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ACL Injury Rehabilitation: A Psychological Case Study of a Professional Rugby Union Player

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The aim of this case study was to investigate the emotional factors and coping strategies used by a professional rugby union player during rehabilitation from anterior cruciate ligament (ACL) injury. A dominant (qualitative) – less dominant (quantitative) mixed methodological approach was established concurrent with the athlete's rehabilitation. Twice monthly interviews and a self-report diary were completed throughout the rehabilitation process. Six questionnaires were used to assess specific aspects of injury rehabilitation identified from previous literature, including emotional response, coping, social support, and perceived autonomy. Content analysis of each phase of the rehabilitation process established 34 higher-order themes split into two general dimensions: Influential Emotions or Coping Strategies. Findings highlight the benefit of problem-focused coping to improve autonomy and confidence. A sequential movement through a series of emotions (shock, depression, relief, encouragement, and confidence building) was also identified.

Keywords: athletic injury, coping, emotional response, autonomy

Injury rates among Rugby Union players have increased dramatically over the last decade (Bathgate, Best, Craig, & Jamieson, 2002; Brooks, Fuller, Kemp, & Reddin, 2005). Since the consequences of such injuries and how a player deals with injury are directly related to continuation in and return to sport, investigation regarding the psychological aspects of athletic injury rehabilitation is becoming increasingly important. However, the majority of literature that has focused on injury rehabilitation has concentrated on the medical and physical aspects and until recently has neglected the psychological factors that could potentially play a significant role

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for professional athletes. With some exception, the psychological research to date has mainly concentrated on specific factors that influence an athlete's rehabilitation, such as social support (Bianco, 2001; Udry, 1997); adherence (Duda, Smart, & Tappe, 1989; Pizzari, McBurney, Taylor, & Feller, 2002); self-confidence (Magyer & Duda, 2000); coping (Gould, Udry, Bridges, & Beck, 1997); and psychological skills (Cupal & Brewer, 2001; Ievleva & Orlick, 1991). A limitation of much of this research is that a large percentage has adopted retrospective research designs, thus potentially missing some important information. In particular, retrospective approaches can be influenced by the event outcomes achieved by the athlete and this can lead researchers to draw causal conclusions (Brewer, Van Raalte, Linder, & Van Raalte, 1991). In addition, retrospective approaches can result in athletes' reporting how they *normally* behave rather than how they *actually* behaved in a particular situation (Smith, Leffingwell, & Ptacek, 1999). Finally, memory decay can reduce the accuracy of data collected retrospectively (Ptacek, Smith, Espe, & Rafferty, 1994).

Cognitive appraisal models of injury rehabilitation (Brewer, 1994; Wiese-Bjornstal, Smith, Shaffer, & Morrey, 1998) suggest that individual interpretation of an injury will influence the athlete's cognitive, emotional, and behavioral responses. Gallagher and Gardner (2007) empirically demonstrated that dispositional and situational factors predict emotional responses to sports injury, and specifically, differences in early maladaptive schemas determine different affective responses at various phases of the injury process. Tracey (2003) has further suggested that both primary and secondary appraisals fluctuate depending upon the personal and situational factors of each injured athlete; however, there are significant relationships between primary and secondary appraisals and coping strategies (Albinson & Petrie, 2003). Albinson and Petrie found that unhelpful coping strategies lead to greater stress when injured and propose that the social support provided to an injured athlete should focus on reducing negative appraisals. In general, coping strategies have been separated into three distinct categories: (a) problem-focused, (b) emotion-focused, and (c) avoidance coping (Kowalski & Crocker, 2001). Problem-focused coping relates to concerted efforts to manage a stressful situation, emotion-focused coping is aimed at controlling emotional reactions, and avoidance coping is concerned with activities or cognitive changes to avoid the situation via distraction or social diversion (Endler & Parker, 2000).

Shelley (1999, p. 306) called for further investigation into the "unique perceptions and perspectives" of injured athletes during rehabilitation as a means of adding depth to the research. The use of qualitative data collection on multiple occasions allows injured athletes to reflect on their experiences as they happen and to scrutinize changes over time (Brewer, 1994; Heil, 1993; Podlog & Eklund, 2006; Udry, 1997). Mixed methodological approaches aid the investigation of the specific components associated with the psychology of injury rehabilitation that have been identified within current literature. In particular, relevant factors include emotional response (Tracey, 2003), coping (Gould et al., 1997), social support (Bianco, 2001), and perceived autonomy (Podlog & Eklund, 2005).

Purpose

To date relatively little research has investigated the psychological impact of injury and rehabilitation among professional athletes. Thus, the present case study used a mixed methodological design to longitudinally investigate some psychological aspects associated with rehabilitation from an anterior cruciate ligament (ACL) injury among a professional rugby union player. By investigating coping strategies alongside emotional reactions, the study aimed to provide a more holistic view of cognitive appraisal related to serious sports injury.

Method

Participant

The participant was a current professional rugby union player (henceforth referred to as "Tom," a pseudonym) who ruptured an anterior cruciate ligament (ACL) during a preseason match. He continued to play for the duration of the match and did not realize the extent of his injury until the following evening when after a recovery run, his knee stiffened and he subsequently experienced severe pain. The full diagnosis of Tom's injury did not occur until one month after the initial incident. He was undergoing an MRI scan with the belief that some damaged cartilage would need to be removed. The full extent of his ACL injury was then identified, however, and his physician immediately suggested surgery to reconstruct the damaged ligament. Following reconstructive surgery, Tom spent 11 months in rehabilitation.

Tom had previously suffered from a ruptured posterior cruciate ligament (PCL) on the same knee as the current ACL injury and had missed most of the previous season's competitions. He had successfully returned to competitive action after six months in rehabilitation and had suffered no further problems until the ACL injury occurred. During his ACL reconstruction, it was identified that his PCL had completely healed and no further attention was required for this.

