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## Literature Review

## A review of return to sport concerns following injury rehabilitation: Practitioner strategies for enhancing recovery outcomes

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## ABSTRACT

**Objectives:** Evidence suggests that competitive athletes returning to sport following injury rehabilitation may experience a range of psychosocial concerns. The purpose of this paper is to review some of the psychosocial stresses common among returning athletes and to provide practitioner strategies for enhancing recovery outcomes.

**Evidence Acquisition:** Findings are based on a database search of Sport Discus, Psychinfo, and Medline using sport injury, fear of re-injury, return to full activity.

**Results:** Salient apprehensions among athletes' returning to sport following injury were found to include: anxieties associated with re-injury; concerns about an inability to perform to pre-injury standards; feelings of isolation, a lack of athletic identity and insufficient social support; pressures to return to sport; and finally, self-presentational concerns about the prospect of *appearing* unfit, or lacking in skill in relation to competitors.

**Conclusions:** The results suggest that athletes returning to sport from injury may experience concerns related to their sense of competence, autonomy and relatedness. Given its focus on competence, autonomy and relatedness issues, self-determination theory (SDT) is offered as a framework for understanding athlete concerns in the return to sport from injury. Practical suggestions for sport medicine practitioners, researchers and applied sport psychology specialists seeking to address athlete issues are provided using an SDT perspective.

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Although an athletic injury is clearly a physical event, researchers have documented the profound psychosocial impact that injury can have on competitive athletes (Brewer, 2007). Researchers and practitioners have argued that in order to ensure holistic injury recovery, both the physical and psychosocial aspects of injury need to be addressed (Bauman, 2005; Crossman, 1997). A range of psychosocial variables such as life stress, motivation, and social support may impact an injured athlete's well-being, rehabilitation progress, and the return to sport following injury (Wiese-Bjornstal, Smith, Shaffer, & Morrey, 1998). Over the past several years, the return to sport following injury rehabilitation has become an area of increasing research interest (Walker, Thatcher, Lavallee, & Golby, 2004). Despite the aim to return to competition, many athletes often struggle with the uncertainties associated with such a return (Taylor, Stone, Mullin, Ellenbecker, & Walgenbach, 2003). As a result, focusing on the concerns of athletes during this recovery phase warrants serious consideration. In order to better address the

range of factors that an athlete may have to deal with when returning to sport following injury, it is imperative that sport medicine practitioners become knowledgeable about the typical psychological challenges among returning athletes.

The aim of this paper is to review some of the psychosocial stresses and anxieties common among athletes returning to sport following injury rehabilitation. We note that the review is not exhaustive in examining all potential concerns among returning athletes (e.g., financial uncertainties associated with medical/rehabilitation costs) but focuses on common issues highlighted in previous research. A particular focus is devoted to a prominent and potentially problematic source of apprehension, re-injury anxiety. In order to understand and explain athlete concerns, a theoretical framework—self-determination theory—will be outlined (Podlog & Eklund, 2007a). The paper will highlight the key assumptions of self-determination theory (SDT) and discuss its' relevance in understanding and bringing coherence to the diverse findings regarding athletes' return-to-sport experiences and areas of concern. Finally, SDT will be used as a framework for providing suggestions for sport medicine practitioners aiming to address the psychological stresses among injured athletes under their care.

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## 1. The nature of athlete concerns upon a return-to-sport following injury

A range of psychological worries among injured athletes on the verge of a return to sport has been documented (Kvist, Ek, Sporrstedt, & Good, 2005; Podlog & Eklund, 2007a). Athletes approaching a return to sport often experience anxieties associated with re-injury (Kvist et al., 2005; Williams & Roepke, 1993); concerns about an inability to perform to pre-injury standards (Podlog & Eklund, 2006; Taylor & Taylor, 1997); feelings of isolation (Messner, 1990); a lack of athletic identity (Brewer, Van Raalte, & Linder, 1993; Curry, 1993) and insufficient social support (Johnston & Carroll, 1998; Udry, Gould, Bridges, & Tuffey, 1997). Moreover, pressures to return to sport from coaches, teammates, family members or from athletes themselves may be prevalent (Bauman, 2005). Finally, self-presentational concerns about the prospect of an athlete *appearing* unfit, incompetent or lacking in skill may influence the quality and nature of athletes' return to sport experiences (Podlog & Eklund, 2006). Although some of these concerns are likely to be interrelated, they will be discussed in individual sections below.

