# READINESS TO RETURN:

# PSYCHOSOCIAL FACTORS AND INJURY RECOVERY

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# DECLARATION

"I, Paulette Mifsud, declare that the Masters by Research thesis entitled Readiness to Return: Psychosocial Factors and Injury Recovery, is no more than 60,000 words in length, exclusive of tables, figures, appendices, references, and foot notes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other degree or diploma. Except where otherwise indicated, this thesis is my own work".

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Date: April 2005

## ABSTRACT

This thesis examined the associations between psychosocial factors, rate of recovery, and readiness to return to competition. The specific psychosocial variables measured were: social support, coping, daily hassles, and rehabilitation self-efficacy. Athletes and dancers ($N = 35$), ranging from club to elite level, who attended a sports medicine clinic for treatment of grade 2 ankle sprains completed the questionnaires. For the purpose of examining associations between psychosocial variables and rate of recovery, athletes were categorised in to slow, on-time, and fast recovery groups by their physiotherapists. The questionnaire was administered on three occasions: after first physiotherapist appointment, middle of rehabilitation, and when physiotherapists gave athletes permission to return to competition or performance. To ascertain whether differences between groups, and changes over time were significant, a series of mixed-design ANOVAs were conducted. Effect sizes, in addition to $p$ values, were reported and discussed. Number of daily hassles and use of coping skills reduced over the entire course of rehabilitation, and social support remained stable. Rehabilitation self-efficacy and readiness to return to competition increased over the rehabilitation period. A number of group main effects (medium to large effect sizes) were found for all emotion-focussed coping, self-efficacy, and readiness variables. No group differences for daily hassles or social support were found. In general, the fast recovery group reported higher self-efficacy and readiness and lower emotion-focused coping than the other two groups. Satisfaction with social support, psychological self-efficacy with rehabilitation, and physical readiness to return to competition were consistently and positively associated with psychological readiness throughout rehabilitation. No variable consistently correlated with physical readiness throughout the three time phases of the study. The results suggest that some variance in rates of recovery and readiness may be accounted for by multiple psychosocial variables. The study also

demonstrated that psychosocial, recovery, and readiness variables change over time. These findings suggest that research into athletic injury rehabilitation needs to take a multivariate approach and incorporate dynamic and temporal elements. Results of this thesis partially supported aspects of the biopsychosocial model of athletic injury rehabilitation. Sports medicine teams may need to take into consideration both physical and psychosocial factors when devising rehabilitation programs for recovering athletes.

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# CHAPTER 1

## INTRODUCTION

Sport participation has numerous benefits, but injuries are common and often incur emotional, physical, and financial costs. The cost of sports, recreation, and physical activity injuries in Australia in 1990 amounted to 1 billion dollars a year (Egger, 1990), and by 2002 that figure had increased to an estimated 1.65 billion a year (Orchard & Finch, 2002). A report by Medibank Private Insurance (2003) confirmed this estimate, adding that 1 in 17 Australians become injured as a result of sport participation every year. They noted that the physical activities which had the highest risk of injury, were not limited to contact sports such as football and netball, but also included dancing.

Sports medicine researchers interested in identifying ways to reduce rehabilitation times for competitive athletes initially examined only physical determinants of recovery and return to competition (Aoki, Ogiwara, Ohta, & Nabeta, 1998). Surgical procedures (e.g., Zoch, Fialka-Moser, & Quittan, 2003), post-surgical treatment (e.g., Kruger, 1993), and use of anti-inflamatory drugs (e.g., Houglum, 1998) have all been examined in an attempt to identify, and then standardise, best practice treatment. Findings from such studies have shown that outcome variables such as length of rehabilitation, time taken to reach a specific percentage of pre-morbid flexibility, or regaining strength in ankle injury, vary considerably among patients undergoing similar treatments for the same grade injuries (Wilkerson, 1991; Zavadak, Gibson, Whitley, Britz, & Kwoh, 1995). The question arises about the sources of such variability.

Athletic injury has both physical and psychological repercussions (Crossman, 1997). For example, many athletes define themselves by their sport

activities and experience identity problems if forced to stop playing (Striegel, Hedgpeth, & Sowa, 1996; Webb, Nasco, Riley, & Deadrick, 1998). Athletes with even relatively minor injuries experience a shift in their roles, relationships, routines, and assumptions (N. K. Schlossberg, personal communication, July 28, 2004). These changes may be perceived as major disruptions to their lives (Johnson, 1996; Stambulova, 2000) and could result in lowered feelings of self-worth and depressed moods (de Heredia, Munoz, & Artaza, 2004). This inclusive view of recovery is supported through health and occupational research exploring psychological factors that influence rate of recovery, outcome of recovery, and readiness to return to premorbid functioning (e.g., Jenkins, Stanton, & Jono, 1994; Smith, McMurray, & Disler, 2002; Zemper et al., 2003). Further support is evidenced by the numerous occupational and health rehabilitation units such as Cedar Court in Australia and the Mayo Clinic in the United States of America that provide both physical and psychological services for injury recovery. Given that rehabilitation from injury has a psychological component, to what extent do the psychological responses influence rate of recovery? Could the psychological factors account for some of the variability in healing rates of athletes with similar injuries?

The literature on psychological aspects of athletic rehabilitation suggests reasons as to why psychological components could contribute to variability in recovery. Athletes have demonstrated a range of emotional responses to injuries and injury rehabilitation that may impair or facilitate recoveries (Morrey, Stuart, Smith, & Wiese-Bjornstal, 1999). For example, emotional responses include anger, depressed mood, fatigue, confusion, tension, relief, hope, and optimism (de Heredia et al., 2004; Johnston & Carroll, 1998a; Quackenbush & Crossman

1994). Many of the concurrent physiological changes that occur during psychological stress may impair recovery (Brosschot et al., 1994). Prolonged distress may impair the immune system and slow the musculo-skeletal system's ability to repair itself (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002; Kiecolt-Glaser, Page, Marucha, MacCallum, & Glaser, 1998). People who do not get as distressed when injured, or who have coping skills that help reduce or buffer stress, may recover at a faster rate than those who experience prolonged emotional distress.

In addition to the physiological consequence of affective states, emotional responses may lead to behaviours and cognitive approaches that could influence rate of recovery. A positive motivated approach may increase the likelihood of treatment adherence (Daly, Brewer, Van Raalte, Petitpas, & Sklar, 1995). High levels of confidence may influence athletes' abilities to manage the demands of rehabilitation (Quinn & Fallon, 2000), which in turn could influence their recovery rates (Ievleva & Orlick, 1991) and readiness to return to competition (Evans, Hardy, & Fleming, 2000; Magyar & Duda, 2000).

Another factor that may influence recovery rates is that the course of rehabilitation is not always constant (Taylor & Taylor, 1997). Psychological factors such as social support or daily hassles may influence adherence to treatment or efficacy beliefs regarding treatment (Laubach, Brewer, Van Raalte, & Petitpas, 1996). Changes in these psychological factors may in turn cause changes in rate of recovery.

The above reasoning is supported by Heil (1993) and Wiese-Bjornstal (2004) who suggested that cognitive-behavioural responses to injury vary and may contribute to maladaptive adjustment or normal adjustment to injury.

Wiese-Bjornstal stated that a distinguishing feature between maladjustment and normal adjustment is the duration, intensity, and resolution of negative psychological responses. Given this information, it is plausible that the current variability in recovery rates is associated, to some degree, with psychological factors influencing recovery.

Exploring readiness to return to competition is important because "some athletes are physically healed and ready to return to sport yet are not mentally prepared to return to competition" (Morrey et al., 1999, p. 63). Researchers have suggested that readiness influences the speed of progressing through transitions such as injury (Schlossberg, 1984). Readiness may influence recovery time, as well as be influenced by rate of recovery (Brewer, Andersen, & Van Raalte, 2002). The interplay between readiness and rate of recovery among rehabilitating athletes has not been adequately investigated, and more studies that measure the influence of psycho-social variables on readiness to return to competition are needed. Because returning to competition is a goal of most injured athletes, their readiness to return and the influence of readiness on rate of recovery warrants further investigation. The aim of this study was to explore the relationships between psychosocial factors thought to relate to rate of recovery and readiness to return to competition. In so doing, this study provides some evidence that can be used by future researchers to examine the causal influences of various psychosocial variables on rate of recovery and readiness.

## The Present Study

This study explored psychological variables in relation to the injured athletes' rates of recovery and readiness to return to competition after injury. Injuries in this study were grade 2 ankle sprains. A sprained ankle means that one

or more ligaments on the outside of the ankle are stretched or torn. Grade 2 refers to the degree of tear and requires on average 6-8 weeks for full recovery. This injury type was chosen because of its frequency. People with different injuries heal at different rates, and using one injury type helped reduce that variability.

Recovery was defined in physical (functional movement) and psychological (readiness) terms. Physiotherapists determined the time when the athletes were healed enough to return to competition. On the basis of this physical assessment, physiotherapists divided athletes into slow, on-time, and fast recovery groups. Injured athletes also made personal judgements regarding their physical and psychological readiness to return to competition.

Variables explored in this study were social support, coping styles, daily hassles, and confidence. These variables were chosen for two reasons. First, a review of studies in the sport and occupational health literature revealed that these variables act independently, or in conjunction, to influence rate of recovery and readiness to return to former function (Bohachick, Taylor, Sereika, Reeder, & Anton; 2002; Jenkins et al., 1994; Von Weiss et al., 2002). Second, each variable fitted into the biopsychosocial model of athletic rehabilitation (Brewer et al., 2002).

In order to clarify which variables, if any, were related to readiness to return to competition, the strength of relationships between the psychosocial variables, rate of recovery, and readiness was explored. An examination of the profiles of the slow, on-time, and fast recovery groups clarified the relationship between psycho-social variables and rate of recovery. The literature suggested that the role of psychological variables associated with recovery changes over time. The potential change in variables over time was necessary to explore

because temporal changes in one or all of these variables may have influenced the persons' perceptions, psychosocial environments, or individual characteristics, and consequently, may have influenced the athletes' rate of recovery or readiness to make the transition from injury to full participation.

The following research questions were asked: (a) Is there an association between readiness to return and social support numbers and satisfaction, coping strategies, daily hassles, and rehabilitation confidence? (b) Will there be a change in social support, coping styles, daily hassles, confidence, and readiness over the rehabilitation period? (c) Will slow, on-time, and fast recovery groups display different profiles in terms of social support numbers and satisfaction, coping strategies, daily hassles, confidence in rehabilitation, and readiness to return to competition?

Psychosocial variables found to be associated with rate of recovery and readiness to return to competition could be used to develop psychologically based rehabilitation programs that may reduce recovery time. Weiss (2003) stated "given the volume and severity of injuries that occur in any given year, the quest for continued knowledge about maximizing injured athletes' mental recovery, and hastening their return to a physically active lifestyle is a work in progress" (p. 172). This thesis extends the existing literature and contributes to that "work in progress."

# CHAPTER 2

# REVIEW OF LITERATURE

Research into rehabilitation has shown that factors influencing recovery are far more complex than mere physical variables, and recovery is more than a physical function (Brewer et al., 2002; Jenkins et al., 1994). Recovery also incorporates well-being, mental readiness, and satisfaction with progress (Blumenthal & Mank, 1994). Athlete responses to rehabilitation and return hint at the influence psychosocial, as well as physical, variables may have on recovery. Some athlete characteristics appear to be associated with faster recoveries, whereas others seem to result in slow recoveries (de Heredia et al., 2004; Morrey et al., 1999). Research into psychosocial factors influencing recovery across the health domain is far more extensive than within the sport domain. Any adequate attempt to review the relationship between psychosocial variables and recovery needs to cross disciplines. Chapter 2 covers studies that have examined psychosocial factors, recovery, and readiness to return to pre-injury functioning across the health, work, and sport domains. The reviewed literature suggested that the following psychosocial variables have an influence on readiness and recovery: social support, coping, daily hassles, and confidence (Ievleva & Orlick, 1991; Jenkins, Jono, Stanton, & Stroup-Benham, 1990; Johnston & Carroll 2000; Marks, 2001; Quinn and Fallon, 2000; Wiese-Bjornstal, 2004). These variables were therefore given specific attention. Concepts of confidence and self-efficacy (expectations regarding the successful completion of a particular task) share considerable overlap (Magayar & Duda, 2000). In this thesis, participants' levels of rehabilitation self-efficacy were assessed. In order to maintain consistency of

concept throughout the paper, self-efficacy is addressed as confidence. The exceptions are where the term has been stipulated as self-efficacy by other authors, or where the use of the term self-efficacy brings a more appropriate understanding of the sentence. Models of athletic injury, and information on the way athletes respond to injury and return to sport, are provided as contextual background. A review of papers that address various individual psychosocial variables examined in this study follows. Prior to the review of each psychosocial variable, the dominant conceptual frameworks and measures used by researchers examining the variable will be discussed. Multiple variable studies that have combined the psychosocial factors under review will be examined separately. These studies are similar to the variable choices and design used in this research. They also provide a comprehensive view of the way psychosocial variables may influence recovery.

## Models of Athletic Rehabilitation and Recovery

Brewer et al. (2002) proposed a biopsychosocial model of athletic injury rehabilitation. They illustrated how physical, psychological, and socio-demographic factors may influence intermediate biopsychosocial outcomes such as range of motion, strength, rate of recovery, pain, and ultimately sport injury rehabilitation outcomes such as functional performance, quality of life, treatment satisfaction, and readiness to return to sport. The model is four tiered. The first tier illustrates characteristics of the injury and socio-demographic factors that influence the second tier of biological, psychological, and socio-contextual factors. Central to the second tier factors are the psychological variables. These factors can influence, and be influenced by, the other factors on this level. In turn, the combined influence of the second tier affects the third

tier of intermediate biopsychosocial outcomes and the fourth tier of sport rehabilitation outcomes. (See Figure 2.1, p. 11)

Wiese-Bjornstal, Smith, Shaffer, and Morrey (1998) presented a psychosocial model of response to injury and rehabilitation that is based on stress process models and coping theory. The model suggests that a medical event such as illness or injury leads to a dynamic and ongoing process of cognitive appraisal that results in various affective states that activate specific behavioural responses. Wiese-Bjornstal et al. suggested that people enter into a medical event, such as an injury, with specific pre-dispositions. These incorporate personality and past history, both social and medical. The individuals' unique characteristics such as coping patterns, levels of anxiety, and attribution styles may assist or detract from their ability to adapt to stressors and resultant changes in their roles and environments. The interactions of these unique characteristics within individuals are what determines the various different emotional responses and behaviours that occur in response to injury and rehabilitation. Wiese-Bjornstal (2004) further illustrated the athletes' response process and described individual's reactions, responses, and adjustments to injury and illness. The injured person initially has a psychological reaction that is immediate, somewhat uncontrolled, and comparatively short in duration. Next, the individuals evaluate their situations and make response choices that are either detrimental to or beneficial for the recovery process. In either way, these secondary evaluations are dynamic and continue to interact with the environment. Wiese-Bjornstal considered the following to be important factors that influence responses to injury: identity, coping, optimism, locus of control, self-perceptions, attributions, religious beliefs, and mood states. The

interplay between the environment and response patterns results in the individual's unique adjustment to the injury and rehabilitation environment. Adjustment may be normal, or individuals may show signs of sub-clinical adjustment problems or full-blown adjustment disorders. The latter usually resulting in ongoing irrational thoughts, unresolved grief, and chronic non-compliance to rehabilitation regimes. An adaptation of the Wiese-Bjornstal et al. model of injury rehabilitation and Wiese-Bjornstal (2004) model of reaction, response, and adjustment to injury is found on p. 12.

The Brewer et al. (2002), Weise-Bjornstal et al. (1998), and Weise-Bjornstal. (2004) models make use of the cognitive-behavioural approach to understanding factors that influence recovery. Other models that have used the cognitive behavioural approach to explain athletes' responses to injury are: Rotella's (1985) adaptation of the Moos and Tsu (1977) crises model of coping with physical illness, Wiese-Bjornstal and Smith's (1993) adaptation of Andersen and Williams' (1988) model of athletic injury occurrence, and Weiss and Troxel's (1986) psychophysiological stress model. All these models also incorporate concepts from Lazarus and Folkman's (1984) transactional model of stress and coping.

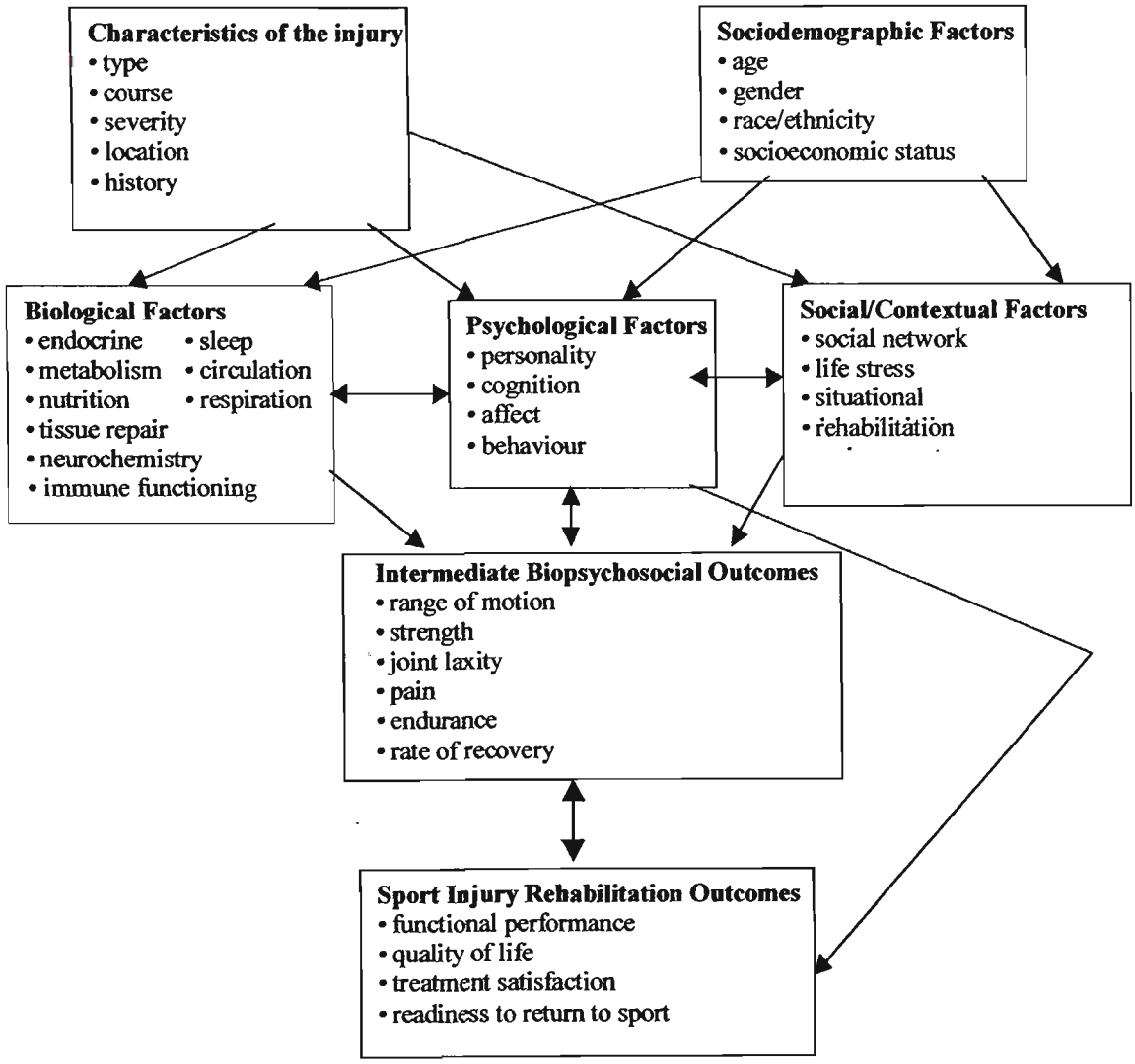


Figure 2. 1. From Brewer, B. W., Andersen, M. B., & Van Raalte, J. L. (2002). Psychological aspects of injury rehabilitation: Toward a biopsychosocial approach. In D. I. Mostofsky, & L. Zaichkowsky (Eds.), *Medical aspects of sport and exercise* (pp. 41-54). Morgantown, WV: Fitness Information Technology. Permission to use granted from authors.