The decision to conduct the case study on a participant undergoing rehabilitation of an ACL injury was made for several reasons. First, ACL injury is common in the sport of Rugby (Brooks et al., 2005). Second, the rehabilitation generally takes a substantial period of time and is known to lead to significant distress among athletes (Pizzari et al., 2005). Third, much of the literature to date has investigated ACL rehabilitation, thus allowing for meaningful comparisons (Brewer et al., 2000; Cupal & Brewer, 2001).

Procedure

The present study was a longitudinal investigation conducted concurrently with the athlete's injury rehabilitation. Following university ethical approval, initial contact was made with the athlete prior to his reconstructive surgery and within two weeks of the identification of the ACL injury. Expanding on research conducted by Shelley

(1999), the methodological procedure was split into six distinct phases of the injury and subsequent rehabilitation. The phases were (a) *initial injury*, which included the actual occurrence of the injury and the diagnosis of the severity of the injury; (b) *presurgery*, which included the days leading up to the surgical reconstruction (including the actual surgery); (c) *postsurgery*, which included the first few days following the reconstruction and the athlete's initial attempts to regain movement within the knee joint; (d) *early limited participation*, which included the early part of the rehabilitation program, with emphases on both regaining the full range of movement in the knee joint and muscle strength; (e) *late limited participation*, which included the final part of the rehabilitation program, with emphases on both sport specific training and the final preparation for full fitness; and (f) *return to play*, which included the final training sessions before returning to competitive action and the first three games of competition after full rehabilitation.

A mixed methodological approach, principally combining qualitative and quantitative methods, was used for this study. This approach consisted of a dominant (qualitative), less dominant (quantitative) design as suggested by Tashakkori and Teddle (1998). Tom was interviewed on a regular basis (every two to three weeks) using a semistructured interview guide (as suggested by Patton, 1990). The interviews focused on his cognitions, emotions, and coping strategies used during his rehabilitation. An interview guide was established for each phase of the rehabilitation process, utilizing the vast range of current research on the subject and the researchers' personal experiences with ACL injury. Each interview lasted an average of 45 minutes and all information was audiotaped and transcribed verbatim.

Tom was also asked to complete a predesigned diary, in which he was instructed to (a) record all day-to-day changes in emotional responses (both positive and negative) and (b) indicate coping strategies used throughout the rehabilitation that related to both the injury itself and life in general. The use of personal documents such as diaries can enable participants to provide detailed personal information that they may be unwilling to discuss in other forums (Fetterman, 1989).

Tom completed six questionnaires at specific times during his rehabilitation to help confirm any significant data that emerged through qualitative data collection methods. The Emotional Responses of Athletes to Injury Questionnaire (ERAIQ; Smith, Scott, O'Fallon, & Young, 1990) was completed immediately after diagnosis of the severity of the injury. The ERAIQ identifies an athlete's emotional responses to injury and is used to assess the injured athlete's psychosocial response to injury. According to Smith et al., "the ERAIQ is a blueprint for the comprehensive assessment of an injured athlete" (1990, p. 23). The Sports Inventory for Pain questionnaire (SIP; Meyers, Bourgeois, LeUnes, & Middendorf, 2003) was completed following the reconstructive surgery. The SIP is a 15-item sport specific measure assessing how athletes cope with pain. Answers on each item are categorized into three groups (Direct Coping, Catastrophizing, and Somatic Awareness). The Coping with Health, Injuries, and Problems inventory (CHIP; Endler & Parker, 2000) was completed in the early stages of the late limited participation phase. The CHIP provides a score for four subscales related to coping (Distraction Coping, Palliative Coping, Instrumental Coping, Emotional Preoccupation), which allows for corroboration of used coping strategies discussed during the interviews. Following a successful return to competition, Tom was asked to complete the MOS Social Support Survey (MOS-SSS; Sherbourne & Stewart, 1991), which allowed

for the identification of various forms of social support (Emotional/Informational Support, Tangible Support, Affectionate Support, Positive Social Interaction) offered during his rehabilitation. The final two questionnaires were both adapted forms of the Sport Climate Questionnaire (part of a group of questionnaires used to identify Perceived Autonomy-Supportive Climates; Deci & Ryan, n.d.). These questionnaires are designed to assess to what degree the climate surrounding the athlete is autonomous or controlling. These final two questionnaires, completed after full rehabilitation, investigated the climate establish by the coach (Sport Climate Questionnaire) and by the physiotherapist (Injury Rehabilitation Questionnaire) during the rehabilitation process.

All data were collected simultaneously, allowing for concurrent analysis of different data and corroboration of data sources. The aim of using a combination of data collection methods was to corroborate the information obtained from each data source and to reduce the problems inherent in a single data collection method (Frechtling & Sharp, 1997).

Data Analysis

All interviews were audiotaped and transcribed verbatim. A hierarchical content analysis, as recommended by Patton (1990) and adapted to sport by Scanlan, Stein, and Ravizza (1989) and Gould, Eklund, and Jackson (1993), was then used to analyze the interview findings and the completed diaries. As suggested by Tesch (1990), a detailed examination of the data were performed. Specifically, the following five-step analysis was used: (a) All of Tom's oral and written descriptions of his injury experience were read to allow the analyzer to obtain a familiarity; (b) from the transcripts, significant statements and phrases that directly pertained to athletic injury were extracted for all six phases; (c) these significant statements were arranged with like terms to form raw data themes for each phase; (d) these raw data themes were then integrated into higher-order themes that described the frequent elements experienced during the rehabilitation process; and (e) all higher-order themes were compared and categorized into one of two general dimensions (Influential Emotions or Coping Strategies).

The quantitative data were corroborated by the qualitative data to assist with the confirmation or rejection of the themes identified. The major benefit of using this mixed methodological approach is that it allows the researcher to obtain a more holistic view of the main factors and reduces the possibility of inaccurate interpretations of the qualitative data.