### 1.1. Re-injury anxiety

Previous investigations have documented the existence of re-injury concerns as athletes get closer to returning to sport (Bianco, 2001; Cox, 2002; Evans, Hardy, & Fleming, 2000; Gould, Udry, Bridges, & Beck, 1997; Kvist et al., 2005; Podlog & Eklund, 2006; Taylor & Taylor, 1997; Walker et al., 2004; Williams & Roepke, 1993). Although empirical investigation examining the consequences of re-injury anxiety is still in its infancy, researchers have suggested that re-injury anxieties may prevent otherwise healthy athletes from ever returning to sport (Heil, 1993). Kvist et al. (2005) found that re-injury anxiety represented a substantial hindrance for returning to sport of otherwise healthy athletes who had received medical clearance to return.

Re-injury anxieties may also increase the likelihood of actual re-injury (Heil, 1993; Taylor & Taylor, 1997). Williams and Andersen (1998) proposed a stress-injury model to explain potential mechanisms by which stress and anxiety increase the likelihood of injury. This model posits that when placed in a stressful situation, an athlete's appraisal of a psychological stress or threat may lead to muscular fatigue, reduced timing and diminished coordination, all of which may increase the likelihood of injury. Perceptions of threat are also thought to create attentional disruptions which narrow peripheral vision and increase distractibility that may also increase the risk of injury. Athletes with high life stress, heightened competitive anxiety, and poor coping resources are at a greater risk for neuromuscular and attentional changes associated with increased injury occurrence when placed in a potentially stressful situation (Johnson, Ekengren, & Andersen, 2005). Empirical research supports the notion of an "at-risk" injury profile in which the aforementioned risk factors operate in a conjunctive fashion to increase the likelihood of injury (Johnson et al., 2005).

Researchers have also suggested that re-injury anxieties may negatively impact athletes' post-injury performances. In a longitudinal investigation, Carey, Huffman, Parekh, and Sennett (2006) found that NFL players' performance decreased after a return to sport following a serious knee injury. Running backs and wide receivers exhibited a 33% drop in rushing and receiving yards as well as touchdowns on their return. Although the researchers proposed several suggestions such as loss of strength, de-conditioning, and reduced proprioception, an alternate explanation may be that re-injury anxieties influenced athletes' attentional focus and created a sense of hesitation. It is likely that appraisals of stress

and uncertainty regarding the possibility of re-injury or diminished post-injury performance may cause similar attentional and neuromuscular changes that serve to increase the chance of actual re-injury.

Current research (Bianco, 2001; Evans et al., 2000; Gould et al., 1997; Kvist et al., 2005) and anecdotal evidence suggest that re-injury anxieties are a concern that should be addressed by sport medicine practitioners. Ensuring that otherwise healthy athletes do not cease their sport participation because of re-injury anxieties or that such concerns do not increase the likelihood of re-injury or diminished post-injury performance is an important task for sport medicine practitioners to consider. Common indications that an athlete may be experiencing re-injury anxieties include heightened negative emotionality at the completion of rehabilitation, malingering efforts that delay rehabilitation progress or hesitation in trying sport specific drills and tests of which an athlete is physically capable (Heil, 1993). The final section provides suggestions for minimizing the salience of this potentially deleterious concern.