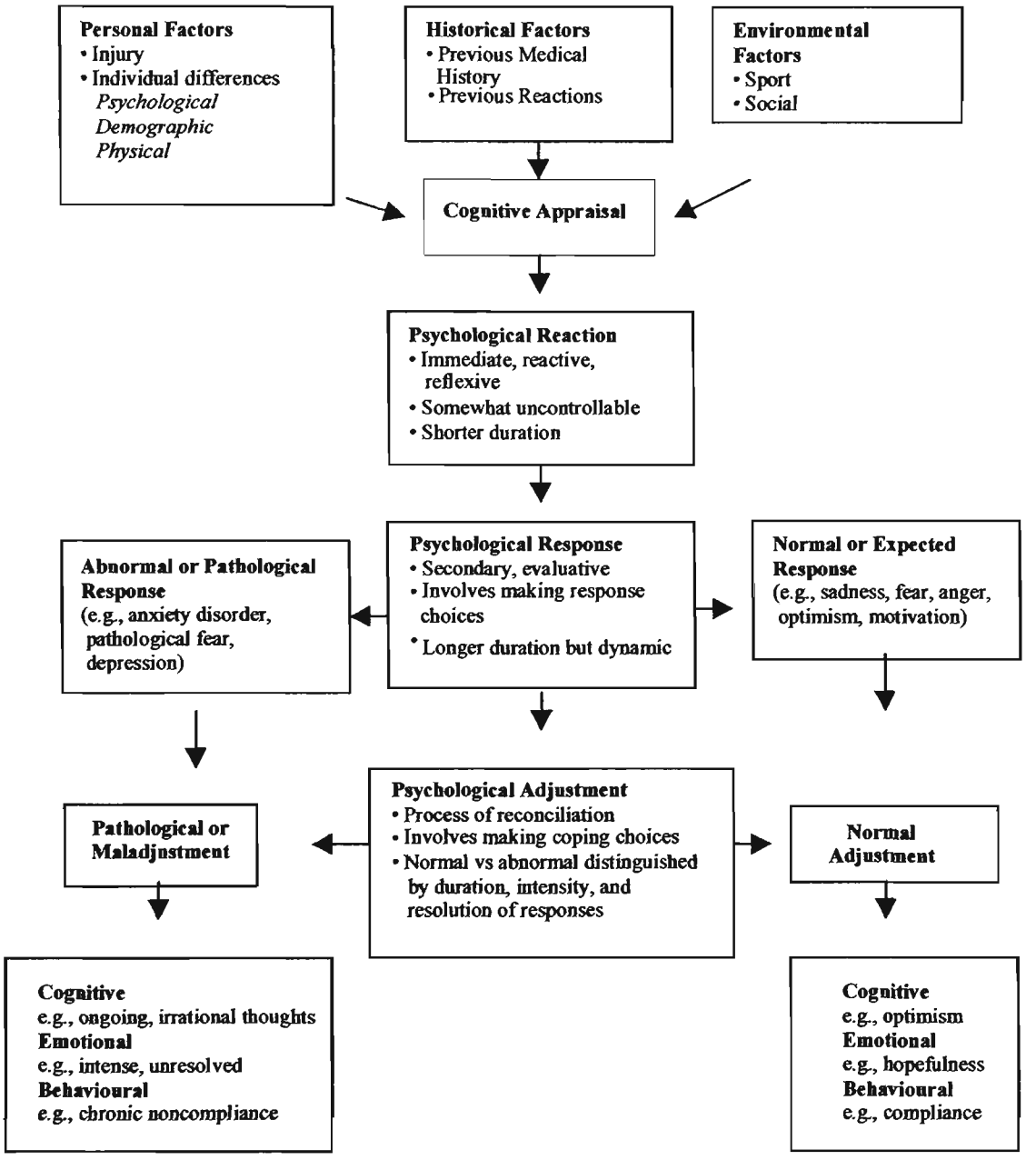


Figure 2.2. Combined Models of Athletic Injury Rehabilitation and Reaction, Responses, and Adjustment to Injury and Illness — Adaptation from Wiese-Bjornstal (2004).

## Athlete Response to Injury, Rehabilitation, and Return to Sport

Recently, studies have demonstrated that athletes use a variety of cognitive, emotional, and behavioural responses to manage injury (e.g., Albinson & Petrie, 2003; Daly et al., 1995). Below are some examples of how appraisals can influence emotions and behaviour such as rate of recovery and return to sport participation. Athletes may positively appraise their rehabilitation as time out, allowing time to rectify some bio-mechanical, physical, or psychological weakness, thereby returning to competition as stronger competitors. They may also view their return as being able to resume activities that provided them with enjoyment, pride, and esteem (Heil, 1993). This positive appraisal may result in motivated affective states, whereby the athletes will put much effort into adhering to their rehabilitation programs (Brewer et al., 2003). High levels of confidence (Quinn & Fallon, 2000), use of realistic goal setting (Magyar & Duda, 2000), and effective coping styles (Gould, Udry, Bridges, & Beck, 1997) could be other emotional, behavioural, and cognitive factors that lead to a quicker or better quality recovery. Occasionally, in their eagerness to get better, some athletes exercise beyond what medical staff suggest, or return to competition too early, and possibly re-injure themselves (Shelbourne & Foulk, 1995; Williams & Roepke, 1993).

Other athletes believe that as a result of their injuries they no longer have the requirements to meet the demands of the competitive environment, and may doubt their fitness, skill levels, speed, and strength (Smith, Scott, & Wiese, 1990). These athletes may not be motivated to put in the effort to recover quickly because they fear the consequences of not being able to retain their former positions or rankings (Heil, 1993). Due to the feelings of worry or threat, fear of re-injury (Chan & Grossman,

1988), or injury to another part of the body, athletes' return to competition may be compromised or delayed. Crossman and Jamieson (1985) demonstrated the deleterious effects of negative appraisal on mood. They found that athletes who appraise their injuries as more serious experienced greater levels of depression, anxiety, and apathy. de Heredia et al. (2004) took this information one step further and showed that higher levels of negative mood, tension, and fatigue were associated with slower recovery. Morrey et al. (1999) also found that higher levels of mood disturbance were associated with poorer short-term recovery.

A strength of the cognitive-behavioural framework is that it takes into account the athletes' unique differences (Brewer, 1994). The following example shows how a similar situation can lead to different outcomes. The difference in response suggests that other personality, or situational factors, may moderate the athletes' responses. Athletes may feel that by being injured and not competing they are letting the team, the coach, and the fans down. This feeling of guilt may spur them on to return to full participation quicker than prudent (Weiss & Troxel, 1986). Alternatively, the feeling of guilt combined with a sense of helplessness may do the opposite. The combination of these emotions may lead to a sense of blame and self-punishment that could ultimately retard, rather than facilitate, the recovery process (Wiese-Bjornstal, 2004). Self-blame and self-punishment result in a further decrease in confidence. This process may translate into injured athletes not believing that they are capable of meeting the rehabilitation demands (Heil, 1993; Quinn, 1996), and not feeling satisfied with their progress (Theodorakis, Beneca, Malliou, & Goudas, 1997). Consequently, they may

put in less effort to adhere to rehabilitation (Duda, Smart, & Tappe, 1989; Fisher, Domm, & Wuest, 1988).

Various situational factors influence the appraisals of injured athletes. These factors include time of the injury in relation to competition, variables within the rehabilitation environment, and flexibility in scheduling rehabilitation (Gordon, Milios, & Grove, 1991; Rotella & Heyman, 1986; Sanderson, 1978; Weiss & Troxel, 1986; Yaffe, 1983). Length of recovery may also influence appraisals, moods, and ultimately behaviours. Smith, Scott, O'Fallon, and Young (1990) studied 72 injured athletes and found that longer rehabilitation times led to greater likelihood of negative mood disturbances occurring. They suggested that athletes who are injured, and out of their regular routines, have more time to think and may develop more negative appraisals. The drawn out rehabilitation times could also lead athletes to re-appraise the value of their sports. While injured, the athletes may have time to explore other activities that may become more attractive and more valued than their sports. Consequently, athletes may become more motivated to participate in these new activities and may show a temporary or permanent decrease in motivation to return to full participation in their own sports.

This contextual information on athletes' responses to recovery and return suggests that any number of medical, socio-demographical, psychological, and situational factors may have contributed to the variability in recovery focused in the literature. Identifying what factors are most likely to influence recovery, and understanding the cognitive-behavioural pathways that these factors take in moderating recovery can be important for physiotherapists and other sports medical staff. Through

this knowledge sports medicine staff may be able to modify the environment or help athletes develop more beneficial responses. In reviewing the vast literature on injury recovery the following psychosocial variables appear to have the most influence: social support, coping styles, daily hassles, self efficacy, and readiness (Ievleva & Orlick, 1991; Jenkins et al, 1990; Johnston & Carroll 2000; Marks, 2001; Quinn and Fallon, 2000; Wiese-Bjornstal, 2004). They will be reviewed in the next section.

## Psychosocial Factors Influencing Physical Recovery

### *Social Support*

A number of models have been developed to explain the relationship between social support, injury, illness, and recovery. The direct-effect model is partially grounded in the attachment theory (Bowlby, 1969). Bowlby suggested that the primary pre-requisites for well being is support, and that without the crucial support of the initial family structure, or any other significant social structure, the individual may not develop a strong sense of self. Even without stressful life events occurring, the individual may be distressed. The direct-effect model suggests that the positive effect of strong social ties allows individuals to develop a strong sense of well being. This sense of well being encourages individuals to make decisions that prevent the distress associated with stress. Another direct effect of strong social ties is that individuals may be exposed to a social group whose health views remind the individuals to behave in more responsible ways towards their health (Connell & D'Augelli, 1990; Henderson, 1984).

The stress buffer model of social support states that social support buffers the deleterious effects of major and minor events by influencing individuals' interpretations of stressors, their coping strategies, and their self-concepts (Cohen & McKay, 1984; Lazarus & DeLongis, 1983; Lazarus & Folkman, 1984). The stress-buffering model suggests that the relationship between stress and distress is greater under conditions of low support than it is for high support. That is, under high stress, individuals with low support show more distress than do individuals with high support. Cohen and McKay (1984) and Cohen and Wills (1985) provided an extensive review of the stress-buffering hypothesis.

Bandura (1986) suggested that people with high social support may perceive the world as more supportive, and consequently less stressful, than those with lower social support. It is possible that the low anxiety experienced by people with high support is due to a feeling that the stressors are shared with others (Sarason, Levine, Basham, & Sarason, 1983). Social support may also function as a distraction and in so doing help manage stress. The process of talking to others enables people to shift their attention off the painful or stressful experiences onto more enjoyable or functional thoughts and behaviours. This coping process is more likely to be used when there is greater social support. Greater social support may also strengthen individuals' self-concepts by helping them feel more valued, and helping them develop more confidence to address the stressors. Although the stress buffering hypothesis is one of the most accepted and prevalent explanations of the function of social support on stress reduction, studies demonstrating the stress buffering hypothesis have produced mixed results (Kirk-Sanchez, 2004; Schultz et al., 2004; Cohen & Wills, 1985).

A third model, the support seeking triage model (Barrera, 1986), demonstrates theoretical reasoning as to why mixed results are found in the social support research. This model challenges the assumption that all social support is positive. The model shows that the outcome of social support can be both negative and positive, depending on the timing of social support and the way social support is delivered or received. The following examples demonstrate his point. Individuals attend a medical clinic for assistance. The positive outcome is that they receive assistance that results in a favourable medical outcome and has no detrimental effect on their self-esteem. A negative outcome could be a result of the way the medical support is administered (e.g., in a condescending manner), poor medical outcome, or the individuals' interpretations of aid received. Time may also influence the outcome of social support revealing either positive or negative associations. Whereas initially the individuals may have experienced positive feelings from gaining assistance, seeking assistance over a long term may reduce the individuals' self-efficacy in coping. This reduction may result in individuals perceiving themselves as incompetent and may lead to further distress.

*Measurement and Conceptual Issues*

Social support has been conceptualised as embeddedness, perceived support, and enacted support (Barrera, 1986). Embeddedness refers to the connections that individuals have to significant others in their social environments, that is, their networks. Perceived support is defined as the cognitive appraisal of being supported by others. It refers to the individuals' perceptions of feeling supported irrespective of whether support is actually given. Enacted support refers to the actual behaviours or

actions performed when assisting others. Viewing social support from these various perspectives has resulted in different forms of measurement and assessment.

Early measures of social support were based on the concept of embeddedness. Embeddedness contains the assumption that the number of associations an individual has would be indicative of the level of social support. A limitation of these measures, as pointed out by Barrera (1986) and Seeman and Berkman (1988), is that not all linkages involve the provision of social support. Later measures, partially addressed this assumption and took into account the reachability component by summing only the people in contact with the participant (reachability) rather than all those known to, but not necessarily in contact with, the participant. Yet, these later measures, were only partially useful, because network size is still irrelevant, if some people do not actually provide social support or are not perceived to provide support by the participant. Another limitation in the embeddness concept is that networks change over time due to chronic illness, injury, bereavement, or relocation. Thus, a measure taken at any one time, may or may not be related strongly to social support at any other time.

The proponents of the perceived social support construct have suggested that social support can be effective only if the individuals believe that they are receiving social support (Sarason, Shearin, Pierce, & Sarason, 1987). Measures of perceived social support typically ask the respondents to list people they believe they receive support from, and then they rate their satisfaction with that social support. One such measure is the Social Support Questionnaire developed by Sarason, Levine et al. (1983). By assessing the extent of, and satisfaction with, social support, a researcher is able to generate information on questions such as: Does perceived social support

prevent or reduce the time taken to re-enter competition status after being told that the injury is healed? or, Does the perception of high social support reduce the threat or the appraised stressfulness of an event such as progressing through rehabilitation?

Perceived social support is a direct result of the individuals' thoughts or emotions. Individuals who experience crises and feel depressed may not acknowledge support even when it is given. Alternatively people may perceive but not actually receive social support.

The enacted support concept is divided into three main categories: practical, emotional, and informational. Practical support refers to the active assistance given by one party to another. An example is providing a patient with transport to go to the medical clinic. Emotional support refers to the understanding and empathy given by one party to another. Informational support refers to the conveyance of relevant information. A physiotherapist who describes how to perform rehabilitation exercises is providing informational support. The enacted support concept is helpful in a rehabilitation context and its use enables practitioners to identify the most effective type of support (practical, emotional, and informational) needed by patients. A potential limitation to its utility lies with the research design and choice of instrument used. Barrera (1986) and Heitzmann and Kaplan (1988) have provided examples of researchers who have chosen an instrument measuring one category of enacted support (emotional) and then incorrectly interpreted the result as reflecting the total enacted support concept (incorporating the emotional, informational, and practical support dimensions). The studies discussed reported that social support was of no assistance. A

more accurate delineation may have shown that the clients did not find the emotional (as distinct from practical or informational support) aspect of social support helpful.

Early social support instruments used only univariate measures of the construct. As recognition for the validity of all three constructs increased, concern for the lack of convergent validity across measures also increased (Heitzmann & Kaplan, 1988). More recent social support instruments combine perception, embeddedness, and enaction (e.g., The Social Resources and Social Support Questionnaire; Myers, 1996 ). Because there is such a variety of social support constructs Barrera (1986) cautioned researchers to "carefully identify the social support concepts that fit their research questions and to select measures that match these concepts" (p. 410).

*Recovery*

Social support has been examined in relation to physical and mental health conditions including: recovery from drug and alcohol abuse (e.g., MacDonald et al., 2004) and cancer (e.g., Weis, 2003). Due to the physical nature of the injury examined within this study, only those studies relating to physical conditions are reviewed. Some of the most prevalent physical conditions investigated in the literature were bypass surgery (e.g., Kulik & Mahler, 1989), musculoskeletal disorders, orthopeadic injuries (e.g., Ponzer, Molin, Johansson, Bergman, & Tornkvist, 2000; Wilcox, Kasl, & Berkman, 1994), including fractures (e.g., Kempen, Scaf-Klomp, Ranchor, Sanderman, & Ormel, 2001; Mossey, Mutran, Knott, & Craik, 1989; Stevens et al., 2004), joint injuries (e.g., Showalter, Burger, & Salyer, 2000), and osteoarthritis (e.g., Ethgen et al., 2004).

Over the past 30 years, theoretical and strong empirical support has been established for the relationship between social support and positive health outcomes such as preventing or decreasing the likelihood of ill health (Connell & D'Augelli, 1990), coping with set backs and maintaining a more positive mood during rehabilitation (Porritt, 1979), attaining higher functional status and quality of life after injury (Ethgen et al., 2004), and quicker recovery from injury or illness (Anson, Stanwyck, & Krause, 1993; Jenkins et al.,1994; Kulik & Mahler, 1989; La Mendola & Pellegrini, 1979). Although early studies were by and large cross-sectional (Goodenow, Reisine, & Grady, 1990), more recent study designs are longitudinal with large samples (e.g., Kempen et al., 2001; Ponzer et al., 2000).

Ethgen et al. (2004) measured the relationship between social support and health-related quality of life in 108 osteoarthritic participants who attended a physical rehabilitation clinic as outpatients. Outcome measures included dimensions of physical health (e.g., limitations in physical and usual activities due to the arthritic condition) and emotional health (e.g., limitations in physical functioning activities due to emotional ill health and distress). Social support was measured in terms of number of supportive transactions, different types of support, and satisfaction with these transactions. Measuring multiple aspects of social support allowed the researchers to assess the relative importance of each social support measure with the various outcome measures.

Out of the four support dimensions that positively correlated with physical functioning, three were associated with satisfaction. These were satisfaction with daily emotional support, problem-orientated emotional support, and daily instrumental

support. The social companionship transactions positively correlated with physical functioning and was the strongest relationship. On the basis of these results, and more extensive results revealed in the study, Ethgen et al. (2004) suggested that satisfaction with perceived social support may contribute to quality of life to a greater extent than actual supportive transactions.

The Ethgen et al. (2004) study demonstrated the importance of social support on levels of physical functioning, but not rate of recovery. Given the strength of the correlations, and that rate of recovery is associated with feelings of vitality and quality of life, it is plausible that measures of satisfaction and networks may influence rate of recovery. Ethgen's study was conducted with an older population, and there is a need to explore whether similar findings could be generalised to an athletic population.

La Mendola and Pellegrini (1979) found that patients who received and valued a high level of support were less likely to perceive physical limitations after surgery, and were discharged earlier than patients with lower levels of support. Kulik and Mahler (1989) examined the effects of social support on speed of recovery of 72 male patients undergoing non-emergency coronary by-pass surgery. Social support was defined as the number of times spouses visited their partners in hospital. High and low support groups were determined and compared to speed of recovery. Two measures of speed of recovery were used. The first measure monitored the number of hours between the end of the operation and when the person was released to the general ward from the surgical intensive care unit. The second indicator was the total number of postoperative hours spent in hospital. Amount of medication taken, was also used as a measure of overall recovery. Findings showed that married patients who received more

support took less pain medication, and recovered more quickly than their counterparts who received less support. Although using a relatively unobtrusive behavioural measure of spouse visitation, for social support, aspects of social support by spouses who were unable to visit but who phoned daily might not have been recorded. In addition, the recovering spouse may not have perceived the number of visits received as supportive. A multidimensional assessment of social support, perhaps a combination of actual and perceived support, may be more useful.

The positive influence of social support on speed of recovery appears across age groups and across domains. Houldin and Hogan-Quigley (1995) and Magaziner, Simonsick, Kashner, Hebel, and Kenzora (1990) found that social involvement and contact with their social networks following discharge are associated with better and quicker recovery in older adults with hip fractures (approximately 60 years of age and older). Kempen et al. (2001) conducted a prospective study measuring the influence of social support on the short and long-term recovery of 171 middle-aged to older-aged persons recovering from arm, leg, and hip fractures resulting from falls. Results revealed that although social support did not play a role in the short term (8 weeks), it did in the long term (5 - 12 months after injury). Those participants who had higher levels of social support most closely approached their pre-injury functional status.

Successful early return to work has been associated with the provision of specific, practical, and emotional support at work (Johnson, 1987; Wehman et al., 1990). Return to work programs aim to simulate work activity through the provision of practical, emotional, and informational support, and in doing so increase the workers' self-efficacy in aspects of work they will be involved in. Studies assessing return to

work programs revealed that workers who were exposed to social support based programs reported a higher level of people returning to work and maintaining employment, than if not exposed to social support based programs (Landes & Rod, 1992). In addition to work colleagues and medical practitioners, social support from the family is integral to the successful return of the injured worker (Boudrez, De Backer, & Comhaire, 1994; Tate, 1992). Tate found that early return to work, prompt contact with a rehabilitation officer, and consistent contact with medical staff are associated with higher rates of employment retention in injured people returning to work. Despite the endorsement for social support by work colleagues, Schultz et al. (2004) showed that co-worker support, although implicated, was not as strong a determinant of return to work status as expectations of recovery and perceptions of health change.