Results

Content analysis was conducted for each phase of the rehabilitation process and split into the general dimensions of Influential Emotions (In. Em.) or Coping Strategies (C.S.). The initial injury phase was composed of five higher-order themes: Shock, Helplessness, Depression/Frustration, and Anger (In. Em.) and Information Gathering (C.S.). The presurgery phase coalesced seven higher-order themes: Apprehension, Anger, and Depression/Frustration (In. Em.) and Problem-focused Coping, Emotion-focused Coping, Avoidance Coping, and Social Support (C.S.). The postsurgery phase identified four higher-order themes: Relief and Anxiousness

(In. Em.) and Problem-focused Coping and Avoidance Coping (C.S.). The early limited participation phase was composed of five higher-order themes: Encouragement and Apprehension (In. Em.) and Goal Setting, Avoidance Coping, and Influence of Previous Injury Knowledge (C.S.). The late limited participation phase coalesced seven higher-order themes: Encouragement, Apprehension, and Depression/Frustration (In. Em.) and Benefits of Goal Setting, Social Support, Problem-focused Coping, and Avoidance Coping (C.S.). The return-to-play phase was composed of six higher-order themes: Confidence Building, Apprehension, and Relief (In. Em.) and Goal Setting, Problem-focused Coping, and Social Support (C. S.).

Discussion

The results of the present case study are presented according to the six identified phases:

Initial Injury Phase

Like many other athletes, Tom's initial response to his injury was one of shock and disbelief (Evans & Hardy, 1999; Grove & Gordon, 1995; Johnston & Carroll, 1998), especially due to the delay in the diagnosis and the resulting layoff from sport. Tom stated, "I thought it was just another of those bumps and bruises that you get when you play, simple knocks that occur that you shake off with a bit of icing. To find out I was out for the season was a massive blow, I couldn't believe it." On the ERAIQ Tom reported, "I was very shocked at the length of time I would be out for and completely gutted at the amount of rugby I was going to miss."

In accordance with previous findings in the injury rehabilitation literature, following the diagnosis and initial shock, Tom experienced a wide range of mainly negative emotions (McDonald & Hardy, 1990; Tracey, 2003). Anger at the soreness in his knee and the length of time he was expected to be in rehabilitation was evident, as were a sense of helplessness and feelings of uselessness. These emotions were compounded by the loss of independence that he experienced and needing others to do simple tasks for him. Tom stated, "I felt really bad because a lot of those simple things you do every day without thinking about, I needed help with, I just wanted to carry on with a normal lifestyle." This observation was confirmed by relatively high scores on helplessness (12) and frustration (10) on the ERAIQ.

During his interviews and in his diary, Tom reported some frustration and depression as a result of his injury. He stated, "I initially thought about my career, worried it was over. Then I was gutted at missing playing time and knowing how much time I'd miss. I had a goal to be an international player this season; that's gone now. I just want to play." These emotions are commonly experienced by athletes responding to injury (Brewer, 2001), and while they are generally the most intense immediately following injury, they decrease over time and are typically replaced by more positive emotions (Quackenbush & Crossman, 1994).

Grove and Gordon (1995) emphasized the benefit of early acceptance of injury by an athlete, highlighting that the injured athlete will then focus on the recovery and become actively involved in the rehabilitation program. Tom insinuated that he had no time to dwell on the injury and that acceptance had to occur immediately, as little time was available between diagnosis of the injury severity and the surgical

intervention. This acceptance did encourage him to seek further information regarding the surgery and the rehabilitation process, to which he later attributed his successful rehabilitation. Previous research has demonstrated the benefit of acceptance to injury rehabilitation (Bianco, Malo, & Orlick, 1999; Brewer, Linder, & Phelps, 1995). See Figure 1.

Presurgery Phase

Both emotion-focused (self-talk, reassurance) and problem-focused (information gathering on medical procedures and rehabilitation programs) coping strategies were employed by Tom during this stage (see Figure 2). In particular, the use of problem-focused coping provides the athlete with control over his or her rehabilitation and return to competitive sport. This is best achieved by seeking medical advice,

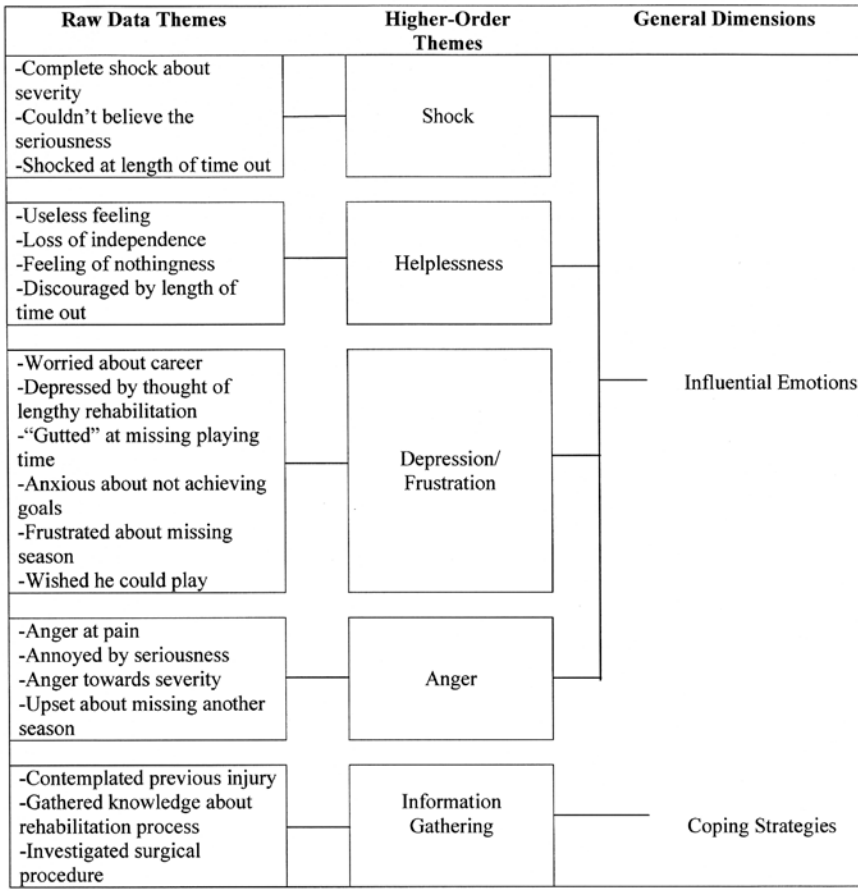

Figure 1 — Initial injury phase.