### 1.2. An inability to perform to pre-injury standards

A second source of trepidation reported among high performance athletes relates to uncertainties about the ability to reach pre-injury levels and achieve future aspirations. This stress source typically stems from the fact that athletes may have been unable to perform their skills for a prolonged period of time (Podlog & Eklund, 2007b), a loss of physical fitness (Tracey, 2003), the fact that other athletes improved during one's competitive absence (Taylor et al., 2003), or the possible effects of injury on the technical aspects of one's performance (see Fig. 1) (Bianco, 2001). Such concerns are not surprising given athletes' desire to reach their physical capacities and perform at the highest level of competition. What remains unclear is how long concerns about performing to pre-injury levels persist following the return to full activity. Studies with injured rugby players (Cox, 2002; Evans et al., 2000) and a range of elite Australian performers (Podlog & Eklund, 2006) suggest that uncertainties about regaining pre-injury levels typically dissipate within the first six months of the return to sport as athletes have the opportunity to experience successful performance of their physical skills. These findings highlight the importance of providing graduated opportunities for athletes to perform and experience success in the performance of physical skills as a form of confidence building in the return to sport.

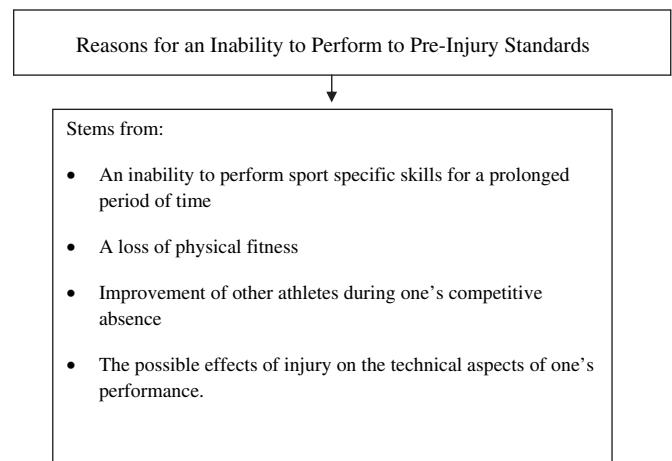


Fig. 1. Reasons for an inability to perform to pre-injury standards.

### 1.3. Feelings of isolation, a lack of athletic identity and insufficient social support

Athletes returning to sport from injury have reported feelings of isolation, a lack of athletic identity and feeling unsupported in the recovery and return to sport phases. Feelings of disengagement and isolation from coaches, teammates, and training partners may occur as recovering athletes become removed from their usual training and competition venues and spend more time in rehabilitation settings (Gould et al., 1997). A sense of alienation from one's own body which can no longer perform the necessary tasks required to compete may also negatively impact athletes' state of mind in the injury recovery and the return to sport phases (Ermler & Thomas, 1990; Thomas & Rintala, 1989). Moreover, injured athletes have consistently reported concerns about maintaining their athletic identities given their feelings of social dislocation from teammates, coaches and training partners during injury recovery (Bianco, 2001; Gould et al., 1997).

Inadequate levels of social support have also been documented (Johnston & Carroll, 1998; Udry et al., 1997). For example, athletes in Udry et al.'s (1997) study indicated that they perceived their coaches to be distant and insensitive to injury, did not provide sufficient or appropriate rehabilitation guidance, nor demonstrated a belief in them. Similarly, athletes in a later investigation indicated a lack of (informational) support from coaches and physiotherapists as they were re-initiating their athletic participation (Johnston & Carroll, 1998). Furthermore, athletes reported receiving insufficient advice, guidance and information from their coaches about how to train or build up their muscles as they re-entered the competitive arena (Johnston & Carroll, 1998). Such findings contradict substantial evidence of the benefits of social support for athletes' returning to sport following injury (Bianco & Eklund, 2001). Social support from coaches, family members and medical practitioners may be essential in assisting athletes in dealing with the demands of injury recovery and complying with the rigors of their rehabilitation regimen (Johnston & Carroll, 1998). Greater compliance has been shown to increase the likelihood of enhanced clinical outcomes such as proprioception, range of motion, joint/ligament stability, muscular strength and endurance as well as reductions in the subsequent risk of re-injury (Brewer, 2007).