Social support has been positively associated with recovery among injured athletes (e.g., Johnson, 1997a; Johnston & Carroll, 2000a; Udry, 1997). Inquiry into the efficacy of social support in athletic rehabilitation followed on from the stress models used in studies examining antecedents of athletic injury (e.g., Andersen & Williams, 1988; Weiss & Troxel, 1986) and from the loss of health models (e.g., Kübler-Ross, 1969). Social support positively associated with adherence to rehabilitation (Udry), increased positive mood, or decreased negative mood (Chan & Grossman, 1988; McDonald & Hardy, 1990; Nideffer, 1983; Rotella & Hymann, 1986; Smith et al., 1990; Wiese & Weiss, 1987). Intuitive appeal would suggest that injured athletes, who are more positive emotionally and adhere to their rehabilitation, are more likely to recover from rehabilitation at a faster rate than those with opposite profiles.

Although numerous anecdotal accounts have supported this idea with sport psychologists offering guidelines to create more supportive environments (e.g., Ahern & Lohr, 1997; Lynch, 1988; Richman, Hardy, Rosenfeld, & Callanan, 1989; Wagman & Khelifa, 1996) few studies have examined the relationship between emotion, adherence and recovery. Some studies (e.g., Ievleva & Orlick, 1991; Quinn & Fallon, 2000) that directly examined social support and rate of recovery did not find a strong association between the two variables. In the face of such strong associations between the two variables in the health literature one must question these results. Because the Ievleva and Orlick (1991) and Quinn and Fallon (2000) studies incorporated multiple psychosocial variables of interest to this study they will be reviewed in the multivariate section. (p. 58)

Not all studies have found positive associations between social support and recovery (e.g., Kirk-Sanchez, 2004; Mossey et al.,1989; Wilcox et al., 1994). Wilcox et al. found that at the early stage of recovery from ambulatory surgery, believing in one's ability to cope without the support of others was the best predictor of positive health outcomes. They suggested that the patients, who functioned best without the desire for support, might have established habits of independence that enabled them to function effectively without support. Mossey et al. found that with the exception of the social connectedness variable, all other variables (demographic, treatment, medical, personality) correlated with physical functioning and degree of return to pre-fracture functional status at 12 months. Although the statistical results suggested that social support did not play an important part in recovery and return to pre-fractured functioning, this finding may be reflective of the cohort and the support measure

studied, and not reflective of the wider population. The mean age of participants was 78 and the measure for support assessed number of contacts with special people, friends, or family. It is possible that at that age the availability of networks to call on may differ substantially from a teenager or middle-aged person. More recently, Kirk-Sanchez found that older adults recovering from hip surgery who reported more social support in the form of physical assistance, less negative support in the form of demand and criticism, and less emotional support had more activity limitations two months after discharge than adults who reported less social support. No relationship between social support and activity limitations was identified early in recovery. This study suggested that particular aspects of support may influence the recovery outcomes, at specific times. It is also a reminder not to lump social support into one category

Other studies (e.g., Connell & D'Augelli, 1990; Wilcox et al., 1994) have suggested that the inconsistency in association between social support and rate of recovery may be due to the interaction of moderator variables such as personality. Connell and D'Augelli tested the contribution of personality characteristics to the relationship between social support and physical health. They used structural equation modelling to test a model that depicted the direct and indirect relationships between personality and perceived physical health. A strength of their research is that their design attempted to take into consideration the multifaceted dimensions of social support. Connell and D'Augelli administered three social support questionnaires each focusing on assessing a specific facet of social support: enacted, perceived, and embeddedness. The personality dimensions measured were supportive behaviours such

as affiliation, succourance, and nurturance. Despite having a relatively small sample size, the exploratory and control groups were considered large enough to provide an adequate test of the hypothesised model. The results showed that there were significant pathway relationships between personality (affiliation, succourance, and nuturance), enacted, embedded, and perceived social support. People who perceived themselves to be affiliative, succourant, and nurturant reported larger social networks, reported receiving more supportive behaviours, and reported perceiving more support available to them, than people who did not perceive they had the pre-mentioned personality characteristics. Connell and D"Augelli also found that perceived support associated with perceived physical health. The greater social support individuals perceived they had, the more positively they rated their health. These findings suggest that personality needs to be considered when interpreting results on the influence of social support on health outcome.

*Temporal Considerations*

King, Reis, Porter, and Norsen (1993) used a multifactorial design and assessed time effects, as well as the effect of social support, on emotional and functional outcome after coronary artery surgery. Emotional outcome was measured by mood states and functional outcome by number of disruptions to usual activities such as sleep, social interaction, and recreation. Hierarchical multiple regression was used to assess whether social support accounted for changes in angina and emotional and functional outcome. Social support accounted for only 1% to 6% of the variance in health outcome.

In their examination of older adults with hip fractures, strokes, or myocardial infarctions, Wilcox et al. (1994) found that various aspects of social support functioned differently over time. Number and satisfaction with task support increased from pre-hospitalisation to post-hospitalisation. The number of sources of emotional support increased over the same period, yet despite this increase there was no corresponding increase in adequacy of emotional support. A possible explanation could be that the support given was not as high as that needed by the patient, or that the supportive behaviour was provided at a time of rehabilitation that the patient did not think helpful (Jacobson, 1986). The percentage of people who reported no one to count on for emotional and financial support also increased.

Gordon (1986) suggested that the type of support beneficial for injured athletes might change over time according to the emotional needs of the athletes. Since Gordon, only a few authors have published studies on the temporal aspects of social support for athletes during rehabilitation. Udry (1997) and Quinn and Fallon (2000) will be reviewed in the multivariate section.

Magyar and Duda (2000) used the 6-item Social Support Questionnaire (Duda et al., 1989) to assess the amount of social support perceived to be received by 40 injured intercollegiate athletes. Their repeated measures study revealed that there was little change in the perceptions of amount of support over three time periods. This result should be considered with caution because out of the 40 athletes assessed, 11 were in rehabilitation for only 2 weeks and another 15 athletes were in rehabilitation for only 5 weeks. This short rehabilitation duration could be the reason why the amount of social support did not appear to change over time.

In an earlier study, Johnston and Carroll (1998b) used interviews to obtain social support information on 12 seriously injured athletes. They used an adaptation of Hardy and Crace's (1993) eight types of social support to guide their interviews. Participants were asked to rank the eight types of social support they received, name the support providers, provide the descriptions of how the various types of social support were delivered, and state why the social support provided was important. Participants were chosen from injured athletes who participated in a previous study. Most all interviews were carried out 10 to 30 weeks post injury, and the data were most likely influenced by some memory bias. Although Johnston and Carroll attempted to reduce this memory problem by summarising the points made in the initial interview, caution regarding memory bias must be taken into account. Nevertheless, the study produced one of the most comprehensive examinations of athletic rehabilitation and social support over time.

Johnston and Carroll (1998b) concluded that "the provision of informational and emotional support appeared to be dictated by four temporally sequential appraisals: appraisal of injury severity, rehabilitation progress, recovery and readiness to return, and sports performance" (p. 281). During the time associated with appraisal of injury severity, other injured athletes followed by medical personnel (usually physiotherapists) were the main providers of informational support. The main function of the information provided was to educate the injured athletes about the implications of their injuries. Friends or family members were the main providers of emotional support. Johnston and Carroll identified three functions for emotional support. They were: "(a) acknowledge the existence and severity of the injury, for chronic and acute

injuries, respectively, (b) choose treatment options, and (c) rationalise thoughts and feelings." (p. 277). The main providers of practical support were the individuals who lived with the injured athletes. Practical assistance occurred in the following forms: cutting up meals, helping in getting around, and providing money for taxis.

The middle phase of injury was characterised by an appraisal of injury progress. Johnston and Carroll (1998b) identified physiotherapists as the main providers of informational support, the content of which centred on rehabilitation goals and positive feedback regarding rehabilitation progress. A second function of information support was fitness advice. Coaches, other injured athletes, and sport friends provided this support. The amount of emotional support received diminished in the middle phase of rehabilitation. Although injured athletes said anyone could provide the needed emotional support, the main providers were nevertheless still family and friends. Johnston and Carroll noted that emotional support was still important to athletes with serious injuries who were impatient to return to sport. Most participants reported that emotional support was not needed from the middle to the end of rehabilitation. Practical assistance was reduced by the middle of rehabilitation and considered not necessary by all except by the most severely injured who were still incapacitated. Physiotherapists, team-mates, and coaches provided the main form of informational support during the final recovery and readiness to return phase. Treatment-related advice was motivational and focused on helping the athletes not to return to sport prematurely. Although emotional support was comparatively diminished during this phase, Johnston and Carroll did note that emotional support was needed upon resumption of sport performance.

Given the differences in amount and type of social support over the rehabilitation and recovery period, measuring social support once throughout rehabilitation would obscure real changes in social support. Results may not reflect the amount or type of social support received throughout recovery. Taking multiple measures of social support throughout rehabilitation appears to be a more valid form of measuring potential influences and changes.

### *Coping*

Coping refers to the cognitive, emotional, and behavioural resources individuals use to manage the stressors in their personal and social environments (Lazarus & Folkman, 1984). Various theories have been developed to explain the coping process. The ego-defense mechanism theory posits that coping is a series of intrapsychic processes, such as denial, that protects the individual from external and intrapsychic threat (Haan, 1969; Valliant, 1977). They used a trait approach to define coping as habitual problem-solving thoughts and actions. Magnusson and Endler (1977) have criticised the psychoanalytic ego model of coping on the basis that making reliable inferences about ego-defense mechanisms is difficult. Billings and Moos (1981) added to the criticism by pointing out that the ego approach to coping limits the concept of coping to psychological or emotional equilibrium. In addition, knowing how an individual copes with stress in general may reveal little about how they would cope in a specific situation. Overt problem solving behaviour directed at changing the external stressor, or active attempts to avoid the stressor, is not considered when using the ego approach. These latter issues were addressed through the cognitive-behavioural framework used by Lazarus and Folkman (1984), Folkman and Lazarus (1984, 1985,

1986), and Roth and Cohen (1986). The cognitive-behavioural framework allows the researcher to examine the cognitive, emotional, and behavioural responses to confronting or avoiding a stressor.

The most prevalent coping theory used in health psychology is that of Lazarus and Folkman (1984). Their transactional model of stress and coping differs from other theories in that the coping strategies are derived from the individuals appraisals of the demands and resources in themselves and in the environment. Folkman and Lazarus (1985) also suggested that the person-environment transaction is mutually reciprocal. A change in one factor will alter the nature of the relationship between the two. Change may also result in a different appraisal of the situation, and consequently, different coping strategies. Coping is therefore considered to be an ever-changing process (Folkman, Lazarus, Dunkel-Schetter, Delongis, & Gruen, 1986).

Central to Lazarus and Folkman's (1984) coping theory is the function of cognitive appraisal. They propose two types of appraisals, primary and secondary. In primary appraisal, individuals decide on how they feel about the situations they are confronting. The individuals may view the situations as threatening, beneficial, harmful, or challenging to their well being. For example, injured athletes may assess their injuries as harmful to their sport career, threatening to their status on the team, a challenge to overcome prior to a specific date, or a blessing because they can get out of situations they find aversive. Secondary appraisal involves how to respond to the situation. The choice of response is based on the individuals' assessment of resources and the demands of the environment. Different coping strategies are used depending on whether individuals believe that they have the resources to meet the demands of the

situation. The coping strategies may be cognitively, emotionally, or behaviourally based. An example of a cognitive coping strategy is reframing the threatening situation to make it less threatening. Not acknowledging (denying) the emotions associated with a threatening situation is an example of an emotional coping style. The act of confronting the person or situation that is threatening exemplifies a behavioural coping style.

Lazarus and Folkman (1984) classified coping strategies into "problem" and "emotion" focused categories. Problem-focused coping refers to active attempts at changing the situation to deal with stress. It is used when people believe they can directly influence the situation. Confronting the person or problem, and planful problem solving (e.g., deciding on what to do and then taking things one step at a time), are examples of problem-focused coping. Emotion-focused coping refers to attempts to change or control emotions, or change the way one feels about the stressful situation. Examples of these strategies include distancing, self-controlling, escape-avoidance, and positive re-appraisal. Social support can be used in both problem and emotion-focused coping. People may seek informational support from others to change the situation (problem-focused), seek out people to listen to their concerns and feel emotionally supported by them (emotion-focused), or use a combination of the two.

*Measurement and Conceptual Issues*

Because the transactional model of stress and coping has been the most widely used model in the health literature, it is not surprising that many of the instruments measuring coping styles are adaptations of the original Ways of Coping Questionnaire

(WOCQ; Folkman & Lazarus, 1985). The WOCQ is a 68-item instrument, comprising eight sub-scales: problem-focused, increased effort and resolve, wishful thinking, denial, detachment, general emotionality, emphasising the positive, and seeking social support.

As a result of the limitations of the WOCQ (see Endler & Parker, 1990; Vitaliano, Russo, Carr, Maiura, & Becker, 1985). Vitaliano et al. developed a shorter version of the WOCQ, called the Ways of Coping Checklist (WCCL). The WCCL assesses the way individuals cope with a specific stressor. The 42 items describe a broad array of cognitive and behavioural strategies used to manage stressful situations. These items fall into five sub-scales: problem-focused, self-blame, avoidance, wishful thinking, and seeking social support.

Two sport relevant questionnaires adapted from the original WOCQ, are the Ways of Coping in Sport (WOCS; Madden, Summers, & Brown, 1990) and Ways of Coping with Injury (WOCI; McDonald & Madden, 1991). The WOCS was developed to measure the coping styles used by athletes experiencing competition anxiety. The sub-scales are the same as those used for the WOCQ. Each item was rephrased so as to have relevance in a sport setting. After finding that many of the athletes' stressful situations were brought about by injury, McDonald and Madden embarked on the development of the WOCI (D. McDonald, personal communication, January, 1996). The value of such an instrument is apparent to those interested in injury, but because the eight sub-scales had not been psychometrically tested, when this study was initiated it was not used for this research.

*Recovery*

Coping is positively associated with recovery in a number of health, work, and sport-related studies (e.g., Agren, Ryden, Johnsson, & Nilsson-Ehle, 1993; LaMontagne, Hepworth, Morrey et al., 2004; Marhold, Linton, & Melin, 2001). Some studies examined the effect of only one type of coping on rate of recovery (e.g., Brewin, Robson, & Shapiro, 1982), whereas others compared the influence of various coping styles (e.g., King, Rowe, Kimble, & Zerwic, 1998; LaMontagne, Hepworth, Johnson, & Cohen, 1996; Udry, 1997). Because examining a single coping style provides information only as to the strength of that particular variable's relationship with recovery, a more effective design is to use multiple forms of coping in determining any relationships with recovery. In this scenario the respective strength of association between the coping styles and recovery is obtained. Studies on which coping styles are the best predictors of recovery are inconclusive. Some studies (e.g., LaMontagne et al., 1996; LaMontagne et al., 2004) have demonstrated a stronger positive relationship between problem-focused coping and faster recovery, whereas other studies have found emotion-focused coping to have the stronger positive relationship with recovery (Brewin et al., 1982).

Brewin et al. (1982), Strauss et al. (1992), and Welch (1995) found that the type of coping used by injured workers influenced the speed of their return to work. Brewin et al. grouped 93 male manual workers, who sustained upper and lower limb fractures while at work, into fast and slow recovery groups. The rate of recovery measure was adapted from Allodi and Montgomery (1979). Brewin et al. had two experts in orthopaedics independently estimate the average time off work required by

patients for a particular injury, bearing in mind the workers' occupation. Adjusted rate of recovery was determined by dividing the actual time off work by the mean of the two estimates provided by the orthopaedic specialists. The differentiating point became 1.0. Those workers who scored higher than 1.0 were categorised as returning to work more slowly than expected, whereas workers who scored lower than 1.0 were classified as returning to work faster than expected. Results found that causal responsibility/self-blame upon return to work, was the strongest predictor of recovery rate. Brewin et al. suggested that those who took responsibility for their injuries, by blaming themselves, felt that they owed it to the company to return. They appeared motivated to return out of a sense of guilt. Athletes who see themselves as letting the side down by not participating may possibly use self-blame in a similar manner to those workers in Brewin et al.'s study. Brewin et al. found those people who used more of the emotional coping strategy of self-blame, recovered faster than those who used less of this strategy. But Strauss et al. and Welch found that participants with low scores on depressed coping style, returned to work faster than those with high scores on depressed coping. Welch considered that the workers' more negative perception of the work environment may have led them not to use support resources to return to work. Those workers who described themselves in more positive terms may have placed themselves in a situation whereby they used a greater number of resources.

" A major gap in the coping literature is the absence of studies that measure coping and adaptational outcomes immediately after a stressor (injury, surgery) and again at later times" (LaMontagne, et al., 2004, p. 247).

LaMontagne, et al. (1996) and LaMontagne et al. (2004) filled this gap by examining various types of coping with return to normal activity and rate of recovery in a repeated measures design. LaMontagne et al. (1996) investigated whether preoperative coping had a direct positive effect on return to normal activities. LaMontagne et al. believed that avoidance and vigilant coping could be measured on one dimension. The less vigilant individuals were, the more avoidant they became. Thus after being interviewed, children who were recovering from serious orthopaedic surgery were classified on a dimension of avoidance and vigilant coping. Children's coping responses were then compared to the usual activities scale which was given pre-operatively, 2 days post operatively and 3, 6, and 9 months after discharge. Coping had a positive association on all three post-discharge times. More vigilant copers participated in more activities.

LaMontagne et al. (2004) examined the coping styles of 113 adolescents who were recovering from back surgery. Recovery was defined by the number of new or usual activities conducted. On this occasion assessment times were 1, 6, and 9 months, after surgery. Vigilant pre-operative copers reported engaging in more new and usual activities at the 1-month and 6-month assessment periods than did avoidant copers. After 1 month of recovery, vigilant post-operative copers reported engaging in more new activities at 1 and 9 months, more usual activity at 3 months, and more social activity at 1, 3, and 9 months than did those patients who used an avoidant coping style. These results support those found in the earlier study by LaMontagne et al. (1996). Children who use a vigilant coping style recover faster than those who use an avoidant coping style.

A study examining the effectiveness of coping skills programs found that workers who were taught how to cope with pain or disability returned to work sooner than those who were left to their own coping resouces (Marhold et al., 2001). Patients do not only use coping because they are told that it is beneficial, they actually perceive it to be an important factor in their recovery. Antoniazzi, Celinski, and Alcock (2002) compared injured workers' and health professionals' rating of the psychosocial factors they believed to be the most important to recovery. The 17 psychosocial variables collapsed into categories of *self-responsibility, coping with pain, humour,* and *spirituality.* Staff and patients differed significantly as to the psychosocial variables they thought were important to recovery. Whereas staff rated *self-responsibility* as the most important factor, patients rated *coping with pain* as their top factor, followed by *humour, self-responsibility,* and *spirituality.*

Athletes' coping resources may include the coach, team, and other athletes who have experienced similar injuries. These people could provide various forms of social support, for example, informational, emotional, and practical. Athletes may also have a number of psychological skills that they can call upon as resources to help them manage their rehabilitation and return to sport processes. These include using mental skills (goal setting, imagery, relaxation techniques) and emotional and problem-focused coping (Heil, 1993; Rotella & Heyman, 1986).

Numerous sport psychologists have provided narrative articles on the use of mental training skills in helping athletes progress through rehabilitation, and return to competition with confidence (e.g., Gordon, Potter, & Ford 1998; Lynch, 1988; Wiese & Weiss, 1987). Although there is an increase in the number of studies addressing

mental skills, (e.g., Evans & Hardy, 2002a; 2002b; Theodorakis, et al., 1997), only a limited number of studies have monitored the effectiveness of mental training from the time of injury until return to competition (e.g., Potter & Grove, 1999).

Johnson (1997a) provided some information on the type of coping strategies used by males and females in team and individual sports. He compared 81 long-term injured athletes to a matched group of 64 non-injured participants and found that "being injured resulted in a depressed mood state and in the activation of coping strategies" (p. 367). Team athletes used more passive acceptance type of coping, and individual athletes used more active coping. Johnson related these results to the nature of their training and competitive environments. Team athletes are more likely to rely on their team members, whereas individual athletes may not necessarily have a support system around them, and may benefit from actively engaging in obtaining such support.