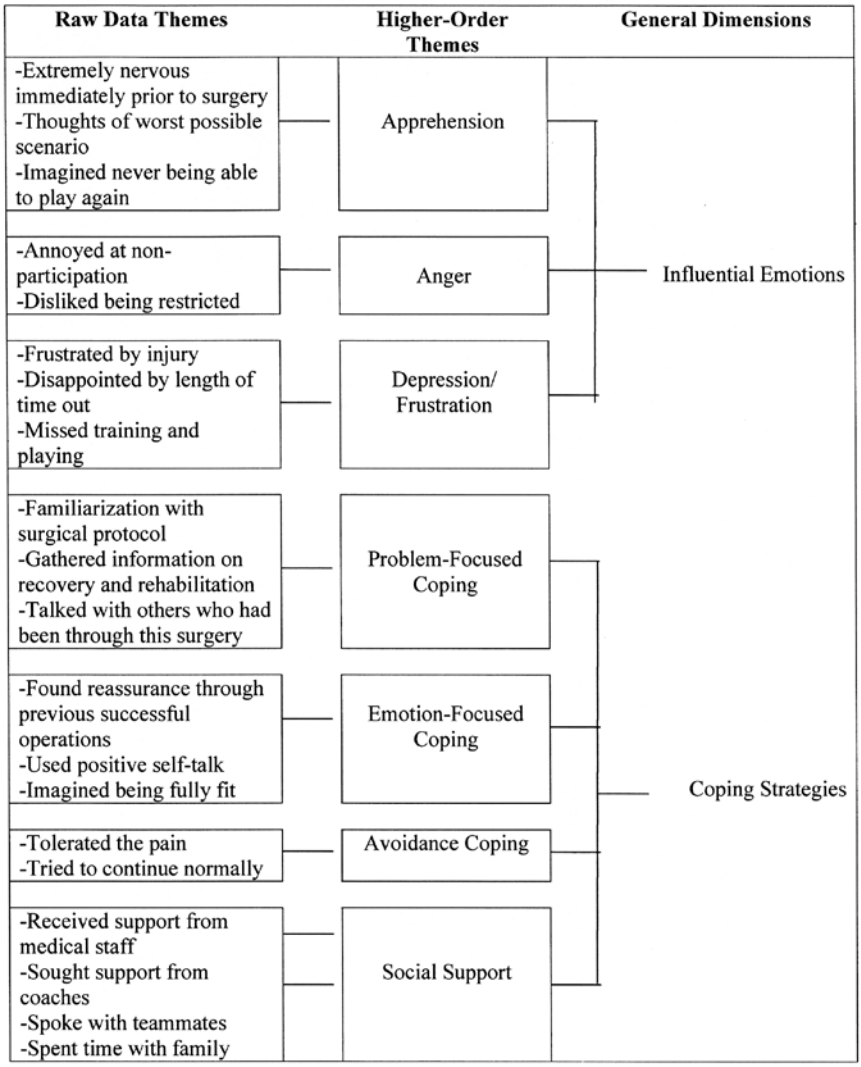

Figure 2 — Presurgery phase.

adhering to the rehabilitation protocol, and setting goals for rehabilitation (Kerr & Miller, 2001). Tom also used avoidance coping to deal with the physical pain.

Tom's prior experience of undergoing surgery also benefited him by reducing some of the negative aspects and apprehension: "I was nervous a couple of minutes before surgery, thinking what happens if it all goes wrong, what if I can't play again? But I knew this was the only way that I would ever play again, so I just tried to relax."

Finally, it has been suggested that social support is a vehicle for enhancing an athlete's well-being (Richman, Hardy, Rosenfeld, & Callan, 1989), and those with high levels of social support appear to fare better when rehabilitating from health related problems (Cohen & Willis, 1985; Udry, 2001; Wiese, Weiss, & Yukelson, 1991). Tom's social support was provided by a network of individuals (Richman et al., 1989). He used his parents to help regain his emotional control and benefited from their willingness to listen and comfort him during difficult periods. Teammates became a source of inspiration to return to full fitness, and the medical staff aided his understanding of the injury and the rehabilitation process. Tom reported, "Having all those people to support me was great. It allowed me to get the support from all areas and not just be limited to one person's advice. I know what some people are like and they would tell me that I would be back playing in 4-6 weeks, which is not what I would have needed. Everyone involved allowed me to keep a realistic view on what I was going to go through." Tom received social support at the presurgery time when it is most needed and often least available (Heil, 1993), and it provided him with feelings of being needed and a sense of security (Wiese et al., 1991). In addition, Tom was also aware of the notion that unskilled others can provide unhelpful support by trying, among other things, to minimize the importance of an event, avoid open communication about the event, criticize attempts at coping, encourage quicker coping, and give inappropriate advice (Lehman, Ellard, & Wortman, 1986).

Postsurgery Phase

Tom's initial response to the successful surgery was of both relief ("I was happy that everything had gone well and comforted to know that I was back on track") and anxiety ("There was some tenderness and soreness in my knee for a good time after the surgery, which really worried me, but my main concern was relating to beginning the rehabilitation"). ERAIQ and SIP data supported the elevation of negative emotion immediately following surgery (LaMott, 1994; Morrey, 1997). See Figure 3.