### 1.4. Pressures to return to sport

Another common injury related challenge reported by both athletes and coaches is the issue of pressures to return to sport. Competitive athletes and those displaying a high level of sport commitment often face external pressures from coaches, teammates, or training partners to return to sport after an injury before they are physically or mentally ready (Bauman, 2005; Bianco, 2001; Charlesworth & Young, 2004; Murphy & Waddington, 2007). Charlesworth and Young (2004) found that English female university athletes experienced pressure to return from significant others, in particular coaches and peers. This pressure influenced athletes' decisions to play while in pain or to return prematurely from an injury. Bauman (2005) argued that in recent years elite athletes have been under increasing pressure to make an expedited return to sport following injury. He suggested that health care providers and sport organizations require an awareness of this pressure in order to ensure athletes are medically and physically prepared for a return to full activity.

A recent investigation (Podlog & Dionigi, in press) revealed that coaches possessed a clear awareness of how time pressures to be ready for particular competitions influenced athlete perceptions of where they felt they *should* be in relation to the competition

calendar. Interestingly, coaches indicated that time pressures to return to sport were often self-induced. In many cases, athletes may shorten their recovery due to an increasing lack of confidence in their ability to perform their skills, concerns about feelings of isolation, or concern that they are losing too much fitness. From a practical standpoint, coaches, managers and sport medicine practitioners need to be aware of athlete tendencies towards self-imposed pressures to return to sport in order for appropriate intervention efforts to be taken.

### 1.5. Self-presentational concerns in the return to sport from injury

A final concern relates to self-presentation issues surrounding a return to sport from injury. As humans engage in social interaction, they typically aim to make desired impressions of themselves in the minds of others. This awareness of the impression made on others often leads to "impression management" efforts (Leary, 1992). Because injured athletes may not have demonstrated their skills for a prolonged period, concerns about the prospect of appearing unfit, unskilled or not as good as one once was are not surprising. An investigation of high level athletes revealed self-presentational concerns of not meeting other's performance expectations, letting down teammates or the coach, and concerns over upholding one's reputation (Podlog & Eklund, 2006). These concerns appeared more pronounced among athletes who were particularly aware of coaches', fans' and teammates' interest in their upcoming performances (Podlog & Eklund, 2006).

Although research on the self-presentational concerns of injured athletes is relatively new, it appears that such concerns may impact upon the quality of athletes' experience in re-entering the competitive arena. Further research is needed to examine the extent to which formerly injured athletes returning to sport experience self-presentational concerns in relation to their non-injured counterparts and whether heightened self-presentational concerns are associated post-injury performance decrements or re-injury.

## 2. Toward a self-determination perspective on the return to sport from injury

The aforementioned findings suggest that athletes may experience concerns regarding three key areas including: their sense of competence, relatedness or affiliation, and autonomy (Podlog & Eklund, 2007b). Re-injury anxieties, concerns over reaching pre-injury levels, "falling behind" competitors, and concerns over diminished post-injury performances, all relate to athletes' desire to maintain high levels of athletic competence. Insecurities regarding the prospect of *appearing* unskilled, unfit or "foolish" suggest that self-presentational concerns may be rooted in competence based preoccupations. For high level athletes committed to the development of their physical competencies, the possibility that injury may interfere with their return performance may be a daunting and unwanted outcome. In short, it is apparent that competence related concerns might be at the forefront of athletes' minds as they re-enter the competitive arena.

Researchers have also found that injured athletes experience feelings of isolation from teammates, training partners and coaches as well as alienation from their own bodies. For many injured athletes, maintaining a sense of belonging and feeling part of the team (i.e., a sense of relatedness) may be beneficial, particularly among athletes with a high athletic identity. Indeed, social support from coaches, teammates and significant others may provide a buffer against feelings of alienation and isolation. Collectively, these findings suggest that relatedness or affiliation concerns may be important among athletes returning to sport following injury.