The majority of studies measuring coping and rate of recovery in athletic injury have assessed the use of mental skills as coping strategies (e.g., Durso-Cupal, 1996; Ievleva & Orlick, 1991; Loundagin & Fisher, 1993; Potter & Grove, 1999) rather than directly measuring the coping styles used (e.g., Quinn & Fallon, 2000; Udry, 1997). In a follow-up study to Ievleva and Orlick, Loundagin and Fisher (1993) found that athletes who healed more slowly than expected reported using fewer mental skills than those who healed faster than expected. Attentional control, goal setting, imagery, self-talk, and relaxation were the mental skills examined; of these, the most used mental skills were attentional control, imagery, and goal setting. Ross and Berger (1996) examined the influence of stress inoculation therapy (Meichenbaum, 1985) on

60 male athletes recovering from knee surgery. The athletes were randomly assigned to two groups: intervention and control. The intervention group returned to normal function quicker than those in the control group. The intervention group also demonstrated less post-operative pain and anxiety during rehabilitation. Durso-Cupal examined the effects of imagery and relaxation (coping strategies) on athletes' recovery from knee injuries. She concluded that athletes who received psychological interventions, such as imagery and relaxation, reported decreases in injury anxiety, greater control over recovery, and faster return to physical activity.

Potter and Grove (1999) examined the influence of mental skills (imagery, goal-setting, relaxation, positive self-talk) on the physical recovery of athletes with grade 2 ankle sprains. They used a matched-pair design with one of each pair undergoing a mental skills intervention program. There were a total of eleven rehabilitation sessions over a 5 to 6-week period, after which all participants had fully recovered and had received permission to return to sport. The mental skills part of the intervention began in the fourth session. Physical recovery was measured by physiotherapists who based their ratings on range of motion and a functional recovery index. No differences were found between control and intervention participants in terms of physical recovery. That is, they all recovered to a level that enabled them to return to sport. A difference between control and intervention participants was found in terms of rate of recovery. Participants who were exposed to the psychological intervention recovered sooner than their matched controls.

More recently de Heredia et al. (2004) examined the influence of perceptions, mood, and adherence on rate of physical recovery and sporting recovery. Physical

recovery was defined as the time from which injury occurred to when the athletes were medically fit to return. Sporting recovery covered the period of return (medically fit) to participating at a level consistent with previous performances. de Heredia et al. examined the responses of 20 injured amateur soccer players who sustained a variety of injuries. An injury had to be moderate to serious, and this was defined as requiring an estimated recovery period of more than 15 days. Quicker return to sporting recovery related to positive estimation of the seriousness of their injuries, lowered fear of injury relapse, lowered tension levels, and better adherence. Although not necessarily comparing coping styles, de Heredia et al. demonstrated an association between emotion-focused coping (positive estimation of injury) and recovery.

Morrey et al. (1999) conducted a prospective longitudinal study that examined the influence of psychosocial variables on physical recovery from anterior cruciate ligament (ACL) surgery. Participants were classified into two categories: competitive ($n$ = 10) and recreational ($n$ = 17) athletes. The recovery outcome was based on range of motion and a physician-rated level of recovery. Five levels of function were used, ranging from level 1 (the most limited range of movement) to level 5 (return to full function without limitations). The psychosocial variables were mood and pain coping. Mood disturbance and pain coping were found to predict rate of recovery at 2 weeks and 2 months into rehabilitation. Coping was not predictive of 6 month recovery. This information, combined with their finding of mood disturbance early in recovery, suggests that emotions and coping may have different influences on rate of recovery at different times in the rehabilitation process. Competitive athletes attained greater recovery 6 months after surgery than recreational athletes whose mood disturbance was

lower. It is possible that other factors such as motivation, social support, and physical fitness may have influenced these results. This study revealed useful results worthy of replication with larger participant numbers. Coping and social support are frequently examined in the same study. Examples of such studies (Johnston & Carroll, 2000; Quinn & Fallon, 2000; Udry, 1997) are included in the multivariate section of this chapter (p. 58).

*Temporal Factors*

A number of studies have found changes in the type and amount of coping strategies used during the rehabilitation process (e.g., Crumlish, 1994; Harper, 2001; LaMontagne et al., 2004; Redeker, 1992). LaMontagne et al. found a significant effect for time. Coping became slightly more vigilant from the pre-operative measure to the day 4 post-operative measure. After 1 month, a drop in vigilance was noted. Avoidant coping increased between the day 4 measure and the 1 month post-operative measure. Redeker administered the Revised Ways of Coping Checklist (Vitaliano et al., 1985) to 129 patients recovering from coronary artery by-pass surgery and found the coping styles most frequently used were seeking social support, followed in descending order of frequency by problem focused, wishful thinking, avoidance, and self-blame. She noted an overall decrease in use of coping between 1 to 6 weeks after surgery. In another study, Crumlish (1994) found that 120 participants, who also had bypass surgery, decreased their use of social support, blaming, and wishful thinking, and maintained their use of problem-focused and avoidance styles. Unlike Redeker, who assessed the coping styles over 6 weeks, Crumlish assessed the use of coping styles over the five days after surgery.

The above studies support the contention that as the person-environment situation changes, individuals may appraise the demands and their resources in a different ways and consequently, may arrive at different coping strategies. For instance, when individuals are first injured and are physically immobilised they may perceive that their own coping resources are low and that they need practical support from others. As the injury heals, and they become more physically capable of looking after themselves, they may believe their own resources are greater, and thus, they do not need to seek out as much practical support as previously. Because the rehabilitation duration of athletic injuries is usually more than a week, time-based differences in coping are probable. Identifying the coping strategies used at particular points in rehabilitation, for example, upon injury, midway through rehabilitation, and on return to sport is warranted.

Striegel et al. (1996) described differing psychological treatment they thought athletes who sustain short-term and long-term injuries would require. They suggested that the severity of the injury and time needed for rehabilitation, calls for various forms of treatment and methods of coping. Striegel et al. suggested that the main concern for athletes with short-term injuries (0 - 2 weeks) is stress associated with the event. Ideally, coping would centre around understanding the injury process and learning stress management techniques. Striegel et al suggested that athletes undertaking long-term rehabilitation (> 2 weeks) would have to consider issues of motivation and lack of social support. Providing goal setting and social support, in addition to ongoing stress management techniques, are suggested ways of increasing coping resources. Finally, if the injury is so severe that withdrawal from sport is required, then career

counselling, in addition to the coping techniques previously mentioned, may be helpful. This model for treatment was based more on theoretical models and needs further testing in real-world environments. Johnston and Carroll (2000), Quinn and Fallon (2000), and Udry (1997) have conducted related studies that assessed the temporal qualities of coping. Because the designs of their studies included other psychosocial variables examined in this paper, their studies are reviewed later (p. 58).

### *Daily Hassles*

Stress has been often measured by the number of life events encountered by individuals within a given time frame (Dohrenwend & Dohrenwend, 1974). Health researchers have suggested that the stress resulting from life events would affect health outcome and recovery (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982). Although this type of stress has been a useful variable to examine, the life event approach to measuring stress does not to take into account the various minor events that may influence individuals' appraisals and coping processes. Life-event measures also limited the type of analyses that could be conducted in rehabilitation. Without having multiple stress assessment points throughout the recovery phase of rehabilitation, health researchers were unable to measure accurately the changes in stress throughout the rehabilitation period.

An alternative to the life-event approach to measuring stress was needed, and the daily hassles construct and measurement was developed. Numerous studies within the health literature found daily hassles: (a) a better measure of stress than life event measures (e.g., Chamberlain & Zika, 1990; DeLongis et al., 1982; Jandorf, Deblinger, Neale, & Stone, 1986; Kanner, Coyne, Schaefer, & Lazarus, 1981; Wagner, Compas,

& Howell, 1988; Weinberger, Hiner, & Tierney, 1987) and (b) a better predictor of health outcome than life events (e.g., Brosschot et al., 1994; Fernandez & Sheffield, 1996; Klemm, 1994; Monroe, 1983; Savery & Wooden, 1994; Williams, Zyzanski, & Wright, 1992).

Daily hassles are minor stressors that have been appraised by individuals as salient, harmful, or threatening to well being (Lazarus, 1984). Daily hassles are part of everyday transactions with the environment (Kanner et al., 1981). It is the measurement of everyday transactions that makes daily hassles a more suitable variable than life events to assess stress in people undergoing rehabilitation from injury than assessing life events. Minor hassles, such as fulfilling daily errands, getting to and from rehabilitation, and working towards achieving more strength and range of motion, can be measured over multiple points throughout rehabilitation. Life-event scales, by their nature, are unable to measure such discrete stressors. In the injury rehabilitation context, measures of daily hassles provide researchers with more current and relevant information than do life-events measures. Given this temporal quality of daily hassles measures, within-group designs can be used over a meaningful timeframe to explore changes in stressors for patients with acute or chronic conditions.

Brosschot et al. (1994) added to the rationale as to why daily hassles are more useful to assess than life events. They explained that "minor everyday stressors have a cumulative impact that is greater than that of discrete major events" (p. 221). In an injury rehabilitation setting, ongoing emotional and physical stressors may be more stressful than the event of the injury itself. They also explained that "hassles are less readily coped with than life events because their very nature [unpredictable, diverse,

and constantly re-occurring] makes them uncontrollable" (p. 221). If the minor hassles experienced by people rehabilitating from injury were not captured then a clearer picture of the stress experienced by them would be lost. A number of minor hassles scales, depicting the specific hassles thought to be experienced by the population being measured, have been developed (see below).

*Measurement*

Lewinsohn and Talkington (1979) developed one of the first instruments that measured minor events. The 320-item instrument measured daily unpleasant events. Lewinsohn and Talkington used this measure to explore the relationship between minor hassles and depression. They found a low to moderate relationship between their measure of unpleasant events and depression. People with more minor events were more likely to score higher on their depression measure. Lewinsohn and Talkington did "not make a strong theoretical case for the advantages of assessing relatively minor stressful events . . . as compared to life events" (Kanner et al., 1981. p. 5), nor did they consider the importance of the cognitive approach to dealing with stresses. Kanner et al. did both. They considered minor stressful events meaningful and emphasised the importance of the cognitive approach when dealing with stress. Because the theoretical underpinnings of this thesis relate most closely to the approach held by Kanner et al., their scale was considered for use in this study.

The original Daily Hassles Scale (DHS; Kanner et al., 1981) consisted of 117 items generated from the following areas: work, health, family, friends, environment, practical considerations, and chance occurrences. Initial convergent validity for the hassles scale was obtained through the scale's relationship with the Hopkins Symptom

Checklist (HSCL; Derogatis, 1977) and the Bradburn Scale (Bradburn, 1969). The relationship between the DHS and the Bradburn Scale showed that hassles were positively related to negative affect, and the relationship between the DHS and the HSCL revealed that greater hassles were related to greater psychological symptoms. In an attempt to further understand the relationship between hassles, life events, and health outcome, DeLongis et al. (1982) used the DHS to explore the associations between the hassles variables and health outcome. After finding that frequency of hassles correlated significantly and negatively with both initial health status and final health status, DeLongis et al. entered the hassles and life event variables into a regression equation. Hassles contributed significantly to the prediction of health status, even when life-events were entered first. The DHS is a useful measure of minor events that could be applied to health situations for the following reasons: (a) the DHS was found to be a better measure of stress than life events, (b) the DHS correlated strongly with adaptational outcomes such as psychological symptoms (DeLongis et al.), and (c) items on the scale were generated with health situations in mind (Kanner et al.).

Since the development of the DHS, a number of studies (e.g., Dailey, Bishop, Russell, & Fletcher, 1990; De Maio-Esteves, 1990; Fernandez & Sheffield, 1996; Holroyd et al., 2000; Kroencke & Denney, 1999; Lau, Hui, & Lam, 1996; Tatrow, Blanchard, Hickling, & Silverman, 2003) have used the DHS or DHS-R (DeLongis, Folkman, & Lazarus, 1988) to assess the relationship between hassles and health outcomes. In all the studies cited above, hassles correlated with the variety of health outcomes measured. Participants who reported greater numbers of headaches or greater

severity of health conditions such as fibromyalgia, multiple sclerosis, or atypical chest pain also reported greater hassles frequency, intensity, or both.

Dohrenwend, Dohrenwend, Dodson, and Shrout (1984) claimed that the items on the DHS were contaminated by distress variance. They argued that the format of the questions did not allow respondents to indicate that they experienced a hassle but did not find it distressing. This limitation was addressed in the shortened form of the DHS called the Revised Daily Hassles Scale (DHS-R; DeLongis et al., 1988). Question format was designed to allow for a *not applicable* score to be ticked. Questionnaires, especially those used repeatedly in within-group designs, need to be as short as possible, without reducing the validity and reliability of the measure, to maintain respondent compliance. The adjustment for distress and the length of the DHS-R, 53 items, make the DHS-R a useful scale for this study.

Since the publication of the original hassles scale, other minor event scales have been developed. They include the Children's Hassle Scale (Kanner, Harrison, & Wertlieb, 1985), the Minor Life Events Scale (Monroe, 1983), and the Everyday Problems Scale (Burks & Martin, 1985). In order to collect meaningful data, specificity of assessment questionnaires to the populations studied is needed. This statement is supported by Blankstein and Flett (1992), who argued that there were important differences in the hassles experienced by various populations, and that measures of hassles should be constructed specifically for the particular population studied. Hassles scales specific to various populations have been developed. Examples include the Caregiving Hassles Scale (Kinney & Stephens, 1989), the Nursing Home Hassles Scale (Stephens, Ogrocki, & Kinney, 1991), and the Computer Hassles Scale (Hudiburg

1995). Hanson, McCullagh, and Tonymon (1992) modified the Everyday Problems Scale to create a measurement instrument suitable to use with a college athlete population. To date, however, no hassles scale for athletes rehabilitating from injury has been constructed. This limitation means that the central hassles experienced by injured athletes may not be captured in extant scales. The Daily Hassles Scale-Revised (DeLongis et al., 1988) was chosen to be used in this study because it was relatively short and had strong reliability and validity co-efficients.

*Recovery*

Two main findings have been replicated in a number of studies that have examined the influence daily hassles has on health outcome. First, daily hassles are predictive of mental and physical health, and second, daily hassles are associated with the duration, and the quality of recovery from illness or injury (Brand, Hanson, & Godaert, 2000; Brosschot et al., 1994; DeLongis et al., 1988; Von Weiss et al., 2002). The most common measures of health outcome used in studies are: frequency of reported conditions, for example headaches (De Benedittis & Lorenzetti, 1992; Fernandez & Sheffield, 1996), frequency of attendance at medical clinics (Williams et al., 1992), and degeneration of specifics condition (Klemm, 1994).

Stress is known to affect health outcome through its influence on the immune system (Brosschot et al., 1994). DeLongis et al. (1988) examined the association between daily hassles and stress among 75 married couples over a 6-month period. They found a significant positive relationship between hassles and concurrent and subsequent health problems such as influenza, sore throats, headaches, and backaches. On the basis of these findings, DeLongis et al. suggested that daily hassles may

indirectly influence rate of recovery from injury or illness by influencing mood and depressing the immune system.

Brosschot et al. (1994) used changes in the cells of the immune system (monocytes, T-lymphocytes, HLA-DR+ cells, and NK cells) as health measures. Both daily hassles and life events were used as measures of stress. Participants were 86 educators with teaching loads of 20 hours or more. The overall findings demonstrated that daily hassles affected health outcome by increasing the potential severity and frequency of stress. The demand on the body's resources (to adjust to stress) is greater when individuals experience a larger number of hassles. Fewer resources to resist illness, or to enhance recovery from illness or injury, would therefore be available.

Brand et al. (2000) used daily hassles to measure the effect of high and low stress on overall health outcomes. In so doing, they verified the relationship between high stress levels and poor health outcomes. The Ursin Health Inventory (Ursin, Endresen, & Ursin, 1988) was used to assess health outcome. The questionnaire measured health problems such as the common cold, influenza, and headache. Despite having only 12 participants in each of the high and the low stress groups, results showed that participants with higher daily hassles had poorer health outcomes.

Hassles may also influence the duration of recovery through their effects on rehabilitation adherence. For example, people who consider scheduling treatment into their lives a hassle (Fields, Murphey, Horodyski, & Stopka, 1995) people who have a general distrust of the medical profession, and who are concerned about everyday hassles, the cost of their treatments, and the difficulty in obtaining medications (Bender & Bender, 2005) are less likely to adhere to treatment. On the other hand, people who

tolerate the hassles that often occurs around rehabilitation are more likely to adhere to treatment (Fisher et al., 1988) and receive the necessary treatment for full recovery within a minimum time-frame.

Hassles associated with injury and injury recovery may also result in psychological responses that include negative intrusive thoughts and avoidance behaviours (Granito, 2001). These psychological responses have been associated with poor adherence levels (Brewer 1998; Daly et al., 1995; Taylor & May, 1996), which may in turn affect the duration of recovery. Given that individuals' responses are influenced by their perceptions, the perception of hassles surrounding injury and the rehabilitation process is important to examine

Fernandez and Sheffield (1996) found that although both the frequency and intensity of headaches were significantly predicted by the amount and severity of hassles, it was the perception of the severity of hassles that best predicted the headaches. Those participants who perceived their hassles as less severe reported fewer and less intense headaches. A study by De Benedittis and Lorenzetti (1992) also demonstrated that the perception of the severity of hassles played an important role in headache occurrence. De Beneddittis and Lorenzetti hypothesised, and found, that patients with "chronic headaches are characterised not so much by exposure to a chronic surfeit of inherently major life events, as by a tendency to appraise cognitively and emotionally any ongoing minor strain or daily hassle as being more arousing or impactful than those who remain healthy" (p. 36). On the basis of this finding, it could be argued that the cognitive and emotional patterns that influence appraisals are more important than the actual amount of hassles to which people are exposed. Athletes who

have appraisal and coping skills that help reduce their perceptions of stress may be buffered from the influence of hassles. Later studies by Klemm (1994), Ravindran, Griffiths, Waddell, and Anisman (1995), and Von Weiss et al. (2002) contributed to this idea by demonstrating that social support and coping style modified the effects that daily hassles have on health outcome. These interactions are discussed in the multivariate section of this thesis.

Ivancevich (1986) and Savery and Wooden (1994) have shown that daily hassles are associated with health outcome in workers from various industries. They found that the greater the hassles, the greater the likelihood of injury. Indirect evidence suggested that return to work occurred sooner when injured workers faced fewer hassles during their return-to-work period. An aim of the return-to-work program in the study by Landes and Rod (1992) was to minimise the number of transition hassles injured workers went through as they regained previous skills, or acquired new skills, on their way to full-time employment. The reduction of such hassles occurred by teaching, in a graduated manner, coping techniques and motor skills specific to their line of work. Another method used in return-to-work programs is to train and encourage other employers and employees to provide support. Organisations that used such supportive approaches succeeded in both lowering hassles and returning the injured workers to work earlier than workers who were not in such programs (Landes & Rod). If daily hassles increase the injured athletes' stress and prolong recovery, teaching athletes how to reduce or manage their hassles might result in quicker return to sport.

Studies on daily hassles and sports rehabilitation are limited (e.g., Granito, 2001; Quinn & Fallon 2000). Nevertheless, some useful information can be gleaned from studies that examined daily hassles as predictors of sports injury (e.g., Blackwell & McCullagh, 1990; Hanson et al., 1992; Smith, Smoll, & Ptacek, 1990; Williams, Tonymon, & Andersen, 1991).

Williams et al. (1991) did not examine rehabilitation processes, but they demonstrated that high total life events and daily hassles led to increased anxiety and potentially stress-related injury. If, as Williams et al. suggested, daily hassles lead to increased anxiety, then it is plausible to hypothesise that during rehabilitation injured athletes experiencing many daily hassles would feel higher levels of anxiety than those athletes who experience less daily hassles. Physiological and psychological correlates of anxiety may interfere in the optimum recovery process of the rehabilitating athletes.