Both problem-focused and avoidance coping strategies became effective methods for Tom following surgery. In particular, problem-focused coping strategies have been found to increase adherence to exercise (Udry, 1997). Although generally determined to be maladaptive, it could be suggested that Tom also used avoidance coping strategies (learning a foreign language, spending time with family and friends) to prevent uncontrollable negative situations from dominating his life. He stated, "It was nice to be able to get away, have a break, do something different, as I was always concentrating on the injury and trying to get myself fit. By taking up a new hobby I felt that I was developing myself and it had nothing to do with playing or having to compete." In addition to avoidance and problem-focused coping strategies, social support was also present. Green and Weinberg (2001) have suggested that there is a lack of research contrasting the effects of social support and coping skills during injury rehabilitation. They further suggest that an inverse relationship exist between social support and coping skills and mood disturbance following injury.

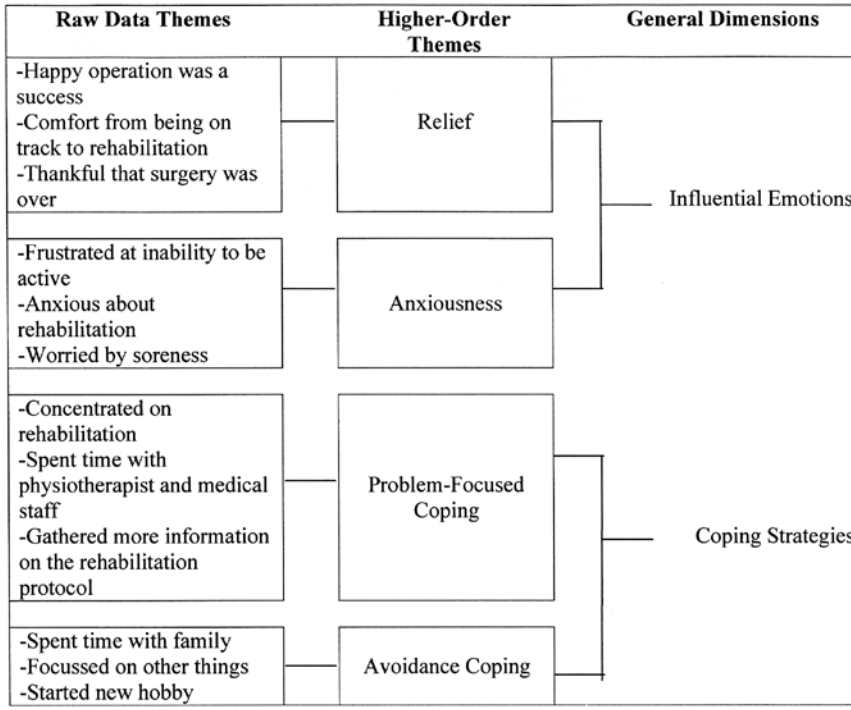

Figure 3 — Postsurgery phase.

Tom had a strong desire to complete rehabilitation and return to competition, which enabled him to reduce the significance of any pain suffered. In this regard, he stated, "At times I felt a bit sore but this was no worse than the pain you get from the regular bumps and knocks you take when playing. I just tried to forget about the pain and concentrate on what I had to do." This was supported by the SIP data. It has been suggested that pain tolerance not only results in greater adherence (Byerly, Worrell, Gahimer, & Domholdt, 1994; Fields, Murphey, Horodyski, & Stopka, 1995) but also appears to be moderated by mental toughness (Levy, Polman, Clough, Marchant, & Earle, 2006). However, the latter requires further research evidence.

Early Limited Participation Phase

Encouragement, particularly by seeing the progress that he was making, was important at this stage of rehabilitation. According to Tom, "I felt good about being able to do some activity again. I could slowly see the improvements; see the range of movement increasing. It was good, made me feel like I was getting somewhere. I was a little closer to returning." Unlike previous research (Bianco, Malo, & Orlick, 1999; Gould et al., 1997; Shelley, 1999), a fear of reinjury was not a major cause of concern at this stage. Rather, there was a fear of failure to

recover (Tracey, 2003), as evidenced by the statement, "At times it is difficult to see me ever playing again or getting back to that level of performance. It is just such a long rehabilitation process."

The early limited participation phase is the first phase where prior injury experience played an influential role (see Figure 4). Tom stated, "I knew I couldn't rush back. I knew the dangers. From before I knew that if I pushed myself too hard then I would injure myself further and be out for even longer." The effects of prior injury experience on rehabilitation have garnered minimal research attention, despite the fact that habit has become a predictor of adherence to health behaviors and exercise participation (Levy, Polman, Clough, & McNaughton, 2006). It could be suggested