Finally, external and internal pressures to return to sport may be prevalent, thus highlighting the relevance of autonomy issues among returning athletes. While some athletes are given autonomy to return at their own pace, others may experience pressures from coaches, teammates and significant others to compete in particular competitions (Podlog & Eklund, 2006). Still other athletes may place internal pressures upon themselves to meet personal standards of excellence and to be prepared for certain competitions. These findings reveal that athletes may experience differing degrees of autonomy regarding the circumstances of their injury recovery and return to sport.

### 3. Self-determination theory and the return to sport from injury

Due to the focus on competence, autonomy and relatedness issues, self-determination theory (SDT) appears to be a useful theoretical perspective for understanding and explaining athlete return-to-sport experiences and as a framework for guiding intervention efforts (Podlog & Eklund, 2007b). Self-determination theory is a motivational theory that examines the socio-environmental factors influencing an individual's tendency towards self-motivated behavior, psychological health and well-being, and task related performance. According to Ryan and Deci (2000), all individuals have three basic psychological needs: competence, relatedness and autonomy. When these needs are satisfied psychosocial functioning, personal development and task performance will be enhanced. However, if they are thwarted an athlete may experience apathy, alienation, and heightened stress and anxiety. Research across a variety of life domains including: work (Gagné & Deci, 2005), family (Grolnick, Deci, & Ryan, 1997), education (Miserandino, 1996), and sport (Gagné, Ryan, & Bargmann, 2003) support SDT contentions regarding the beneficial effects of need satisfying environments.

From the self-determination perspective, the extent to which injured athletes experience fulfillment of their three psychological needs will have important motivational, performance and anxiety related implications for their rehabilitation and return to sport. A recent investigation tested the notion that satisfaction of athletes' psychological needs (i.e., competence, relatedness and autonomy) would be associated with enhanced psychological well-being indicators (i.e., positive affect, self-esteem and vitality) as well as more positive return-to-sport outcomes (e.g., enhanced motivation for sport success, increased mental toughness) (Podlog, Lochbaum, & Stevens, 2010). Results indicated that fulfillment of athletes' competence needs during their rehabilitation was associated with greater positive affect and vitality which partially predicted positive return-to-sport outcomes. Furthermore, satisfaction of relatedness needs such as social support from coaches was positively associated with higher vitality and self-esteem which diminished return to sport concerns such as reduced competitive and re-injury anxieties.

It is apparent that returning athletes' experience competence (e.g., re-injury anxieties, concerns about performing to pre-injury standards), autonomy (external and self-induced pressures to return to sport) and relatedness (e.g., feelings of social isolation and a lack of social identity) issues. Self-determination theory based research (Podlog & Eklund, 2006; Podlog & Eklund, 2007a) also reveals that environments that satisfy athletes' competence, autonomy and relatedness needs may be instrumental in reducing athlete anxieties and concerns regarding the return to sport. Sport medicine practitioners, aiming to ensure athletes' holistic recovery, would therefore be well advised to address these areas during recovery. The following section provides practical suggestions and strategies for addressing competence, relatedness and autonomy needs among athletes returning to sport following injury.

### 4. Intervention strategies

A range of evidence-based interventions have proven effective in addressing athlete concerns regarding competence, autonomy and relatedness issues (see Fig. 2). Although there is no space here to provide an in-depth description of each strategy, the interested reader is encouraged to explore the references provided below in further detail.