Granito (2001) used a focus group method to interview injured athletes ($n = 7$) and student athletic trainers ($n = 8$) about athlete responses to injuries. In the process, they identified several daily hassles experienced by rehabilitating athletes. These hassles could eventually be used as the basis for an athletic rehabilitation hassles scale. All the athletes interviewed about their emotional responses to injury acknowledged daily hassles as features of their rehabilitation. Examples of daily hassles were: getting around on crutches, trying to focus at school, experiencing disruptions of daily tasks, and avoiding activities that might re-injure or aggravate the current injury. The study, however, had several limitations. The cohort was small. Some participants provided retrospective data, whereas other participants were in the middle of their injury rehabilitation experiences when interviewed. The participants had similar injuries, and

it is possible that athletes with different injuries would display different sets of concerns. Despite these limitations, the results of Granito's focus groups showed the importance injured athletes and athletic trainers place on daily hassles. Quinn and Fallon (2000) considered the influence of daily hassles on recovery time. Their work will be discussed in the section on multivariate studies (p. 58).

Further research into daily hassles and athlete rehabilitation is warranted. For instance, identifying hassles could provide the basis for a specific daily hassles questionnaire for rehabilitating athletes. The measure could then be used to explore the various forms and levels of stressors experienced by athletes in different sports (team, individual), various levels (club, national, international), or by athletes with different types of injuries. Identification of salient stressful issues could assist practitioners in developing programs to help athletes better manage the rehabilitation and return to sport experience.

## *Self-efficacy*

### *Conceptual issues*

Self-efficacy has been defined as the belief one has in one's ability to accomplish a particular task or activity (Bandura, 1977). The self-efficacy, appraisal, and coping model (Folkman et al., 1991) suggested that self-efficacy influences the appraisal process, the choice of coping style, and the resultant behaviour such as adherence to rehabilitation. Folkman et al. suggested that individuals with high self-efficacy were more likely to believe that they could change a situation, and because of this belief they would tend to use problem-focused strategies. People with lower self-efficacy were less likely to believe they could change a situation, and

therefore, they were more likely to use emotion-focused strategies (Donahue-Colletta, Hadler, & Gregg, 1981; Stevens & Pihl, 1987).

Bandura's theory (1982, 1986, 1997) proposed that weaker perceptions of self-efficacy decreased the certainty individuals had about accomplishing activities. People were more likely to avoid rather than confront a situation if they had considerable doubts about their abilities to carry out the tasks. The combination of higher emotional arousal and lower self-efficacy may foil peoples' abilities to focus clearly, to maintain intensity, and to persist with effort. The same combination of higher emotional arousal and lower self-efficacy could result in higher levels of anxiety and depression (Bandura, 1982). Athletes who perceive their injuries and rehabilitation processes as stressful, and have doubts about their ability to manage the demands of rehabilitation, may therefore not adhere to the prescribed rehabilitation. Consequently, these athletes may reduce their chances of quick and successful recoveries (Marks, 2001).

Level of self-efficacy influences coping and adherence (Marks, 2001), also the rehabilitation environment may have an impact on the level of self-efficacy. Bandura's theory suggests that four factors contribute to the development of strong self-efficacy. They are successful performance, vicarious experience, verbal persuasion, and positive emotional arousal. A multitude of factors could contribute to lowered self-efficacy in the rehabilitation environment. These include: numerous unsuccessful attempts at achieving a rehabilitation goal, lack of advice, lack of emotional support that meets the needs of the injured athletes, increased emotional arousal involving fear of re-injury, or loss of team position. An opposite profile to this one may lead to an increase in

self-efficacy. Self-efficacy, therefore, influences coping and adherence or is influenced by the rehabilitation environment. Either way, self-efficacy plays a significant role in the recovery process.

*Recovery*

A major variable associated with myocardial infarction rehabilitation (Allen, Becker, & Swank, 1990; Gillis, 1993) and orthopeadic recovery (Waldrop, 2000; Waldrop, Lightsey, Ethington, Woemmel, & Coke, 2001) is self-efficacy. Gillis tested the effect that self-efficacy had on patients' ability to manage the psychological and physical factors associated with functional behaviours (e.g., walking) after surgery. They found that patients who received a psycho-educational intervention aimed at increasing self-efficacy reported significantly greater expectations for walking. Patients exposed to the intervention also achieved higher levels of performance in walking than the control group. Allen et al. examined the physical, social, and leisure functioning of 125 men who had coronary bypass surgery. They found that self-efficacy, defined as an estimation of one's ability to carry out specific activities, was the most substantial predictor of functional health status. Self-efficacy independently explained 24% of the variance in social leisure function and 20% of the variance in intermediate activities of daily living. Waldrop (2000) and Waldrop et al. (2001) also found that self-efficacy had a beneficial effect on recovery. The results of these studies conducted on older age groups suggested that the benefits of self-efficacy cross age groups.

Sport psychologists have advocated the use of psychological techniques such as affirmations, time-projected imagery, and effective goal setting to increase the athletes' self-efficacy regarding rehabilitation tasks and recovery (e.g., Hardy, 1992; Wiese &

Weiss, 1987). The majority of studies conducted on confidence and sport rehabilitation involved examining self-efficacy in relation to rehabilitation adherence. Athletes who believed more strongly in the efficacy of their treatments had greater confidence regarding their ability to manage the demands of rehabilitation (Rabaglietti, Ruggeri, Mosca Barberis, & Ciairano, 2002; Taylor & May, 1996), placed more emphasis on task-involved goals, and displayed higher rehabilitation adherence levels (Duda et al., 1989; Magyar & Duda, 2000). Although extensive empirical evidence supported the tenant that confidence influenced rate of recovery, few studies directly assessed the association between self-efficacy and rate of recovery within athletic populations. Even fewer studies have documented whether self-efficacy fluctuated or remained stable throughout rehabilitation. Among other psychological variables, Quinn (1996) documented the changes in self-efficacy throughout rehabilitation. This paper is referred to in the following multivariate section.

*Multivariate Studies Examining Recovery from Injury*

Some of the previous studies used single variables to examine the effects and associations of psychosocial factors on recovery from injuries (e.g., King et al., 1993; Wilcox et al., 1994), whereas other studies used multiple variables (e.g., Ethgen et al., 2004; LaMontagne et al., 2004; Mossey et al., 1989). These latter studies demonstrated the associations between the variables and provided information as to which variables, if any, were better predictors of recovery. The following studies have explored more than one of the psychosocial factors examined in this thesis. They are reviewed here to demonstrate the way combinations of variables may have different influences.

Two studies (Ievleva & Orlick, 1991; Quinn & Fallon, 2000) have explored psychosocial variables and rate of recovery within an athletic population. In the first study of its kind, Ievleva and Orlick examined whether psycho-social factors thought to enhance healing influenced rate of recovery in athletes who had grade 2 ankle injuries and knee injuries (medial collateral ligament sprains). Psychosocial variables explored included social support, positive self-talk, goal setting, healing imagery, stress, attitude, and outlook. Quantitative and qualitative questions were asked. Rates of recovery and group membership were obtained by ranking all athletes according to the number of weeks taken to achieve 85-90% recovery. Participants were then divided into three recovery groups: slow, average, and fast. Recovery took anywhere between 4 and 20 weeks. Athletes who recovered in 5 or less weeks were allocated to the fast recovery group and athletes who took 12 weeks or more to recover were allocated to the slow recovery group. Athletes who recovered in over 5 weeks, but less than 12 weeks were allocated to the average recovery group. The *t* tests were conducted between fast ($n = 6$) and slow ($n = 10$) groups.

Comparison between fast and slow recovery groups revealed significant differences on the following variables: goal setting, positive self-talk, and healing imagery. The effect size for outlook, attitude, social support, and stress variables were extremely small. Although *t* tests failed to discriminate between fast and slow groups in terms of social support, differences were found in the responses to the qualitative questions that asked athletes to describe the kind of support they had, if any, and from whom. Ievleva and Orlick (1991) stated that the differences detected ranged from describing support as "superficial – assisting with chores" to "emotional support and

encouragement." (p. 34) They did not, however reveal which group indicated more superficial or more emotional support. The inclusion of both quantitative and qualitative questions was a strength of the study, because athletes were able to describe in more detail the support experiences that were missed by the social support questionnaire.

Ievleva and Orlick (1991) reported that greater use of positive self-talk, goal setting, and visualisation were associated with the fast recovery group. From the perspective of a practitioner, this finding seems important because such coping resources are trainable skills. Although the quantitative item on positive attitude did not produce significant differences and the effect size was low, qualitative results indicated otherwise. The slow recovery group had the least positive responses, the average recovery group had a combination of both positive and negative responses and the fast recovery group had the most positive responses. The responses of the fast group were described as more internal in nature and "indicative of more personal control over their bodies and themselves" (p. 33).

Despite providing practical information, a number of design shortcomings suggest that the results of Ievleva and Orlick's (1991) study should be read with caution. Athletes were administered the questionnaire between 1 to 2 months after they recovered from injury. Memory lapses or biases, could have played a significant role. The small sample sizes also mean that power was an issue, and Type II errors were probable.

Larger participant numbers were used in another study (Quinn & Fallon, 2000) that examined athletic injury and recovery times. Quinn and Fallon explored the

influence of multiple psychosocial, medical appraisal, and demographic variables on the recovery time of 136 elite athletes rehabilitating from injury. Recovery time was measured by the actual number of weeks the athletes were injured and unable to play at full participation. Rate of recovery was measured by comparing the athletes' actual recovery time with the medical staffs' expectations of their rehabilitation duration. Athletes who recovered sooner than expected were classified as fast recoverers. Psychosocial variables included self-efficacy, mood states, daily hassles, social support, coping, and motivation. Variables were assessed at four phases throughout rehabilitation: as soon as possible after the injury and medical appraisal, partial recovery (approximately one-third of the recovery time), semi-recovery (approximately two-thirds of the recovery time), and upon return to full training. Quinn and Fallon used hierarchial regression procedures to examine the additive influence of predictor variables on recovery time. When at phase four, all variables were entered into a hierarchical regression, five predictor variables explained 56% of the variance in recovery time. Variables that predicted recovery time were (a) team (e.g., basketball) versus individual (e.g., tennis) athlete status, (b) non-sport versus sport injury, (c) vigour, (d) intensity of effort, (e) confidence. No medical appraisal variables were identified as predictors of recovery time. Social support, coping, and self-efficacy predicted recovery at various phases of rehabilitation.

Being a member of a team was associated with faster recovery time at all phases. Quinn and Fallon (2000) suggested that this result was due to the greater number of resources available to the team athlete, than to the individual athlete. Coping emerged as a predictor of recovery. Active coping positively associated with recovery

at phase 2, and denial/emotion-focused coping predicted recovery at phase 3. The use of both active and denial/emotion-focused coping is understandable. Athletes increase their need for information, advice, and planning to manage their injuries. Athletes with greater use of denial/emotion-focused strategies recovered faster at phase three than athletes who used less denial/emotion coping. Presumably denying their injury allowed the athlete to get on with the task of rehabilitation. Social support correlated with partial recovery at phase 2 in a surprising way. At phase 2, athletes who displayed less social support, were rated by medical staff at a more advanced level of healing than athletes who displayed more social support. Quinn suggested that although social support may be important to the well-being of athletes, social support may not necessarily assist athletes with their rehabilitation. The Social Support Behaviours Survey (Richman, Rosenfeld, & Hardy, 1993) which Quinn and Fallon used, had the potential to distinguish between various types of social support, yet data in their study were collapsed into one variable – a total satisfaction score. Collapsing the data into one total score may have obscured other meaningful associations or at least clouded the findings on social support. Another limitation was the use of a social support questionnaire that had reported low reliabilities. Given these findings, further examination of the influence of social support is warranted.

Other psychosocial factors that predicted recovery were self-efficacy and general confidence. Athletes with greater self-efficacy in reaching full recovery within the estimated time were rated by medical staff as being at a more advanced level of recovery at phase 2, than athletes who reported less self-efficacy. Athletes with greater general confidence were rated by medical staff as being recovered and able to return to

competition earlier, than athletes who reported less confidence. Daily hassles did not emerge as a predictor of recovery at any time. Quinn and Fallon (2000) suggested that this result might be because the hassles scale did not pick up the unique stressors that rehabilitating athletes might experience.

In an earlier study using the same participants, Quinn (1996) assessed the changes in the psychosocial factors over recovery time. Rather than an expected increase in self-efficacy over time, self-efficacy remained stable or even decreased. Quinn used two 1-item scales to assess self-efficacy in adhering to rehabilitation and self-efficacy in recovering within the estimated time given by doctors. These self-efficacy questions were administered only during phase 1 to phase 3. Phase 4 (full recovery) was omitted and meaningful data may have been lost as a result. Her explanation of the results suggested that athletes' expectations play a role in levels of self-efficacy. She pointed out that athletes expected to recover within the time frame given by the doctors. The doctors' estimated recovery time lines were shorter than actual recovery times. When the athletes drew closer to the time of recovery, and had not yet recovered, they began to doubt their ability to recover at the expected time.

Quinn (1996) also found that athletes had experienced decreases in daily hassles from the partial recovery ($M = 53.9$) to the semi-recovery phase ($M = 47.9$). Quinn's results demonstrated a significant increase in active coping between time 2 and time 3. This time effect, however, accounted for only 3% of the variance in recovery. No other time effects were identified for the coping factors. Satisfaction with social support remained stable over time. Quinn suggested that an explanation for the stable results in social support satisfaction could lie within the characteristics of the

group examined. Udry (1997), who examined the use of social support and coping over rehabilitation time, also found social support to be stable. In their respective studies, both Udry and Quinn explained their results by stating that athletes may have had organised support networks that were stable over time and consequently resistant to additional stress. Udry (1997) and Johnston and Carroll (2000) also employed a repeated-measures design that enabled the temporal effects of psychosocial variables within rehabilitation to be assessed.

Udry (1997) examined the influence of coping and social support on adherence to rehabilitation levels of 25 athletes recovering from knee surgery. Measures were administered on five occasions: pre-surgery, 3, 6, 9, and 12 weeks post surgery. Although Udry did not examine the coping and social support variables in relation to rate of recovery, the time effects found provide useful data that could be applied to the way these variables operate in injury settings.

Significant changes in two types of coping: palliative and negative emotion coping were identified. Palliative coping (a variety of self-help activities and responses employed to alleviate the unpleasantness of a health problem, such as getting additional sleep) was found to increase significantly from pre-surgery to 3 weeks post-surgery and decreased significantly from 3 weeks to 6 weeks post-surgery. Palliative coping remained stable between 9 weeks and 12 weeks post-surgery.

The finding that self-help activity increased during the early acute stage of the injury and then decreased as injuries healed, is not unexpected. It is understandable that more resources are called upon when unpleasant situations are highest and are decreasingly sought as the unpleasant conditions decrease. Negative emotional coping

involves a pre-occupation with the emotional consequences of a health stressor. This type of coping showed a significant decrease from 3 weeks to 6 weeks post surgery. This finding suggests that at 6 weeks post-surgery athletes may have already dealt with the emotional aspects of the injury. Not being consumed by the emotional aspects might have facilitated functional recovery.

Unlike the affective cycle of injury model (Heil, 1993), where athletes used more determined coping as they progressed from experiencing denial through to acceptance, Udry's (1997) results showed that coping did not shift from negative emotional coping to instrumental coping. Udry's results suggested that the rehabilitating athletes used more of all types of coping during the first three weeks, and then as injury-related stress diminished, participants used less of all types of coping. Instrumental coping was the most used coping strategy across all 5 time periods.

Udry's (1997) selection of the Coping with Health and Injury Problems questionnaire by Endler and Parker (1992) was a useful choice, because fluctuations in specific coping styles could be measured over time. This instrument provided more useful information than a measure producing only a total coping score. Udry, however, did not use the five separate factors in the Social Support Inventory (Brown, Alpert, Lent, Hunt, & Brady, 1988), but rather, assessed social support as a total score. Meaningful information may have been lost as a result. Because data collection stopped before the participants were completely healed, further information on changes in coping and social support during the later phases of rehabilitation was not obtained.

Johnston and Carroll (2000) addressed this time limitation and examined the temporal effects of coping and social support over the entire period of rehabilitation.

Results revealed significant temporal differences for satisfaction with both informational and emotional social support. Satisfaction with support at the beginning of rehabilitation was significantly lower than at the middle or end of rehabilitation. Johnston and Carroll explained these results by suggesting that satisfaction at the end of rehabilitation reflected successful recovery and decreased negative affect.

The Coping Response Inventory – Adult Form (Moos, 1993) was used to measure approach and avoidance coping among 93 athletes who had an injury preventing normal function for at least 21 days. All avoidance and approach coping strategies, except seeking alternative rewards, decreased significantly as rehabilitation progressed. Rather than switching the type of coping strategy to suit the potential change in needs over the rehabilitation period, participants in the Johnston and Carroll (2000) study appeared to do less of all types of coping.

Unlike both Udry (1997) and Quinn (1996), Johnston and Carroll (2000) compared athletic and non-athletic populations. Johnston and Carroll defined their non-athletic group as sedentary people, or people involved in less than 3 hours a week of sport. These people had a mean age of 40 years ($SD$ = 12.42). The athletic sample was defined as people who participated in more than 3 hours of sport a week. The mean age was 31 years ($SD$ = 12.25). The only difference found between the two groups was that the athletic group was significantly more likely to adopt a seeking support coping style.

Having a large sample with differing injury types made it difficult to measure exactly when participants reached the points of beginning, middle, and end of rehabilitation. Full recovery for the participants took anywhere between 12 to 190

days. Johnston and Carroll (2000) acknowledged that some patients might not have seen a physiotherapist for some time after the injury onset. Significant recovery progress may have already been made before the participants were interviewed. Johnston and Carroll suggested that researchers interested in this area consider using designs with only one type of injury.

Johnson (1997b) used a longitudinal repeated-measures design to examine long-term injured athletes on a number of psychosocial variables as they progressed through rehabilitation. The psychosocial variables measured included mood, coping, social support, and personality. Johnson found that restricted social contacts were characteristic of athletes with prolonged rehabilitation. Non-returners claimed to have less contact with their athletic friends and sport teams than they did prior to their injuries. This pattern did not appear to be the case with athletes who did return to competition. Johnson also found that athletes who returned to competition were those who had a predominantly positive attitude towards rehabilitation. Positive attitude was measured through the physiotherapists' perspective and was more likely to be less accurate than if it were measured directly by the injured athletes. Interviews were used to obtain further information. During interviews athletes were asked whether they perceived the rehabilitation and injuries as a stressors or threats. Results showed that the non-returning group experienced their injuries and rehabilitation as more stressful and more threatening than did the returning group. Johnson's (1997b) study was limited by making comparisons between unequal and small sample sizes ($n_s$ = 65, 7, 5).

Bohachick, Taylor, Sereika, Reeder, and Anton (2002) and King, et al., (1998) made full use of their variables in a multifactorial design and examined the

associations between predictor and outcome variables as well as changes over time. Bohachick et al. examined the role of psychosocial resources in recovery from heart transplantation. Twenty-eight patients completed questionnaires that were administered in hospital as soon as was feasible after surgery and at a 6-month follow-up at home. Recovery was measured by psychological and functional outcomes. Functional outcome included personal functioning, and psychological outcomes reflected both positive and negative factors such as self-esteem, optimism, satisfaction with life, well being, anxiety, anger, and depression. The multiple psycho-social resources assessed included helpfulness, attachment, understanding, advice, information seeking, and sense of control. Measurement for these six variables was derived from the Coping With Serious Illness Battery (Stewart, 1983). A social network scale was considered a useful indicator of helpfulness and was computed by the number of linkages weighted by the perceived level of helpfulness. The first five variables were indicative of social support, and the last variable was indicative of personal control.

A number of the psychosocial support resources correlated with both positive and negative psychological outcomes during hospitalisation. Although both helpfulness and attachment correlated with five of the outcomes, attachment revealed the strongest positive association with the psychological outcome variables of self-esteem and depression. Understanding correlated significantly with only three outcomes. A positive association was found with self-esteem, and a negative association with anger, and depression. The strength of the relationships between these variables was stronger than the relationships between helpfulness and the same variables. Sense of control

significantly correlated with every outcome variable. Positive associations were found with self-esteem, optimism, satisfaction with life, and well being. Negative correlations were found with anxiety, anger, and depression. In many cases the strength of the relationship between the sense of control and outcome variables was stronger than that found between the social support and outcome variables.

Psychosocial resources assessed during hospitalisation were associated with recovery outcomes at 6-month post transplantation. Three psychosocial resources: helpfulness, attachment, and advice positively correlated with personal functioning. Unlike the social support variables, personal control did not correlate significantly with personal functioning. With the exception of sense of control, the coping style of attachment revealed the most number of significant associations with psychological outcomes. Positive associations were found with self-esteem, optimism, and well being. Negative correlations were found with anger and depression.