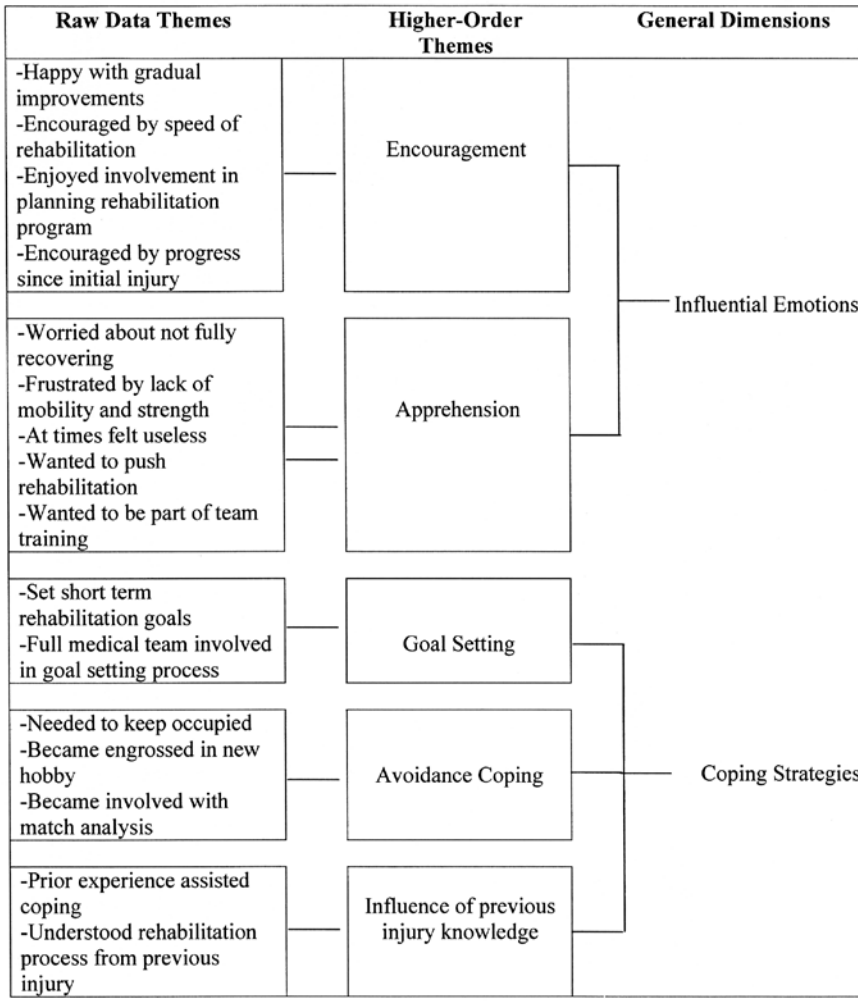

Figure 4 — Early limited participation phase.

that there are both positive and negative aspects associated with similar rehabilitation experiences. Tom's comments suggested that he used his prior experience as a coping strategy and that it was beneficial to him.

The current study lends some indirect support for the utility of goal setting in injury rehabilitation (Evans & Hardy, 2002; Russell, 2000; Theodorakis, Malliou, Papaioannou, Beneca, & Filactakidou, 1996), as goal setting (problem-focused) was a principle coping strategy used by Tom during his rehabilitation. According to Tom, "Having something to focus on is really beneficial. It's not just about the long-term return but setting targets that I know I can reach. I don't have to think of the big picture just some smaller task." An issue, however, is the fixed rehabilitation protocols for ACL injuries. Such fixed protocols allow little input, autonomy, and control on the part of the athlete. Tom found the strictness of the rehabilitation protocol and established goals frustrating, as evidenced by the statements, "I had a target to reach each session and it didn't matter whether I could do more or less than that. When I felt good I wasn't supposed to push myself further, which annoyed me. I knew I could do more, wanted to, but the medical staff said no."

In addition to the aforementioned use of problem- and emotion-focused coping, Tom also used a number of avoidance coping strategies during this stage to remove himself from the injury and avoid constant concentration on his physical state. He stated, "I just needed to keep busy and avoid dwelling on the situation." He became engrossed in his new hobby and assisted with other roles in the club, including match analysis, marketing, and community development. These tasks were particularly important on match days, when Tom, like many injured athletes, found it difficult to watch his teammates perform. Involvement with the match analysis also allowed him to develop his playing skills and develop his "game sense."

Late Limited Participation Phase

Tom experienced both positive and negative emotions during this phase of rehabilitation. The most influential emotions were related to feelings of encouragement (increased motivation, enjoyment, positive experiences), which increased motivation and commitment to the program. "Being able to see the progressions I'd made and that I was getting back closer to playing" and similar comments made by Tom in both the interviews and diary entries highlight this drive. The general encouragement he experienced during this phase allowed him to manage the negative emotions (apprehension, depression/frustration) that were occasionally experienced. Tom's worries were related to minor setbacks within the rehabilitation process and doubts about his capacity to return to full fitness levels (Bianco, Malo, & Orlick, 1999). A number of coping strategies were used to overcome such negative thoughts. This phase of rehabilitation highlights Folkman and Lazarus' (1985) notion of the dynamic nature of coping, involving varied and multiple strategies. Goal setting, social support, problem-focused coping and avoidance coping were all used during this phase.

As Tom experienced increases in self-confidence and competence by achieving set goals, he was allowed to have more control over his rehabilitation protocol and was allowed to decide on specific activities within his training. The sports injury rehabilitation literature is replete with research highlighting the benefits of variety on adherence and motivation (Niven, 2007; Taylor & Taylor, 1997), and in fact, allowing Tom additional control over his program appeared be beneficial. Tom

stated, "I was able to do different things, try different exercises that should produce the same effect. It wasn't just running in a straight line." Similarly, the increased autonomy emphasized by his medical team also appeared to improve adherence. The importance of autonomous regulation in relation to adherence has long been discussed within the health psychology literature, and Tom's experience adds support to this body of work (Ryan, Plant, & O'Malley, 1995; Williams, Rodin, Ryan, Grolnick, & Deci, 1998). It can be suggested that perceived autonomy leads to greater motivation and adherence to an injury rehabilitation program and, therefore, may possibly lead to a quicker return to play.

Research has also acknowledged that significant others (i.e., health care providers, family, educators) providing an autonomy-supportive environment could greatly influence an individual's level of motivation and program adherence (Malek, 2006; Williams et al., 1998). Both of the Perceived Autonomy-Supportive Climates questionnaires emphasize the sizeable amount of autonomy Tom was granted during his rehabilitation. Although structured within the constraints of the rehabilitation protocol, Tom strongly agreed that both his physiotherapist and coach, while not quite to the same extent, provided an autonomy-supportive climate. This is consistent with recent research highlighting the importance of physiotherapists in providing an autonomy-supportive climate within sports injury rehabilitation (Levy, Polman, & Borkoles, in press; Niven, 2007).

Finally, during this phase, Tom also identified a change in the importance of social support, moving away from the family and becoming more focused on the staff in charge of his rehabilitation. According to Tom, "The support from my family and friends was still useful, but it was the support from the physiotherapist and trainers that was crucial. They were the ones who would really help me get back on the field." (See Figure 5.)