### 5. Meeting athletes' competence needs

- 1) *Address re-injury anxieties.* Previous research has shown relaxation, imagery and modeling techniques to be successful in reducing re-injury anxieties and building athlete confidence (Cupal & Brewer, 2001). Various modeling, relaxation and imagery techniques can be implemented with athletes in the context of a rehabilitation visit. For example, while athletes receive ultra-sound, massage, muscle stimulation or ice-bath treatments they may watch videos of formerly injured athletes who discuss how they successfully overcame their re-injury anxieties. Similarly, athletes can be paired with another athlete who is proficient in certain rehabilitation exercises so the less experienced athlete can learn and model how to execute the rehabilitation exercises correctly (Flint, 2007). Such models may enhance rehabilitation motivation and reinforce the belief that 'if others can do it, so can I.' Providing models may also foster athletes' sense of relatedness and diminish feelings of isolation. Relaxation techniques such as deep breathing techniques and progressive muscular relaxation may be useful in reducing stress and promoting blood flow to the injured limb, thus promoting healing and reducing the likelihood of re-injury (Heil, 1993). Relaxation paired with imagery exercises can also be used to enable injured athletes to see themselves performing without hesitation or re-injury anxiety (Flint, 2007; Green & Bonura, 2007; Walker et al., 2004; Williams, 2006). Athletes who struggle to achieve appropriate pre-imagery relaxation levels or those who struggle with the clarity and/or controllability of their injury related images may require referral to a sport psychologist.
- 2) *Build confidence in performance capabilities.* Attaining physical levels of proficiency and achieving pre-injury fitness levels are two essential sources of confidence information for athletes returning to sport following injury rehabilitation (Podlog & Eklund, 2006). Therefore, providing a range of progressive functional tests for proprioception, muscular strength and endurance as well as overall fitness will provide athletes with concrete information that they are ready to perform at a high level. Furthermore, providing sufficient advice, guidance and post-injury training and education regarding sport specific exercises may enhance athlete confidence during the re-entry period. Ensuring athletes are clear about how to build the muscles surrounding the formerly injured limb can foster perceptions of success in the initial return to sport. Lastly, setting realistic and attainable performance goals has been demonstrated to improve athlete self-belief and confidence in their ability to achieve their full post-injury potential (Cox, 2002; Evans & Hardy, 2002; Evans et al., 2000; Gilbourne, Taylor, Downie, & Newton, 1996). Sport medicine practitioners need to ensure that goals are specific, measurable, action oriented, realistic, time-based, and self-determined (i.e., personally endorsed) (SMARTS principle) in order to optimize goal-setting effectiveness (Smith, 1994). Ensuring that athletes have input, involvement and choice in determining their personal recovery goals will enhance the likelihood that athletes fully support and comply with their rehabilitation