Another aim of the study was to explore potential changes in psychosocial resources and outcomes over the rehabilitation period. Over the 6-month period of recovery, patients who underwent heart transplant surgery demonstrated a decrease in the psychological outcome variable anxiety, an increase in the sense of well-being variable, and an increase in satisfaction with life. Three of the five social support measures (understanding, advice, support seeking) remained stable over time. Social network helpfulness and attachment decreased over time.

The inclusion of multiple variables enabled the comparison between a range of psychosocial resources and both functional and psychological recovery. The study was able to discriminate between the psychosocial variables that correlated most strongly

with psychological and functional recovery just after surgery and at the 6-months follow up.

King et al. (1998) explored the association between optimism, different ways of coping, social support mobilisation, and both psychological (mood, well-being) and functional (disruption of daily activities due to surgery) recovery outcomes. Assessment was conducted 1 week after surgery then again at 1, 6, and 12 months after surgery. Significant correlations with the functional outcome occurred primarily at the 1-month assessment phase. The coping variables that correlated positively with functional outcomes were negotiation (1 week), search for meaning and planned action (1 month), and avoidance (1 month and 6 months). The strongest positive relationship of all psychological and outcome variables was found at 1 month after surgery. At the 1 month assessment point, participants who showed higher avoidance levels also reported poorer functional outcome. Conversely, participants who reported lower avoidance levels demonstrated better physical functioning. The same direction of the relationship between avoidance coping and poor functional outcome was also reported at the 6-month assessment point.

The only correlations between social support mobilisation and psychological outcomes occurred at 12 months after surgery. Social support mobilisation positively correlated with negative mood and negatively with life satisfaction. King et al. (1998) explain this by suggesting that because " these correlations are within time, it may be that the direction of the relationship is such that a higher negative mood prompts one to mobilise support and take action in order to deal with the negative state, rather than the reverse" (p. 24). At no stage did social support mobilisation correlate with the

functional recovery outcome. King et al. (1998) also reported some temporal changes. In general, coping remained relatively stable, and the need for social support waned over time. Also, as one would expect, mood improved over time, and functional disturbance declined as rehabilitation progressed.

Caution is required when interpreting results by King et al. (1998) because a number of participants did not provide data at all four assessment times. Also, although initially included, the coping interview was not used again at the12-month assessment time. King et al. stated that they discontinued the coping interview because 10 participants said this procedure was no longer relevant. This action resulted in incomplete data. Although this study was based on older women recovering from orthopaedic surgery, the results provided detailed information as to the interplay of various coping styles, psychological states, and functional outcome over time.

Other health studies (e.g., Kendell, Saxby, Farrow, & Naisby, 2001; Kopp et al., 2003) measured relationships between multiple psychosocial variables and recovery, but methodological and statistical limitations clouded their results. The study by Kendell et al. violated a number of multiple regression assumptions, and the alpha coefficients for the locus of control scale used were at unacceptable levels. Nevertheless, Kendell et al. found greater levels of internality associated with earlier leg raise (measure of functional recovery) in people with short-term leg injury. They also found a significant positive relationship between catastrophising and number of days to leg bend (measure of functional recovery).

The study by Kopp et al. (2003) needs to be read with caution because the participant to variable ratio and the degree of correlation on some variables,

specifically locus of control, are suspect. Kopp et al. examined the influence of psychological, physical, and socio-demographic variables on recovery from surgery. They found that the strongest predictors of recovery came from internal locus of control, number of previous operations, and the personality dimensions of life satisfaction and attainment orientation. In comparison to the other variables, social support rated as one of the least predictive. Despite its poor relationship in comparison to the other variables' influences on recovery from surgery, social support ($R^2 = .04$) revealed a direct positive relationship with recovery from surgery.

Results by Kopp et al. (2003) did not show a significant relationship between coping and social support. Yet coping appeared to be influenced by personality dimensions and anxiety. Participants who used more coping demonstrated less anxiety than participants who used less coping. They suggested that these negative associations could be explained by recognising that emotionality is similar to Eysenck's neuroticism and that both these elements were linked to patterns of coping behaviour. Kopp et al. have suggested that the interaction between personality (emotionality, inhibition), coping, and anxiety may moderate individuals' recovery from surgery. Further exploration of the pathways that may influence recovery is warranted.

The following multivariate studies demonstrated that combinations of psychosocial variables influenced health outcome. Klemm (1994) examined the relationship between daily hassles and social support in 56 patients adjusting to primary lung cancer. The participants who reported a lower number of hassles adjusted better to their illness than those participants who reported a higher number of hassles. The findings supported Klemm's hypothesis that higher scores on daily hassles would

be associated with decreased adjustment. After entering social support into the equation, Klemm found that the combination of social support and daily hassles was most predictive of adjustment to the condition. Participants with higher levels of social support and lower levels of daily hassles adjusted more successfully to their conditions than participants with different profiles.

Ravindran et al. (1995) reported similar results with patients who were depressed or dysthymic. In their repeated-measures study, Ravindran et al. followed the progress of participants until they demonstrated improvement in their conditions. Depressive symptoms were positively associated with an increase in daily hassles, whereas a reduction in symptoms was positively associated with a modest yet significant decrease in daily hassles. Ravindran et al. also examined coping styles. They suggested that although there was a positive association between the number of hassles and depression, recovery was associated more with a change in ways of coping (from emotion to problem-focused) than in the number of hassles. It might be that the patients' changes in coping styles reflected their appraisals of daily hassles.

Von Weiss et al. (2002) examined daily hassles and social support as predictors of adjustment in 160 children with paediatric rheumatic disease. Parents and class-mates were regarded as sources of support. Daily hassles and social support associated with adjustment problems. Children with fewer daily hassles and higher social support reported fewer adjustment problems. Regardless of high or low levels of daily hassles, children with high classmate support had lower levels of depression and better adjustment to their disease than children with low classmate support. Von Weiss et al., Ravindran et al. (1995), and Klemm (1994) demonstrated that although hassles

influenced the recovery and adaptation process, coping and social support might have been more influential. These three studies were conducted with populations and health conditions that differ from athlete injuries. Further research into assessing whether injured athletes' daily hassles predict recovery or whether the athletes' coping and social support resources modify the effect of daily hassles is warranted.

Some multivariate studies (e.g., Quinn & Fallon, 2000; Kopp et al., 2003) incorporated medical, demographic, as well as psychological variables into their examination of factors influencing recovery. But none except for Jenkins et al. (1994) explicitly stated they were using a biopsychosocial model of health (Engel, 1977) as a conceptual framework. Jenkins et al. (1994) assessed 463 participants who were recovering from cardiac surgery on a number of variables thought to predict quality of life and recovery. Recovery outcome was assessed by the 39 item Symptom of Illness Questionnaire (Jenkins et al., 1990). This questionnaire measured frequency of cardiac symptoms, physical exertion, fatigue, vigour, sleep problems, and had two1-item recovery scales. The first recovery item asked if the patients' overall physical recovery had proceeded at the pace the patients expected or if their recovery was slower than they had anticipated. The second recovery item asked if the patients' overall psychological recovery had proceeded at the pace the patients expected, or if their recovery was slower than they had anticipated. Twenty of the thirty-nine predictor measures were significantly associated with the recovery outcomes.

No surgical or perioperative indicators such as intraoperative presence of arrhythmias, difficult pump weaning, hypotension, or duration of operative procedure associated with recovery. Rather, the majority of associations with recovery occurred

with the medical and psychosocial variables. Four of the six medical history variables predicted health status. These were angina level, dyspnea level, pre-operational hospitalisation, and fatigue. Fourteen of the sixteen psychological and social variables were predictive of recovery. These variables included anxiety, depression, hostility, life change, well being, vigor, self-esteem, and social support. Jenkins et al. (1994) examined the percentage of variance accounted for by these variables. Six variables were entered into the equation. These variables reflected medical, psychological, and social aspects of recovery. The six variables: shortness of breath, sleep problems, lifetime cigarette usage, pre-operative hospitalisation for cardiac treatment, anxiety, and social support, contributed independently and accounted for 21% of the variance of symptoms score. The results of their study supported the use of the biopsychosocial model as a conceptual framework in relation to recovery form health conditions.

*Recovery Summary*

Studies reviewed in this section, demonstrated a relationship between some psychosocial variables and recovery. When compared with one another, no one specific variable revealed a consistently stronger relationship to recovery. The studies reviewed also showed that time effects over the rehabilitation period occur. Multivariate studies revealed that combinations of psychosocial variables better predict recovery than univariate studies. According to Brewer et al. (2002), the same psychosocial variables that influence rate of recovery could also influence readiness to return to competition. To examine this connection, the psychosocial variables reviewed in this section are also reviewed in relation to readiness.

## Psychosocial Factors Influencing Readiness To Return To Competition

Definitions of readiness are as broad as the contexts in which readiness has been studied. The specific definition used for readiness for social relations between different religious groups (Sagiv & Schwartz, 1995), or readiness for therapeutic community treatment for drug abusers (Zule, Lam, & Wechsberg, 2003) may not be applicable to readiness to acquire a variety of motor skills (e.g., Blanksby, Parker, Bradley, & Ong, 1995), or as in the case of this study, readiness to return to competition after athletic injury.

The health literature contains definitions of readiness that most closely resemble that used in this thesis. The most similar definition comes from Cohen, Anthony, and Farkas (1997), who defined rehabilitation readiness as "the desire and capacity to work". Readiness to return to competition involves both the mental aspect of desire as well as the physical aspect of capacity. Discharge readiness has been defined as "a multifaceted, multistaged concept that provides an estimate of patients' and their family members' ability to leave an acute care faculty" or "as patients' and families' perception of being prepared or not prepared for hospital discharge" (Titler & Pettit, 1995, p. 64). This definition (multi-staged) also draws attention to the idea that there are degrees of readiness. Having the ability and being prepared continues the same interplay between psychological and physical readiness, an interplay that Fenwick (1979) has also pointed to in her article on discharge readiness: "readiness is conceived of not only in physiological phenomena but psychological as well" (p. 14).

The most common conceptualisation of readiness in recent years has been the transtheoretical model (Prochaska & DiClemente, 1983). The model has three central concepts: stages of change, self-efficacy, and decisional balance. It uses information from cognitive-behavioural and self-efficacy theories. The stages of change concept suggests that there are degrees or stages of readiness. The five stages of change are pre-contemplation, contemplation, preparation, action, and maintenance. The stages take into account intent and actual behaviour. Because self-efficacy is strongly related to the actual ability to perform a behaviour (Bandura, 1977), and because self-efficacy beliefs have been shown to predict future performance, self-efficacy is thought to be predictive of stages of readiness. Decisional balance assessments ask the participant to weigh the pro's and con's for performing the activity. Prochaska and DiClemente suggested that participants whose decisional balance falls on to the pro side more than the con side are more ready to perform the activity. Motivation and support are also features incorporated in the model. Social support may moderate the level of self-efficacy, which in turn influences motivation and readiness (Litt, Kleppinger, & Judge, 2002). Based on Prochaska and DiClemente's model, athletes with higher levels of social support, and greater self-efficacy may be expected to be more ready to return to competition. In the model's terms, they would be further up the chain of stages, and not at a pre-contemplation stage. Marcus, Eaton, Rossi, and Harlow (1994) found that participants who had high self-efficacy for exercise were more likely to express higher readiness to participate in activity. They found that 43% of the variance in stage of exercise was explained by pros, cons, and self-efficacy.

The transtheoretical model of readiness has primarily been applied to health behaviours such as weight loss, smoking cessation, or lifestyle changes (e.g., Vallis et al., 2003; Warnecke et al., 2001). The model is beginning to be used in examining psychological readiness and rehabilitation outcomes (e.g., Udry, Shelbourne, & Gray, 2003) and to examine return to work (e.g., Franche & Krause, 2002). Franche and Krause warned, "although the Readiness for Change model is solidly evidenced-based regarding health-risk behaviors, it remains a heuristic theoretical model regarding its application for return-to-work behavior" (p. 249). Given the intuitive similarity between return to work and return to sport processes, the same caution could apply to the model's application for return to sport.

Schlossberg's (1981) transition model of human adaptation has been used to examine transition readiness among non-pathological populations such as workers (e.g., Puksta, 1996), executives students (e.g., Phillips, Blustein, Jobin-Davis, & White, 2002), and athletes (e.g., Chow, 2001; Swain, 1991; Wheeler, Malone, VanVlack, & Nelson, 1996). N. K. Schlossberg (personal communication, July 31, 2004) studied cohorts returning to various activities such as adult learners returning to school, families returning to their home towns, people returning to work, and workers returning to more balanced lifestyles. The balance of psychosocial factors experienced by these groups determined their readiness to return to their previous activities or geographical locations. Studies using Schlossberg's model to examine transition in athletes have predominantly focused on athletes' exits from sport (e.g., Chow, 2001; Wheeler et al., 1996). Although no study has used Schlossberg's model to examine transition readiness in injured athletes returning to sport, Pearson and Petitpas (1990)

and Petitpas (1999) discussed the use of this model with injured athletes. A strength of the Schlossberg model is that it allows for the incorporation of the transactional model of stress and coping, as well as loss, cognitive appraisal, and self-efficacy models, all of which have been traditionally used to explain athletes' reactions to injury. Three tenants of Schlossberg's theory are: transitions are based on perceived changes in role, relationships, and assumptions; the balance of assets and liabilities of psychosocial factors determine transition readiness; and the influence of psychosocial factors may change over time.

Injury can be seen as a transition, because it may change peoples' roles, relationships, and assumptions. Some transitions may go unnoticed or are easily assimilated and handled (e.g., a change in training time for an athlete). In other instances, the changes in roles, relations, and assumptions may be perceived as so great that disorganisation and incongruence occur within the individual, and a restructuring of the persons' world may be needed. Corresponding emotional and behavioural symptoms may be anxiety, depression, and non-compliance or low rehabilitation adherence levels. The greater the appraisal of change, and the resultant influence on cognitive, emotional, and behavioural responses, the longer it may take to incorporate the transition and move on (N. K. Schlossberg, personal communication, July 31, 2003).

Schlossberg's model states that appraisal and the ability to re-organise past, present, and future incongruent assumptions caused by an event (or non-event) is moderated by the event and resources, or lack thereof, that the individuals bring to the event. She categorised the psychosocial factors that influence transition readiness into

perception of the particular transition (e.g., level of stress, participants' perceptions of rehabilitation processes), characteristics of the pre-transition and post-transition environment (e.g., social support), and characteristics of the individual (e.g., coping style, self-efficacy, locus of control). If the individuals' profiles are such that the balance of their three factors are assets, then they are more likely to be ready for the transition than if they had a balance of liabilities.

Schlossberg's model also takes into account the changing nature of personal and situational factors that influence readiness. At any time throughout rehabilitation, a change in the three factors that influence transition could influence the balance of assets and liabilities. An injured athlete who was once not ready to return to competition may, through a changed set of circumstances (e.g., increased social support, reduced hassles) become more ready. The value of this model is that by looking at the athletes' situations, their appraisal processes, and their resources, a practitioner could predict who is progressing well and is more ready to return to competition. Individual intervention strategies to increase resources can be identified by assessing the individuals' psychosocial profiles. The following is a review of health, work, and sport-related studies that have examined the relationships between psychosocial variables and readiness to return to pre-injury activities.

### *Psychosocial Factors and Readiness to Return*

Initial research focused on physical factors (persistent pain, loss of function) influencing return to work (e.g., Feuerstein et al., 1993) or competition (e.g., Clippinger, 1980, Teitz & Cook, 1985). More recently, research has examined the

association between psychosocial factors and readiness. Studies on readiness have explored patients' perceptions of their rehabilitation and readiness to return to pre-injury activities (e.g., Artinian, 1993; Cohen et al., 1997; Showalter et al., 2000). Primarily, these studies examined or discussed the readiness of patients who had brain trauma, bypass surgery, or were in need of psychiatric rehabilitation. Only Showalter et al. had a sample based on orthopaedic injuries. Despite having different characteristics than injured athletes, the studies shed light on how perceptions influence readiness.

Expectations regarding return to pre-injury functioning can influence transition readiness. People who expect to recovery faster than they actually do show signs of greater distress (Showalter et al., 2000) or lower self-esteem (Quinn, 1996). Both reactions may lead to lowered readiness levels. For example, lowered confidence may reduce individuals' beliefs that they can rehabilitate or return to competition successfully (Evans et al., 2000). Greater distress may result in more emotional re-organisation that needs a longer adjustment period.

Evans et al. (2000) identified perceptions of rehabilitation that may influence readiness through the previously mentioned pathway. During the early phase of rehabilitation, perceptions of uncertainty, frustration, and loss were evident. Perceptions reflected in the middle phase of rehabilitation included concern over financial issues and frustration with set-backs. In the late/re-entry phase, Evans et al.'s interviews with participants revealed that confidence in the injured body part, as well as the ability to meet the demands of competition were perceived as important to a successful competition return. Canelon (1995) also found that self-esteem and doubt

regarding their ability to succeed in the job, in addition to concern that working may cause a re-injury, affected workers' readiness to return.

Artininan (1993) explored spouses' perceptions of readiness for discharge after their partners' coronary artery bypass surgeries. Content analyses of questionnaires revealed four themes that related to readiness. They were coping, social support, personal resources, and knowing what to expect. "Women used behavioural strategies such as seeking information, planning, preparing, and problem solving. They also used cognitive strategies such as trust, faith, and optimism. Worrying was more often mentioned in relation to not feeling ready for discharge" (p. 84). Artinian found that the content of social support fell into the informational, emotional, and material categories. Informational support was frequently mentioned with regards to facilitating readiness. Those who were ready described feelings of being looked after or having emotional support from family or practitioners, especially nurses. Material aid in the form of bandages or medicines was also noted as assisting the spouses feeling ready for their husbands' discharge. The personal resources that influenced readiness included health, energy, time, self-confidence, and positive beliefs. Women reported feeling ready for their husbands' discharge when they felt confident of being able to perform the carers' duties. Those women who stated they were ready also had a sense of hope and optimism about the future recovery.

One limitation was the large variability in the quantity and quality of the answers. This limitation was partially due to the inability of the researcher to probe participants for more detailed answers because administration was conducted by mail. Another limitation of the study is that questionnaires were administered 6 weeks after

discharge. Although Artinian (1993) thought that retrospective analyses would reflect the spouses' overall perceptions of situations, limitations with retrospective analyses such as confabulated memory of actual feelings is of concern. Perception of stressors also may have been moderated by the outcome of the husbands' adaptation to the home environment.

*Readiness Criteria*

A number of articles have described the readiness criteria used by practitioners at clinics. (e.g., Cohen et al., 1997; Hill, 1997; Swarczinski & Graham, 1990; Titler & Pettit, 1995; Vance, 1992). With the exception of Titler and Pettit, who cited studies to support the selection of items on their readiness scale, no statistical or theoretical bases for readiness measurement has been provided. Cohen et al. stated that "readiness is a reflection of the consumers' interest in rehabilitation and their self-confidence, not their capacity to complete rehabilitation" (p. 5). According to Cohen et al. the following six dimensions are criteria for readiness for rehabilitation: patients (a) perceive a need for rehabilitation to help them pursue their life goals, (b) view change as desirable, (c) are open to establishing relationships, (d) have sufficient understanding of themselves, (e) can meaningfully interact with their environment, and (f) have significant others who encourage their participation. Cohen et al. stated that readiness for rehabilitation was not a stable characteristic. Clients' rehabilitation readiness and participation in recovery may wax and wane. Cohen et al. suggested assessing readiness levels periodically to ensure the relevant factors that influence readiness were being addressed. No hard data to demonstrate that rehabilitation readiness is a transient process were offered. Although the criteria listed by Cohen et

al. related to readiness to enter into psychiatric rehabilitation, some general relationships regarding readiness can be gleaned.