Return to Play Phase

Of primary concern to Tom during this final phase was confidence building and developing the belief that he was physically ready to return to competition. He stated, "I took great confidence from the preseason training and the strength in my knee. I had concerns relating to my overall fitness but the medical staff reassured me that the preparation and testing my knee had gone through meant it was healthy." This statement lends some support to the notion that confidence training, focusing on the internal and controllable aspects of confidence, is beneficial to returning athletes (Wagman & Khelifa, 1996). Evans, Hardy, and Fleming (2000) found self-efficacy to be very important during the final phase of injury rehabilitation and suggested that interventions at this phase should focus on regaining confidence. Podlog and Eklund (2006) identified similar concerns relating to doubts about performance (and fear of reinjury). However, Tom appeared to experience minimal fear of reinjury. The role of social support was of key importance to eradicating injury fears and increasing Tom's confidence. Magyer and Duda (2000) suggested that athletes receiving high levels of social support experience a greater quantity of self-confidence throughout rehabilitation. Medical staff members were involved in a variety of ways, such as reassuring Tom that his knee was fully rehabilitated, providing information in response to his concerns, and in conjunction with the coaching staff, setting goals for him to achieve. The coaching staff also avoided any discussions connected to the injury and maintained a highly positive atmosphere.

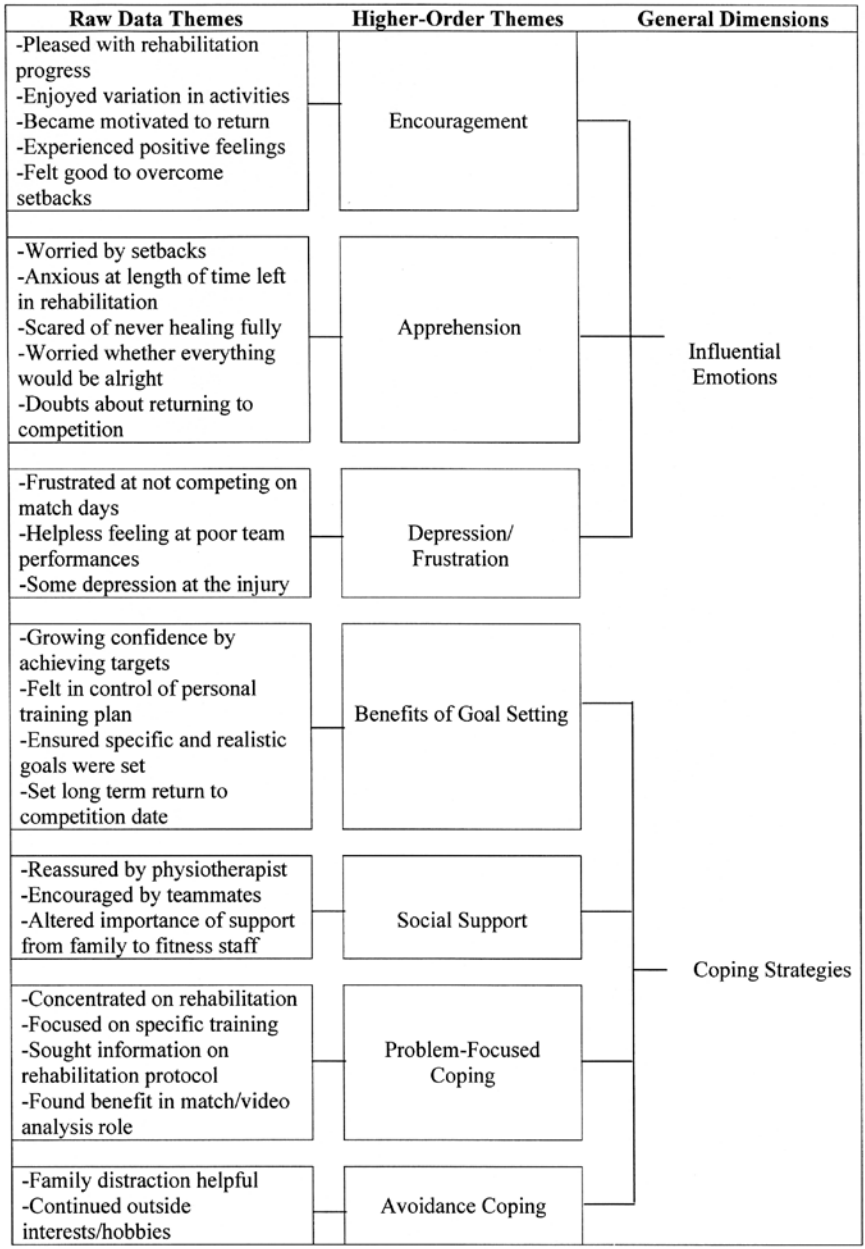

Figure 5 — Late limited participation phase.

Tom's teammates provided useful support and encouragement as well, allowing him to feel integrated and part of the team again. Tom's first competitive game following his rehabilitation was a home game, and the encouragement of the supporters was helpful. According to Tom, "It was awesome having the first game at home. The crowd noise was brilliant and I got such a cheer when my name was called, it really pumped me up, really focused me." His average score of 4.6 for the emotional/information support section of the MOS-SSS indicated the high level of support he received to aid his return to competition.

The development of a preperformance routine was beneficial as well (Jackson & Baker, 2001), as exemplified by the statements, "Following the same routine really helped. It made me concentrate on my performance and my role within the team, preventing me from concentrating on my knee." Activities that promote familiarization and encourage positive emotions related to prior performance have been hypothesized to benefit the returning athlete. However, additional research on this is needed.