## Return-to-Sport Concerns among Injured Athletes and Associated Prevention/Intervention Strategies

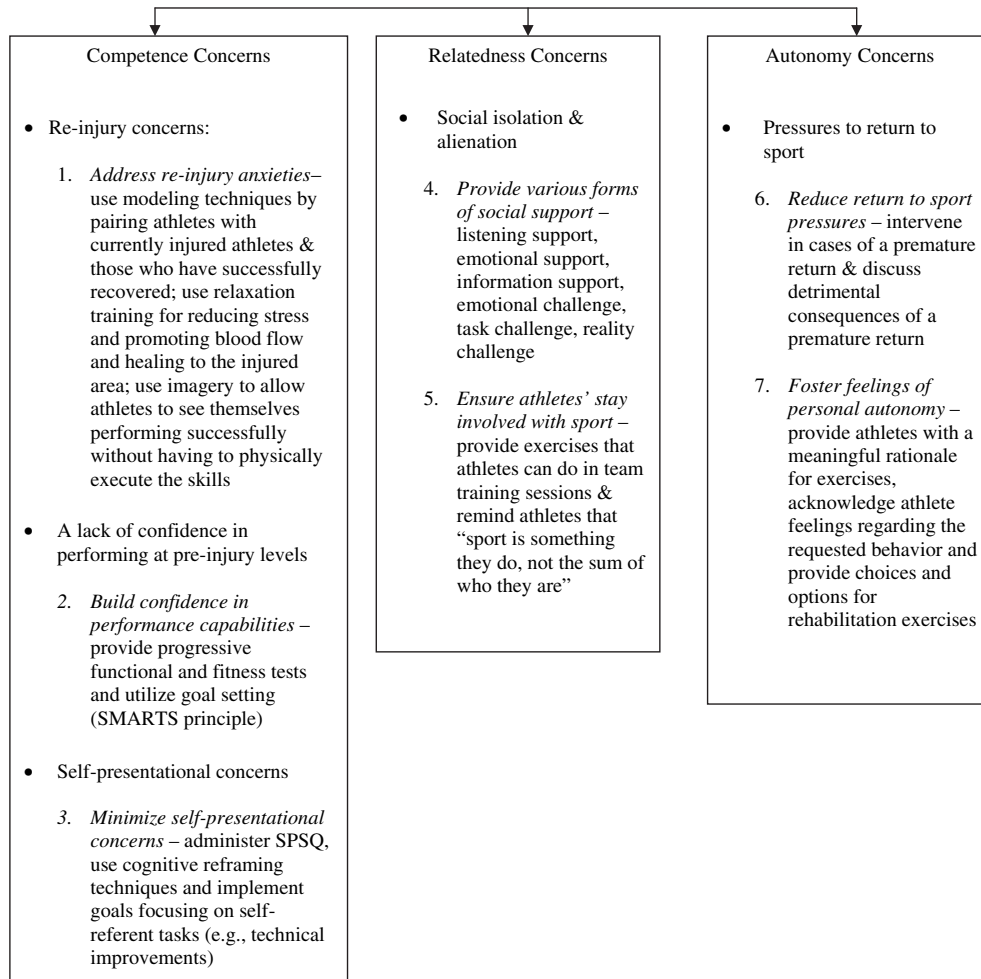


Fig. 2. Return-to-sport concerns among injured athletes and associated prevention/intervention strategies.

goals. Enhancing the effectiveness of the goal-setting process may be instrumental in increasing athlete confidence regarding the return to sport (Evans et al., 2000).

- 3) *Minimize the influence of self-presentational concerns.* A quick method for assessing the extent to which injured athletes experience self-presentational concerns is to administer the Self-Presentation in Sport Questionnaire (SPSQ) (Wilson & Eklund, 1998). The questionnaire addresses concerns about performance/composure inadequacies (10 items), appearing fatigued/lacking energy (10 items), physical appearance (6 items), and appearing athletically untalented (7 items), all of which may be salient among athletes returning from injury. The questionnaire can be easily administered, scored and analyzed by sport medicine professionals. Should injured athletes present with high levels of self-presentational doubts these concerns may be minimized through cognitive reframing which is a process of creating alternative frames of reference or different ways of assessing a situation (Gauron & Wood, 1984). Sport medicine practitioners may help injured athletes reframe their perspective by shifting their focus onto the intrinsic reasons for their sport involvement such as “a love of the game”, personal feelings of satisfaction in learning new skills, the thrill and excitement of one’s sport participation, and the social benefits of sport involvement. An example script for

sport medicine practitioners aiming to assist injured athletes with cognitive restructuring techniques is provided in Fig. 3. Goal setting techniques may also be beneficial in minimizing the salience of self-presentational concerns. Focusing on process or task related goals (e.g., technical adjustments or particular times on fitness tests) that are self-referent in nature and under the control of the athlete may be useful towards this end. Lastly, self-presentational concerns may be minimized by ensuring athletes’ satisfaction of the self-determination needs. Athletes who feel competent, who are provided with a strong relational base (i.e., connected to others), and who feel volitional (i.e., autonomous) in their return to sport may be less likely to experience self-presentational concerns.

## 6. Meeting athletes’ relatedness or affiliation needs

- 4) *Provide various forms of social support.* Social support has assisted athletes in coping with injury related challenges and in offsetting the potentially alienating and isolating aspects of the injury experience (Bianco, 2001; Johnston & Carroll, 1998). Rehabilitation specialists may be ideally situated to provide athletes with various forms of social support because of their regular contact with injured athletes. Social support may include listening to

*I know that you may be concerned about appearing fatigued, unskilled or lacking in composure when you return to competition. It's perfectly normal to have concerns. One suggestion I have is that any time you find yourself worrying or stressed about what others think of your performance, try replacing your negative thoughts with more positive ones. For instance, when negative thoughts enter your head, you might tell yourself "stop" or "enough" and reframe these thoughts into more positive statements.*

Example 1:

Negative athlete statement - *"I'm concerned that I may let my teammates down if my fitness isn't what it used to be."*

Replace with...