Hill's (1997) description of the readiness criteria used for vocational employment has similar dimensions to those described by Cohen et al. 1997. Hill believed that personal readiness for post-rehabilitation employment had less to do with symptoms than with a person's readiness to make a life change. Hill stated that six factors influenced readiness for vocational employment after rehabilitation. They were: (a) pace and quality of the rehabilitation program, (b) substance use and abuse, (c) quality of the mental health system, (d) financial concerns, (e) motivation, and (f) their support systems. In a discussion of case studies relating to patients' readiness to improve their health status, Vance (1992) identified seven factors that act as barriers to readiness. Lack of availability of human and financial support are two factors. The other factors are denial, anxiety, personal priorities, level of physical endurance, and secondary gains from the injury. There is some commonality in criteria for home rehabilitation readiness and discharge readiness. Discharge readiness relates to preparedness for a person to be discharged from hospital. Whereas home rehabilitation readiness involves being ready and capable to do exercises at home. Titler and Pettit (1995) stated that discharge readiness is determined by a show of competency in five areas. These are physiological stability of the patient, ability of patient and carers to maintain self-care regimes, access to health care and community resources, perceived self-efficacy to carry out self-care regime, and availability of social support. Titler and Pettit quoted studies to verify the use of each component in a readiness scale compiled by them. They considered self-efficacy important to measure because "people tend to

execute tasks that fall within their perceived range of self-efficacy but avoid tasks that exceed their self-efficacy expectations" (p. 69). A person who has a level of self-efficacy above a specific point will be more ready to look after themselves than those patients whose self-efficacy is below that point. Titler and Pettit suggested using a Likert-type scale to measure self-efficacy and assess the patient's degree of confidence in performing tasks or behaviours after discharge. Their scale ranged from 1 *(highly uncertain)* to 6 (*highly certain*). The second question asked the patients to rate on a scale from 0 (*not at all confident*) to 10 (*totally confident*) how confident they were in being able to perform a task or behaviour after discharge. A similar type of self-efficacy measure was used in this thesis. Titler and Pettit cited Artinian (1993) to validate the importance of the influence of social support on readiness. Artinian's study will be discussed later in this section.

Swarczinski and Graham (1990) used "coping" as an item on their transition readiness checklist administered to patients moving from an Intensive care unit to the rehabilitation phase. Their rationale for including the item was that they felt that once the patient recovered from the initial trauma, emotional difficulties that may impede rehabilitation progress might emerge. They suggested that staff would better manage patients' transitions if the patients' ways of coping were identified. Swarczinski and Graham stated that "this [coping] section may be used . . . for predicting rehabilitation readiness " (p. 90), but the article did not include further information of how coping could best predict readiness. A validated reliable measure of coping was not used to examine coping; instead, practitioners were expected to evaluate and write down their own interpretations of the patients' coping styles. The limitations of this practice are

obvious – accurate accounts are dependent on the practitioners' knowledge and assessment of coping styles.

Social support was the one consistent psychosocial factor cited as influencing readiness in the previous papers by Cohen et al. (1997), Hill (1997), Swarczinski and Graham (1990), Titler and Pettit (1995), and Vance (1992). Few studies, however, have directly explored the association between specific psychosocial variables such as coping, social support, daily hassles, self-efficacy, and psychological readiness to return to pre-injury functioning. It is even more rare to see these associations tested in a multifactorial design with people recovering from orthopeadic injuries.

Due to the influence of the transtheoretical model (Prochaska & DiClemente, 1983), self-efficacy and social support have been examined in relation to readiness. These studies tended to be associated with lifestyle changes such as smoking cessation, weight loss, eating disorders (e.g., Hasler, Delsignore, Milos, Buddeberg, & Schnyder, 2004), and exercise adoption (e.g., Marcus & Owen, 1992). In general, such studies supported the transtheoretical model and found that self-efficacy positively correlated with readiness (e.g., Litt et al., 2002; Marcus et al., 1994; Marcus, Rossi, Selby, Niaura, & Abrams 1992; Marcus, Selby, Niaura, & Rossi, 1992; Warnecke et al., 2001). Litt et al. found that social support may influence levels of self-efficacy, and subsequently, influence readiness. Magyar and Duda (2000) also demonstrated this pathway between social support, self-efficacy, and readiness.

Coping has also been associated with readiness. Jensen, Nielson, Romano, Hill, and Turner (2000) and Jensen, Nielson, Turner, Romano, and Hill (2003) found that patients' readiness to self manage pain was positively associated with their coping

responses. In a later study Jensen, Nielson, Turner, Romano, and Hill (2004) examined the associations between coping and readiness as a function of time. They found that greater readiness was associated with an increase in adaptive coping and a decrease in maladaptive coping behaviours throughout rehabilitation. Readiness to self-manage pain increased from pre-treatment to post-treatment. Progression through the stages of readiness (moving towards maintenance) was associated with pain reduction and improvement in function.

Vallis et al. (2003) found that psychosocial factors may mediate readiness within a diabetes population in the process of changing eating habits. Psychosocial factors measured were marital status, quality of life, social support, life events, and daily stress. Married participants were further along the readiness stages than those participants living alone. Vallis et al. also found that social support was highest at the contemplation stage and lowest at the action stage. Perhaps after participants made their decision to change their eating habits, they either did not solicit support or were perceived by others as not needing support. Daily stress levels were lowest for those in the maintenance stage and highest for those in the contemplation and pre-contemplation stage. This information suggests that injured athletes may need substantial support while contemplating returning to competition. After the decision to return is made and stress reduced, athletes may rely less on support or receive less support by others.

Udry et al. (2003) used Prochaska and DiClemente's (1983) transtheoretical framework to examine the readiness of sports participants for anterior cruciate ligament surgery. Although her study did not explore injured athletes' readiness to

return to competition, it is one of the few studies on psychological readiness and sport injury. Results showed that more pros than cons were reported among participants facing surgery. Participants also reported relatively high levels of self-efficacy. Udry et al. stated that "higher mood disturbances, more pros associated with surgery, greater use of dramatic relief, environmental re-evaluation, social liberation, helping relationships, and self-liberation were found in adolescents as opposed to adult participants." (p. 169). Similar results in relation to high efficacy and more pros could be expected in athletes who are more ready to return to participation.

Heil (1993) theorised that by reinforcing success in the early stages of rehabilitation, athletes would feel that they could manage the rehabilitation demands expected of them. This confidence may lead them to feel ready to return to competition earlier than athletes who were not exposed to success early in rehabilitation. Magyar and Duda (2000) found this to be the case. Athletes' confidence to return to competition was determined by their level of self-efficacy during rehabilitation. The higher their self-efficacy during rehabilitation, the more confident they were of a successful return to competition. Magyar and Duda also found that athletes' level of rehabilitation confidence was influenced by the social support provided in the training room, the high capabilities of the trainer, and the degree of familiarity and ease with the training environment. Social support provided to rehabilitating athletes by parents, team-mates, and trainers was also found to influence confidence to return to play successfully. Although the information that confidence breads confidence is not new or astounding, the finding supports Heil's contention. It also acts as a reminder that healthy, supportive environments early in rehabilitation are needed if athletes are going

to acquire the level of confidence and readiness desired to approach re-entry into competition.

Evans et al. (2000) also examined the influence of confidence in returning to competition after injury. They found that (a) confidence in the injured body part to meet the demands of the sport and (b) confidence in returning to the sport situation where the injury occurred, influenced readiness to return. Lack of confidence could have translated into tension on the field or a higher number of injury-related cognitions. Both these factors could have potentially influenced the likelihood of re-injury.

### *Readiness Summary*

Few studies in the health and sport literature have focused on readiness and psychosocial variables relating to recovery after injury. The studies that exist have suggested relationships between readiness and the following psychosocial variables: self-efficacy, social support, and coping. Most of the articles, however, are obliquely related to readiness, rather than using actual measures of readiness. In addition, valid and reliable measures of social support and coping were not used in many of the studies. With the exception of studies using the transtheoretical model, no research assessing the changes in readiness levels in sport injury over time was found. The temporal association between social support, coping, self-efficacy, stress, and readiness also needs to be explored using reliable and valid measures

## Literature Overview

The transition from being an injured athlete to becoming a healed and competitive athlete could be viewed as a biopsychosocial process. Characteristics of

the injury and sociodemographic factors contribute to the biological, psychological, and social/contextual factors that influence outcomes such as functional performance and readiness to return to competition (Brewer et al., 2002). This review of literature provided correlational and some prospective research evidence for the relationship between psychosocial factors and both intermediate bio-psychological outcomes (e.g., rate of recovery) and injury rehabilitation outcomes (e.g., readiness to return to pre-morbid functioning).

Support for aspects of the biopsychosocial model for athletic rehabilitation has been found across several domains. But the supporting studies have not been without limitations such as small sample sizes, inadequate measures, or cohorts who differ greatly from athletes. Few studies within the sport domain have examined the influence of multiple psychosocial factors on two rehabilitation outcomes (rate of recovery, readiness to return to competition). This thesis explored multiple psychosocial variables in relation to rate of recovery and readiness to return to competition within a sport rehabilitation environment. In doing so, it is a minor test of the relationships suggested in the Brewer et al. (2002) biopsychosocial model of sport rehabilitation.

# CHAPTER 3

# METHOD

## Participants

Participants were recruited through sports medicine clinics in Melbourne. Of the 55 participants identified as suitable, seven were not interested in participating. The number of participants who actually completed the research was 35. The largest number lost in follow up was due to the participants not completing physiotherapy ($n = 9$). Because consistent contact with the physiotherapist was important, those not attending treatment from start to finish were excluded. Data from another four patients were not used because these patients moved out of the area during treatment and did not use the same physiotherapists.

Athletes and dancers ($N = 35$) who sustained a grade 2 significant inversion ankle injury (without any significant tendentious, bony component, or isolated medial ligament sprain) during participation in competitive sport or training were selected for this study. They were recruited from the population of clients attending sports medicine clinics in metropolitan Melbourne.

Participants' ages ranged between 16 and 48 years, the average age being 28 years 3 months ($SD = 8.87$). The females ($n = 21$) and males ($n = 14$) engaged in sport or dance activity on a regular basis (a minimum of three times a week) for at least two years. The physical activities they participated in were basketball ($n = 14$), netball ($n = 8$), football ($n = 5$), dance ($n = 4$), tennis ($n = 2$), hockey ($n = 1$), and golf ($n = 1$). The participants were primarily club level athletes ($n = 25$). Recreational ($n = 1$), State ($n = 5$), and National/International level ($n = 4$) athletes and dancers were also included

in the study. Participants involved in team sports constituted 80% of the sample. The remaining 20% of participants were involved in individual sports or dance.

The grade-2 ankle sprain was the first incidence of an injury for 19 of the participants, a recurrence of the same injury for one participant, and a subsequent injury to a different site for 15 of the participants. The quickest return to full participation took 4 weeks, and the longest took 14 weeks.

## Questionnaires

### *Social Support*

The Social Support Questionnaire - 6 (SSQ6) developed by Sarason, Sarason, Shearin, and Pierce (1987) measured the dimensions of perceived availability of, and satisfaction with, social support. The instrument contains 12 questions and is the abbreviated form of the Social Support Questionnaire (SSQ; Sarason et al., 1983). The SSQ6 is divided into two sections of six questions each. The first section asks participants to list all individuals excluding themselves, who they could count on to provide social support. Examples of questions in this first section are: Who can you count on to distract you from your worries when you feel under stress? Who can you count on to console you when you are very upset? The second part of the question asks the participants to rate their satisfaction with that support. All six questions asked "how satisfied are you with this support?" The Social Support Questionnaire - 6 can be found in Appendix E (see p.178).

Two scores were computed for the SSQ6. The amount of people perceived as being supportive were summed to give a total number score (SSQ6-N). Total satisfaction scores were obtained by summing the ticked score on each of the six

ratings scales (SSS). The satisfaction scale (SSQ6-S) had ratings from 1 (*very dissatisfied*) to 6 (*very satisfied*) for the six items, for a maximum total of 36. An individual's average satisfaction score was obtained from these six items. The mean Social Support Questionnaire Number - 6 (SSQ6-N) score was obtained in the same way.

Sarason et al. (1983) demonstrated high internal consistency and stability for the original scale. In their study, using 602 undergraduate students, Sarason et al. reported alpha coefficients of .90 for the SSQ-N and .97 for the SSQ-S. Test-retest correlations for the original SSQ were conducted with the same sample over a 4-week interval. Results were .90 for SSQ-N and .83 for SSQ-S.

Construct validity for the original SSQ was demonstrated by correlating the SSQ with various personality and social measures. The questionnaires were chosen because of their connection to theoretical assumptions about social support. Good construct validity was replicated across samples (see Sarason et al., 1983).

The SSQ6 was constructed to provide practitioners with a quicker way of measuring social support (Sarason et al., 1987). The internal reliability of the SSQ6 appears to be consistent with the original SSQ, with .90 to .93 for the SSQ6-N and SSQ6-S scales respectively. Sarason et al. claimed that test-retest reliability for the SSQ6 was also "highly satisfactory from a psychometric viewpoint" (p. 500). Thus, the SSQ6 offers both high internal consistency and stability.

Because the original SSQ was found to have good construct validity, the SSQ6 was compared with the SSQ, on various personality and social measures to ascertain whether the SSQ6 could be an effective substitute for SSQ (Sarason & Shearin et al.,

1987). No significant differences were found between the two instruments on comparison measures that included Multiple Adjective Affect Check List (Zuckerman & Lubin, 1965), State Trait-Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1979), and Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). Consequently, the SSQ6 was considered a good substitute.

*Ways of Coping Checklist*

The Revised Ways of Coping Checklist (R-WCCL) developed by Vitaliano et al. (1985) measures coping styles. More specifically, the checklist measures subjective reports of how much a person used a particular coping strategy within a specific situation (Vitaliano, 1987). It does not measure how effective the person thought the strategy was.

The R-WCCL was adapted from the original 68-item Ways of Coping Checklist, devised by Folkman and Lazarus (1980). Psychometric examination of the original WCCL by Vitaliano et al. (1985) revealed several methodological problems. Their findings, in addition to concerns that the original WCCL was too long, led Vitaliano et al. to develop a revised, shorter form of the WCCL. The 42 items are grouped into five coping sub-scales that reflect problem and emotion-focused coping. Problem-focused coping (the management of the source of stress) is represented by 15 items, such as "changed something so that things would turn out all right," and "made a plan of action and followed it." Emotion-focused coping (the regulation of stressful emotions) is represented by 21 items, categorised into self-blame (3 items), wishful thinking (8 items), and avoidance (10 items). The seeking social support sub-scale (6 items) is considered relevant to both problem and emotion-focused coping.

Items are rated on a 5-point Likert Scale ranging from 0 (*not appropriate*) to 4 (*regularly used*). Subscale scores are computed for the five ways of coping, by summing the rating of items that constitute each scale. Vitaliano et al. (1985) reported good reliability for the revised WCCL. Alpha coefficients ranged from .74 to .88 for all sub-scales. Comparison between the original and revised test across three samples (i.e., psychiatric outpatients, Alzheimer's disease patients, medical students) demonstrated that the revised test produced substantially less variance than the original scale.

A strong association between R-WCCL and theoretical constructs was replicated across various samples (Vitaliano et al., 1985). Evidence that anxiety and depression would be negatively related to problem focused coping, and positively associated with emotion-focused coping, was supported when using the WCCL (Coyne, Aldwin, & Lazarus, 1981). Problem-focused coping was associated with situations perceived as changeable, and emotion-focused coping was associated with situations appraised as unchangeable (Parkes, 1984).

Vitaliano et al. (1985) assessed the criterion validity for the R-WCCL. The 1980 medical school sample was used to test criterion-related validity. The school formed a group called the Verticle Support Group (VSG) that was used by distressed students seeking assistance. Criterion validity was assessed by examining the degree to which the original versus revised coping scale related to membership in this group. Because those attending the VSG were distressed and seeking social support, it was expected that VSG members would rate higher on the Seeking Social Support scale

than non-members. A significant difference between the two groups, membership and non-membership, was found, thereby demonstrating criterion validity for the R-WCCL. The Ways of coping Checklist can be found in Appendix F (p.179).

*Daily Hassles*

The Revised Daily Hassles Scale (DHS-R; DeLongis et al., 1988) measures chronic minor life stressors. The 53-item inventory contains a broad array of daily events that include: hassles associated with family (e.g., children, parents, spouse), work (e.g., fellow workers, work load, job security), finance (e.g., enough money for education, health, necessities), health (e.g., smoking, drinking, physical appearance), current events (e.g., news, environmental and political issues), home (housework, cooking, repairs), and entertainment (e.g., free time, social commitments). The Daily Hassles Scale can be found in Appendix G (p.180).

Participants are asked to respond to items on a 4-point scale. The 4-point scale ranged from 0 (*inapplicable*) to 3 (*a great deal*). The possible maximum score for hassles is 159 points (53 items). All hassles scores circled by the respondents are summed. Although the questionnaire incorporated hassles and uplifts only the hassles items were used. Holm and Holroyd (1992) examined the structure of the DHS-R and reported that the " hierarchial factor structure comprised of seven primary and two higher order factors provides a useful framework for conceptualizing the DHS-R." (p. 465) DeLongis et al. (1988) reported correlations for the total hassles scores from one day to the next (.77) and from one month to the next month (.82). When examined over a five-month period, test-retest reliability was .72. All these scores fall into an acceptable range.

### *Perceived Confidence and Readiness*

Participants rated their efficacy expectations for coping with the demands of rehabilitation on a scale ranging from 0 to 100. They also rated their readiness to return to competition or dance on a scale ranging from 0 to 100 (See Appendix H, p. 181). The utility of this self-rated efficacy indicator, has been demonstrated in previous athlete rehabilitation research by Quinn (1996).

### *Perceptions*

Data on athletes' perceptions of recovery and return to competition after injury, were obtained via three open-ended questions. The first and second questions asked the participants to describe the positive and negative thoughts and feelings they had about their rehabilitation process. The third question asked participants to describe the most important aspect they felt influenced the healing and return to participation process. The questions were asked to obtain information that the formal measures may have missed (See Appendix H, p. 181).

### *Recovery Index*

The physiotherapists provided the researcher with their estimates of the participants' rates of recovery. They filled out a form (the Recovery Index) three times throughout the participants' rehabilitation, approximately two weeks after injury, at approximately midpoint of recovery, and when the participants were ready to return to full competition. The participants' recovery was rated as on-time = 1, slow = 2, or fast = 3 (See Appendix I, p. 182). The third rating time was used to assign participants to on-time, slow, and fast recovery groups.

## Procedure

Medical staff (physicians and physiotherapists) at sports medicine clinics were provided with information about the research. Information included aims, potential practical applications of the research, participant criteria for selection, and administration procedures. (See Appendix A, p. 174).

When doctors or physiotherapists identified suitable participants, they informed the potential participants of the research and inquired about their interest in being involved. Once positive interest was established, the doctor contacted the researcher, who then made contact with the potential participant. During the initial phone contact, the researcher provided the interested participant with more detailed information about the study. If the potential participant wanted to be part of the research, a time to meet for the administration of questionnaires by the researcher was arranged. Most questionnaire completion was done at the clinics; when this was not possible a suitable alternative was arranged.

At the first meeting with the researcher (within two weeks of injury occurrence), the purpose and procedure of the research was reiterated. An informed consent form, and consent for the researcher to obtain information from the treating physiotherapist was signed. For the 3 participants under 18 years of age, parents witnessed the signing of consent forms. In addition to the first administration of the questionnaire (Appendix E, F, G, and H), the participant was given a short form requesting demographic and background information (Appendix D, p. 177). The second administration of the questionnaire occurred mid-way during rehabilitation and

the third when the doctor/physiotherapist gave permission for athletes and dancers to return to full physical participation.

Each participant completed the questionnaire on a private face-to-face basis with the researcher. The only exceptions were three participants whose parents wished to be in the room. Parents did not verbally interact with the answering of the questions, and the participants displayed no noticeable effect as a result of their parents being in the room. Participants were not given a time limit to complete the questionnaires, but all finished them within an hour. Except for arranging meeting times and actual administration of questionnaires, no further communication occurred between the participants and researcher. No changes to the participants' rehabilitation sessions occurred as a result of this investigation.

## Data Analysis

Given the exploratory nature of this research an alpha adjustment was not made for multiple tests of significance. Variability was controlled by limiting the injury to solely grade-2 ankle sprains and also limiting the number of physiotherapists who rated the injured athletes into recovery categories of slow, on time, and fast. Physiotherapists used the same rating scale to determine membership of groups.

For analysis 3 (time) x 3 (rate of recovery group) mixed design ANOVAs were used to explore research questions 1 and 2. The measures were taken three times over the rehabilitation period, at the beginning, middle, and end of rehabilitation. Dependent variables measured included social support (satisfaction and number), coping styles (problem focused coping, wishful thinking, self-blame, seeking social support, avoidance), daily hassles, physical and psychological confidence, and physical and

psychological readiness to return to competition. To examine research question 3, the strength and direction of the association between psychological and physical readiness and all other variables were measured using Pearson's correlations.