Also during this phase, intense training allowed Tom to realize that his knee was physically strong enough for competition. This training promoted perceptions of competence (Podlog, 2006) and increased familiarity with required performance standards (Bianco, 2001; Podlog & Eklund, 2006). A general sense of relief was identified following return to competition, and an increased sense of competence was gained with each performance. Tom asserted, "Knowing that I could compete at the top level again was a real thrill. I felt better, stronger, and knew that I was back where I wanted to be. My knee stood up really well and I knew that everything was going to be good." (See Figure 6.)

Limitations and Future Directions

Much research has identified the uses and potential advantages of goal setting within a rehabilitation context (Evans & Hardy, 2002; Theodorakis, Beneca, Malliou, & Goudas, 1997), and it has been suggested that goal setting can increase the autonomy of an athlete during the rehabilitation process (Levack, Dean, Siegert, & McPherson, 2006). Some caution may need to be taken, however, when integrating goal setting into an injury rehabilitation program, because the specificity of an ACL rehabilitation protocol dictates the quantity of work the rehabilitating athlete can perform, and therefore a number of set goals are already established without any input from the athlete. This could influence the amount of autonomy experienced by the rehabilitating athlete and could subsequently affect psychological rehabilitation and adherence. Thus, further research needs to be undertaken to investigate these issues.

The idiosyncratic nature of case study research warrants discussion. Gallagher and Gardner (2007) have suggested that individual dispositional differences in the form of early maladaptive schemas have an influential impact on each athlete's response to injury. It is therefore possible that the emotions experienced and the coping strategies used by Tom were unique to his rehabilitation and occurred as a result of his individual personality structure. Additional research with a larger sample size is therefore needed to identify the generalizeability of these responses. Likewise, the effectiveness of the coping strategies employed has not been assessed within this study and further investigation is required. Finally, quantitative research

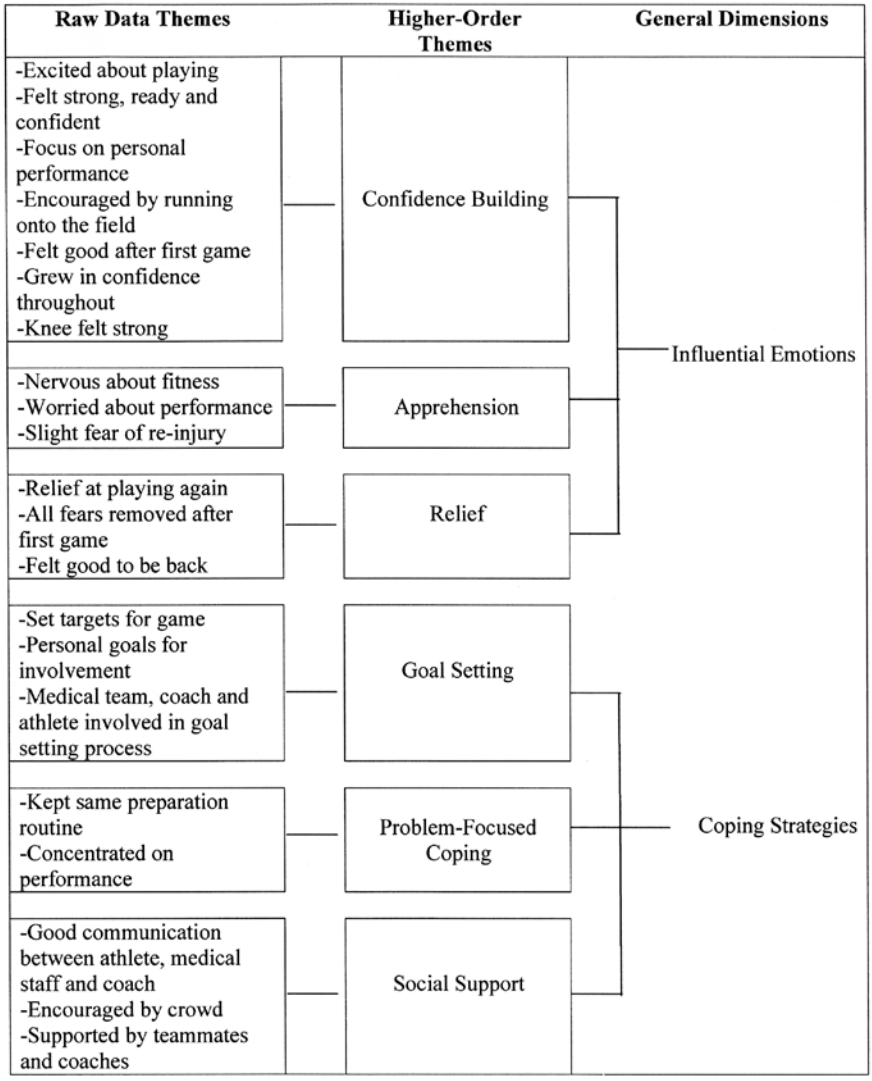

Figure 6 — Return to play phase.

is needed to fully understand the psychological factors associated with positive outcomes. With this in mind, and based on the findings from this case study, two specific questions are suggested for further analysis: (a) Do both approach-based and avoidance coping strategies facilitate rehabilitation, and if so, how do they work? (b) What is the role of autonomy within injury rehabilitation?

Conclusion

While research on the psychology of injury rehabilitation has moved away from stage models (Kubler-Ross, 1969; Pedersen, 1986) to cognitive appraisal models (Brewer, 1994; Wiese-Bjornstal et al., 1998), by identifying the most influential emotions throughout each phase of the rehabilitation process, a linear stage model can be established (shock-depression-relief-encouragement-confidence building). Although further research is required, this model could be useful for those working with professional athletes rehabilitating from severe injury. While currently an open empirical question requiring further investigation, it can be theorized that the occurrence of a setback within rehabilitation will return the athlete to an earlier stage. The influence of coping strategies does appear to assist with the transition between each stage of the proposed model and as such, provides some support for the combination of cognitive appraisal and stage models (Striegel, Hedgpeth, & Sowa, 1996).

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