Positive athlete statement - *"Stop. I've worked hard in rehabilitation to get my fitness to where it is and it will only continue to improve with time. Ultimately, what counts is that I get to do something I love and I'm excited to play again."*

Example 2:

Negative athlete statement - *"I'm worried about what the coach (or others) will think if my skills and ability aren't as good as before the injury."*

Replace with...

Positive athlete statement - *"Enough. What the coaches think of my skill level isn't under my control. I know I've been practicing my skills while injured and my technique has only gotten better. It's great that I get to compete again."*

Example 3:

Negative athlete statement - *"I'm worried that I'll lack composure and I won't be in sync with my teammates because I haven't competed for a while."*

Replace with...

Positive athlete statement - *"Stop. I'm excited to be part of the team again and my teammates know I haven't competed for a while. They [my teammates] have been supportive throughout my rehab and are happy that I'm back playing."*

Fig. 3. Cognitive reframing script for sport medicine practitioners working with injured athletes.

athlete concerns, helping athletes deal with the range of negative emotions brought on by the injury experience, and providing athletes with information about what has happened to their body and the steps required to heal. Sport medicine practitioners may also offer social support by challenging the athlete to stay motivated and on task during times of frustration or anger and providing the athlete with positive feedback and progress information. Providing the aforementioned forms of social support may be instrumental in fostering athletes' relatedness needs and facilitating rehabilitation compliance. As indicated above, adherence to rehabilitation exercises may in turn have a positive impact upon functional rehabilitation outcomes such as range of motion, muscular strength and post-injury performance (Brewer, 2007).

- 5) *Ensure athletes' stay involved with sport.* Encouraging athletes to partake in team activities or training sessions should be encouraged as a means of fostering athletes' relatedness needs. As a caveat, it is important to ensure that athletes participate in training activities to the extent they are capable as to not experience frustration in simply watching others compete (Tracey, 2003). Sport medicine practitioners should also remind athletes that "sport is what you do, not who you are" as a means of reducing athletic identity concerns. Encouraging

athletes to pursue non-sport activities that provide them personal meaning and enjoyment may be useful in reducing athletic identity concerns while injured (Brewer et al., 1993).

## 7. Meeting athletes' autonomy needs

- 6) *Reduce return to sport pressures.* Intervening on athletes' behalf in instances where it is apparent that they may be receiving pressures to return is essential. Sport medicine practitioners may have to limit athlete involvement in training/competition where it is evident that the athlete may be imposing self-induced pressures to return prematurely. Discussions with athletes, coaches and family members regarding the detrimental consequences of a pre-mature return such as the risk of re-injury or poor performance may be useful in encouraging athletes to take their time in recovering and returning to full activity.
- 7) *Foster feelings of personal autonomy.* Many rehabilitation exercises essential to full recovery may not be inherently interesting and may even be painful. Providing athletes with a meaningful rationale, while acknowledging their feelings regarding the requested behavior and providing alternative

exercises, will serve to reinforce feelings of autonomy in the recovery process. The greater the extent to which the athlete feels s/he is recovering in order to meet personal aims and objectives, the more likely the athlete is to comply with the rehabilitation program and reduce the likelihood of re-injury concerns (Treasure, Lemyre, Kuczka, Standage, Hagger, & Chatzisarantis, 2007).

## 8. Summary

This paper has examined some of the primary psychological concerns among athletes returning to sport following serious injury. The nature of these stresses revealed that the psychological needs of competence, autonomy and relatedness are significant to athletes returning to competition. Given its focus on these three psychological needs, self-determination theory (SDT) was advocated as a relevant framework for exploring intervention efforts aimed at reducing re-injury concerns. In line with SDT contentions, intervention strategies addressing athletes' psychological needs were proposed. It is intended that these strategies provide sport medicine practitioners with an enhanced knowledge of ways to prevent or reduce the salience of athlete concerns in their return to sport following injury.

## Conflict of interest statement

None of the authors have any financial or personal relationships with other people or organizations that could inappropriately influence (bias) the contents of this work.

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