptual-motor approach can benefit high-performance sport. Sports Health 2023;15:315–7.
20. Gledhill A, Forsdyke D. Seeing is believing: the role of imagery in sports injury rehabilitation. In: Gledhill A, Forsdyke D, editors. The psychology of sports injury: from risk to retirement, 1st ed. Routledge; 2021:117–25 pp.
21. Lindsay R, Spittle S, Spittle M. Considering the need for movement variability in motor imagery training: implications for sport and rehabilitation. Front Psychol 2023;14. https://doi.org/10.3389/fpsyg.2023.1178632.
22. Simonsmeier BA, Andronie M, Buecker S, Frank C. The effects of imagery interventions in sports: a meta-analysis. Int Rev Sport Exerc Psychol 2021;14:186–207.

23. Lindsay RS, Larkin P, Kittel A, Spittle M. Mental imagery training programs for developing sport-specific motor skills: a systematic review and meta-analysis. Phys Educ Sport Pedagog 2021;28:1–22.
24. Lindsay RS, Oldham AR, Drinkwater EJ, Spittle M, Storey AG. Effects of personalised motor imagery on the development of a complex weightlifting movement. Int J Sport Exerc Psychol 2022;20:57–78.
25. McNeil DG, Spittle M, Thorsteinsson EB. Effect of task complexity on ipsilateral motor response programming to physically presented and imagined stimuli. Q J Exp Psychol 2020;74:760–70.
26. Kouali D, Hall C, Deck S. Examining the effectiveness of an imagery intervention in enhancing athletes' eudaimonic well-being. J Imagery Res Sport Phys Activ 2020;15:20200003.
27. Kiley KA, Sehgal AR, Neth S, Dolata J, Pike E, Spilsbury JC, et al. The effectiveness of guided imagery in treating compassion fatigue and anxiety of mental health workers. Soc Work Res 2018;42: 33–43.
28. Cupal DD, Brewer BW. Effects of relaxation and guided imagery on knee strength, reinjury anxiety, and pain following anterior cruciate ligament reconstruction. Rehabil Psychol 2001;46:28.
29. Lebon F, Guillot A, Collet C. Increased muscle activation following motor imagery during the rehabilitation of the anterior cruciate ligament. Appl Psychophysiol Biofeedback 2012;37:45–51.
30. Maddison R, Prapavessis H, Clatworthy M, Hall C, Foley L, Harper T, et al. Guided imagery to improve functional outcomes post-anterior cruciate ligament repair: randomized-controlled pilot trial. Scand J Med Sci Sports 2012;22:816–21.
31. Moran A, O'Shea H. Motor imagery practice and cognitive processes. Front Psychol 2020;11:394.
32. Murphy TH, Corbett D. Plasticity during stroke recovery: from synapse to behaviour. Nat Rev Neurosci 2009;10:861–72.
33. Munroe-Chandler K, Hall C, Fishburne G. Playing with confidence: the relationship between imagery use and self-confidence and self-efficacy in youth soccer players. J Sports Sci 2008;26:1539–46.
34. Button C, Seifert L, Chow JY, Davids K, Araujo D. Dynamics of skill acquisition: an ecological dynamics approach. Champaign, IL: Human Kinetics Publishers; 2020.
35. Renshaw I, Davids K, Newcombe D, Roberts W. The constraints-led approach: principles for sports coaching and practice design. London: Routledge; 2019.
36. Taberner M, Allen T, Cohen DD. Progressing rehabilitation after injury: consider the 'control-chaos continuum'. Br J Sports Med 2019;53:1132.
37. Vlaeyen JW, Kole-Snijders AM, Boeren RG, Van Eek H. Fear of movement/(re) injury in chronic low back pain and its relation to behavioral performance. Pain 1995;62:363–72.