Cohen (1990) stated that "the primary product of research is one or more measures of effect size, not *p* values" (p. 1310). The importance of going beyond inferential statistics by calculating and reporting effect sizes was supported by a number of researchers including Andersen and Stoové (1998), Speed and Andersen (2000), Udry et al. (2003), and Weiss (2003). In their article, Andersen and Stoové provided an example of a study that reported and discussed significance levels, but only reported and did not discuss effect sizes. Despite $p > .05$, the effect sizes suggested that the intervention was most likely helpful. This thesis reports and discusses both significance levels and effect sizes. Variables that had effect size values $\eta^2$ of (.06) for ANOVAs or higher were scrutinised further using univariate comparisons. Rationale for using this method can be found in the 5th edition of the *Publication Manual of the American Psychological Association* (APA, 2001). It is stated "As a general rule, multiple degree-of-freedom effect indicators tend to be less useful than effect indicators that decompose multiple degree-of-freedom tests into meaningful one degree-of-freedom effects – particularly when these are the results that inform the discussion." (p. 26).

Qualitative analyses of the three open-ended questions asked in the research were presented in table format. A content analysis of the respondents' answers was conducted, and data were sorted into categories according to similarity. Categories were then ordered in terms of most frequent responses to least frequent responses.

# CHAPTER 4

# RESULTS

Mean scores and standard deviations of the entire sample for each of the 12 variables studied over time (Time 1, 2, & 3) are presented in Table 1. Mean scores and standard deviations for 12 variables by time and rate of recovery groups: slow, on-time, and fast are reported in Table 2.

To ascertain whether differences between groups and changes over time, were significant, a series of mixed-design ANOVAs were conducted with the following dependent variables: psychological readiness, physical readiness, psychological confidence and physical confidence in rehabilitation, social support (number and satisfaction), coping skills (problem focused, avoidance, seeking social support, wishful thinking, self-blame), and daily hassles. Due to the exploratory nature of this study no Bonferroni corrections were made for multiple tests of significance, avoiding increasing the probability of Type II errors. Results are presented and discussed mainly in terms of effect sizes. Correlations between the readiness variables and all other variables are presented in Table 3 and Table 4. The responses to the three open-ended questions are presented in Tables 5, 6, and 7.

The effect size $\eta^2$ provides a measure of the amount of variance accounted for by group membership (or for repeated measures, occasion of measurement) independent of sample size. Measures of effect size were examined and presented due to the low power inherent in the research. Variables that had an $\eta^2$ value over .06 (a medium effect) were investigated further using one degree-of-freedom effect sizes

(Cohen's *d*). Support for discussing the reported effect sizes is found in the data analyses segment of the Method Chapter. Given the issues of problems in interpreting significant interaction results in mixed-design ANOVAs (see Huck & McLean, 1975), and the very large standard deviations for the coping variables of avoidance, problem-focused coping, and seeking social support, those interactions were not interpretable. Where the interactions looked meaningful was with the variables of psychological and physical confidence and readiness. These interactions will be discussed later in the thesis.

Table 1

*Means and Standard Deviations for Total Sample, Across Times 1, 2, and 3 for the Social Support, Coping Style, Daily Hassles, Confidence, and Readiness Variables.*

| | Time 1 | | Time 2 | | Time 3 | |
|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Social Support Numbers | 14.49 | 7.60 | 14.50 | 8.05 | 14.85 | 8.20 |
| Social Support Satisfaction | 30.72 | 4.56 | 30.80 | 5.95 | 31.22 | 4.16 |
| Daily Hassles | 32.29 | 14.60 | 25.29 | 11.31 | 17.51 | 11.78 |
| Wishful Thinking | 8.20 | 5.41 | 6.02 | 4.24 | 3.37 | 4.14 |
| Self-blame | 1.91 | 2.50 | 1.46 | 3.01 | 1.05 | 2.75 |
| Seeking Social Support | 11.54 | 4.01 | 11.72 | 3.94 | 10.80 | 4.50 |
| Avoidance | 5.02 | 3.30 | 3.08 | 2.78 | 1.82 | 2.74 |
| Problem-focused | 13.60 | 6.14 | 13.14 | 5.40 | 11.97 | 5.89 |
| Psychological Confidence in Rehabilitation | 70.68 | 32.72 | 83.94 | 16.78 | 94.57 | 6.79 |
| Physical Confidence in Rehabilitation | 55.29 | 33.47 | 75.14 | 20.63 | 93.68 | 7.58 |
| Psychological Readiness to Return | 69.66 | 39.68 | 78.37 | 23.45 | 93.17 | 8.40 |
| Physical Readiness to Return | 29.57 | 29.06 | 61.57 | 19.69 | 93.32 | 6.64 |

able 2

*leans and Standard Deviations for Social Support, Coping Styles, Daily Hassles, Readiness, and Confidence, by Rate of Recovery Groups at Times 1, 2, and 3.*

| | Time 1 | | | | | | Time 2 | | | | | | Time 3 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Slow ($n$ = 13) | | On Time ($n$ = 10) | | Fast ($n$ = 12) | | Slow ($n$ = 13) | | On Time ($n$ = 10) | | Fast ($n$ = 12) | | Slow ($n$ = 13) | | On Time ($n$ = 10) | | Fast ($n$ = 12) | |
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| ocial Support Numbers | 15.61 | 7.89 | 14.00 | 9.84 | 13.60 | 5.72 | 15.70 | 8.40 | 14.90 | 9.01 | 13.66 | 7.36 | 16.00 | 8.90 | 15.50 | 8.76 | 13.08 | 7.34 |
| Social Support Satisfaction | 31.00 | 3.69 | 28.90 | 6.26 | 31.90 | 3.55 | 30.07 | 8.02 | 29.70 | 5.03 | 32.50 | 3.68 | 30.46 | 4.46 | 30.90 | 4.60 | 32.33 | 3.52 |
| Daily Hassles | 34.38 | 12.10 | 30.10 | 14.25 | 31.83 | 17.96 | 27.61 | 9.00 | 27.20 | 13.14 | 21.17 | 11.72 | 20.46 | 9.82 | 17.7 | 13.45 | 14.17 | 12.39 |
| Wishful Thinking | 9.69 | 6.77 | 8.30 | 5.16 | 6.50 | 3.60 | 7.00 | 4.49 | 4.90 | 3.78 | 5.92 | 4.42 | 4.85 | 5.47 | 2.10 | 2.80 | 2.83 | 3.09 |
| Self-blame | 3.15 | 3.48 | 1.10 | 1.28 | 1.25 | 1.21 | 2.92 | 4.70 | .70 | .95 | .50 | 1.00 | 2.07 | 4.17 | .30 | .67 | .58 | 1.44 |
| Seeking Social Support | 12.07 | 4.27 | 11.60 | 3.62 | 10.91 | 4.29 | 12.15 | 3.91 | 11.00 | 4.02 | 11.83 | 4.17 | 11.30 | 4.21 | 12.00 | 5.07 | 9.25 | 4.24 |
| Avoidance | 6.07 | 3.92 | 5.60 | 2.22 | 3.41 | 2.90 | 4.23 | 3.13 | 1.90 | 1.45 | 2.83 | 2.91 | 1.92 | 3.14 | 1.30 | 2.36 | 2.16 | 2.76 |
| Problem-focused | 15.00 | 4.54 | 14.00 | 8.44 | 11.75 | 5.41 | 15.30 | 5.58 | 12.70 | 5.45 | 11.16 | 4.66 | 11.85 | 4.84 | 13.10 | 5.68 | 11.17 | 7.31 |
| Psychological Confidence Regarding Rehabilitation | 54.62 | 33.88 | 67.00 | 38.31 | 91.17 | 9.04 | 76.15 | 17.09 | 83.00 | 19.46 | 93.16 | 8.75 | 91.54 | 6.58 | 96.00 | 6.58 | 96.66 | 6.51 |
| Physical Confidence Regarding Rehabilitation | 44.23 | 29.35 | 50.00 | 37.34 | 71.66 | 30.33 | 61.92 | 21.94 | 83.00 | 13.98 | 82.92 | 17.38 | 91.53 | 6.88 | 95.00 | 6.66 | 94.91 | 8.99 |
| Psychological Readiness To Return | 69.23 | 38.17 | 55.00 | 47.67 | 82.33 | 32.35 | 68.46 | 25.11 | 84.00 | 21.57 | 84.42 | 21.13 | 92.69 | 7.25 | 91.50 | 11.80 | 95.08 | 6.34 |
| Physical Readiness To Return | 25.38 | 26.80 | 21.00 | 28.84 | 41.25 | 30.16 | 51.15 | 18.04 | 66.50 | 17.95 | 68.75 | 19.32 | 91.92 | 6.63 | 93.50 | 6.69 | 94.70 | 6.88 |

## Research Questions 1 and 2

Mixed-design 3 (time) x 3 (group) ANOVAs were used to examine whether there were differences in the variables over time, and between low, on-time, and fast recovery groups. Results for each measured variable follows.

### *Social Support*

The number of people nominated in the participants' social support networks remained stable throughout the study. Results showed no main effect for time or group, $F(2, 64) = .25, p = .78, ES = .01$; $F(2, 32) = .27, p = .76, ES = .02$, respectively. No significant interaction was found, $F(4, 64) = .42, p = .79, ES = .02$. Satisfaction with social support also remained stable over the three time periods. No main effect for time was found, $F(2, 64) = .38, p = .68, ES = .01$. Although no main effect for group was found, although a small to moderate effect size was reported, $F(2, 32), = .96, p = .40$, $ES = .05$. No interaction effect was found.

### *Coping Styles*

The coping sub-scales examined were wishful thinking, self-blame, avoidance, seeking social support, and problem-focused coping. Main effects for time revealed that coping strategy use declined over time. Although no significant group main effects were found, medium to large effect sizes on all emotion-focused coping variables suggest that differences between the way slow, on-time, and fast recovery groups used coping were present.

*Wishful thinking.* Wishful thinking means decreased over the duration of rehabilitation. A main effect for time with a very large effect size was found, $F(2, 64)$

= 18.90, $p$ = .001, $ES$ = .37. One degree-of-freedom effect sizes between time 1 and time 3, time 1 and time 2, and time 2 and time 3 revealed Cohen's $d$s of .87, .52, and .65, respectively. No between group main effect was found but the effect size was moderate, $F(2, 32) = 1.26$, $p$ = .29, $ES$ = .07. Cohen's $d$s between slow and on-time, slow and fast, and on-time and fast groups revealed values of .38, .40, and -.05, respectively. No interaction effect was found, and the effect size was small $F(4, 64) = .68$, $p$ = .60, $ES$ = .04.

*Self-blame.* A medium to large main effect for time was found, $F(2, 64) = 4.62$, $p$ = .01, $ES$ = .13. Comparisons between time 1 and time 2, time 1 and time 3, and time 2 and time 3 revealed Cohen's $d$s of .25, .46, and .36, respectively. Although no significant group main effect was found, the effect size was large, $F(2, 32) = 2.51$, $p$ = .09, $ES$ = .14. Comparisons between slow and on-time, slow and fast, and on-time and fast groups revealed Cohen's $d$s of 74, .67, and. 12, respectively. No interaction effect was found, and the effect size was small, $F(4, 64) = .51$, $p$ = .73, $ES$ = .03.

*Avoidance.* The significant large main effect for time, $F(2, 64) = 19.51$, $p$ = .001, $ES$ = .38, demonstrated that avoidance coping was used less frequently as rehabilitation progressed. Comparisons between time 1 and time 2, time 1 and time 3, and time 2 and time 3 found Cohen's $d$s of .56, .86, and .54, respectively. Despite the result of no significant main effect for group being found, a medium effect size was reported, $F(2, 32) = 1.16$, $p$ = .33, $ES$ = .07. Comparisons between slow and on-time, slow and fast, and fast and on-time groups revealed Cohen's $d$s of .52, .36, and .01

respectively. A large significant interaction effect was found, $F(4, 64) = 2.55$, $p = .05$, $ES = .13$.

*Seeking social support.* No significant main effects for time or group were found, $F(2, 64) = .82$, $p = .44$, $ES = .03$; $F(2, 32) = .37$, $p = .69$, $ES = .02$, respectively. No significant interaction effect was found, but there was a medium effect size, $F(4, 64) = 1.45$, $p = .23$, $ES = .08$.

*Problem-focused coping.* No significant main effect for time was found. Nevertheless, a moderate effect size was reported, $F(2, 64) = 2.16$, $p = .12$, $ES = .06$. Comparison between time 1 to time 2, time 1 to time 3, time 2 to time 3 revealed Cohen's *d*s of .10, .32, and .30, respectively. No significant main effect for group was found, and the effect size was small, $F(2, 32) = .86$, $p = .43$, $ES = .05$. No interaction effect was found, however a moderate effect size was reported, $F(4, 64) = 1.45$, $p = .23$, $ES = .08$.

### *Daily Hassles*

Hassles scores for the total sample decreased over the rehabilitation period. The most hassles were reported at time 1 and the least at time 3. A significant main effect for time was found, and the effect size was large, $F(2, 64) = 28.80$, $p = .001$, $ES = .47$. Comparisons between time 1 to time 2, time 1 to time 3, time 2 to time 3 revealed Cohen's *d*s of .58, 1.12, and .96, respectively. The three rate of recovery groups did not significantly differ in the number of daily hassles reported, $F(2, 32) = .68$, $p = .52$, $ES = .04$, and no significant interaction was found, $F(4, 64) = .69$, $p = .60$, $ES = .04$.

### *Psychological and Physical Confidence in Rehabilitation and Readiness to Return to Competition*

Scores on physical and psychological readiness increased as the rehabilitative phase progressed from time 1 to time 3. Effect sizes of .06 and greater were found for all comparisons made between rate of recovery groups.

#### *Psychological Confidence in Rehabilitation*

Psychological confidence increased over the three time periods. A mixed-design ANOVA revealed a significant main effect for time, $F(2, 64) = 21.50$, $p = .001$, $ES = .40$. Comparisons between time 1 and time 2, time 1 and time 3, and time 2 and time 3 revealed Cohen's *d*s of -.55, -.82, and -.85, respectively. A main effect for group was also reported, and the effect size was large, $F(2, 32) = 5.16$, $p = .01$, $ES = .24$. Comparisons between slow and on time, slow and fast, on time and fast groups revealed Cohen's *d*s of -.43, -1.49, and -.84, respectively. A significant interaction effect with a large effect size was reported, $F(4, 64) = 3.63$, $p = .01$, $ES = .19$. The relationship of rate of recovery groups to psychological confidence changed over time. Athletes belonging to the fast recovery group reported the highest level of psychological confidence throughout rehabilitation and confidence remained stable over time. The slow and on-time groups started out with low confidence levels. By the end of rehabilitation, however, they increased their confidence levels to the level of confidence reported by the fast recovery group.

*Physical Confidence in Rehabilitation.*

Physical confidence levels increased as time progressed throughout rehabilitation. A large effect size and a significant main effect for time were found, $F(2, 64) = 41.43, p = .001, ES = .56$. Comparisons between time 1 and time 2, time 1 and time 3, and time 2 and time 3 revealed Cohen's *d*s of -.78, -1.19, and -.99, respectively. The fast recovery group reported higher levels of physical confidence than the slower recovery group. A main effect for group with a large effect size was found, $F(2, 32) = 3.50, p = .04, ES = .18$. Comparisons between slow and on-time, slow and fast, and on-time and fast groups revealed Cohen's *d*s of .48, -.96, and -.42 respectively. A significant interaction effect with a large effect size was reported, $F(4, 64) = 2.54$, p = .049, $ES = .14$. A similar pattern emerged for physical confidence as was shown for psychological confidence, except that the fast recovery group started out a bit lower, but still greater than the slow and on-time group.

*Psychological Readiness to Return to Competition.*

Psychological readiness to return to competition increased as rehabilitation progressed. A significant main effect for time with a large effect size was reported, $F(2, 64) = 13.70, p = .001, ES = .30$. Comparisons between time 1 and time 2, time 1 and time 3, and time 2 and time 3 revealed Cohen's *d*s of -.32, -.65, and -.75, respectively. No group main effect was reported, but the effect size fell into the medium range, $F(2, 32) = .93, p = .40, ES = .06$. Comparisons between slow and on time, slow and fast, and on time and fast groups revealed Cohen's *d*s of -.05, -.53, and

-.49, respectively. No significant interaction was found, but a large effect size was reported, $F(4, 64) = 2.40$, $p = .06$, $ES = .13$. The interaction found was similar to the pattern identified in the psychological confidence interaction.

*Physical Readiness to Return to Competition.*

Physical readiness to return to competition increased as rehabilitation time progressed. Not surprisingly, a huge effect size and large main effect for time was found, $F(2, 64) = 118.76$, $p = .001$, $ES = .79$. Comparisons between time 1 and time 2, time 1 and time 3, and time 2 and time 3 revealed Cohen's *d*s of -1.42, -2.07, and -1.53, respectively. No significant group main effect was found, but the effect size was medium to large, $F(2, 32) = 2.31$, $p = .11$, $ES = .13$. Comparisons between slow and on time, slow and fast, and on time and fast groups revealed Cohen's *d*s of -.28, -.72, and -.48, respectively. No significant interaction effect was found, but a medium to large effect size was reported, $F(4,64) = 1.77$, $p = 1.44$, $ES = .10$. The interaction found was similar to the pattern identified in the physical confidence interaction.

## Research Question 3

To determine whether there are associations between psychological and physical readiness variables, and the social support, coping, hassles, and confidence variables, a correlation matrix of all variables at each time was calculated. See Tables 3 and 4. Presented below are the significant correlations found.

### *Psychological Readiness*

The strongest relationships between psychological readiness and other variables were found consistently with satisfaction with social support, psychological confidence with rehabilitation, and physical readiness to return to competition. Although the above

variables were significant at all three time phases measured, the wishful thinking variable was found to be significant at time 2 and time 3. The daily hassles variable was found to be significant at time 3.

### *Physical Readiness*

No variable consistently correlated with physical readiness throughout the three time phases of the study. The total number of variables correlating with physical readiness declined as the time to return to competition drew closer. Five variables correlated with physical readiness at time 1, five at time 2, and one variable at time 3. The variables are wishful thinking, daily hassles, psychological readiness, psychological confidence in rehabilitation, and physical confidence in rehabilitation.

Table 3

*Correlations between Psychological Readiness and All Other Variables at Times 1, 2, and 3 for the Whole Group.*

| | Psychological Readiness | | |
|---|---|---|---|
| | Time 1 | Time 2 | Time 3 |
| Social Support (N) | .20 | .24 | .21 |
| Social Support (S) | .42[b] | .40[a] | .42[a] |
| Problem-focused | .08 | .32 | .25 |
| Avoidance | -.29 | -.005 | .12 |
| Seeking Social Support | .04 | .18 | -.21 |
| Wishful Thinking | -.37 | -.52[c] | -.37[a] |
| Self-blame | -.03 | .09 | .18 |
| Daily Hassles | -.12 | -.20 | -.44[b] |
| Psychological Confidence/Rehabilitation | -.57[b] | .72[c] | .57[c] |
| Physical Confidence/Rehabilitation | .43 | .56[c] | .50[b] |
| Physical Readiness to Return | .49[b] | .62[c] | .50 |

a = < .05

b = < .01

c = < .001

Table 4

*Correlation Table for Physical Readiness and All Other Variables at Times 1, 2, and 3 for the Whole Group.*

| | Physical Readiness | | |
|---|---|---|---|
| | Time 1 | Time 2 | Time 3 |
| Social Support (N) | .33[a] | .33 | -.00 |
| Social Support (S) | .28 | .33 | -.08 |
| Problem-focused | .16 | .24 | -.07 |
| Avoidance | -.30 | .05 | -.50[b] |
| Seeking Social Support | -.16 | -.04 | .04 |
| Wishful Thinking | -.38[a] | -.45[b] | -.16 |
| Self-blame | -.02 | -.09 | -.05 |
| Daily Hassles | -.27 | -.44[b] | -.00 |
| Psychological Confidence/Rehabilitation | .42[b] | .56[c] | .10 |
| Physical Confidence/Rehabilitation | .59[c] | .65[c] | .23 |
| Psychological Readiness to Return | .49[b] | .62[c] | .50 |

a = < .05

b = < .01

c = < .001

## Content Analyses of Participants' Perceptions of Rehabilitation and Return to Competition.

Open-ended questions were content analysed and reported in terms of tallied frequencies and percentages. Examples of the most frequently given responses are also provided.

### *Participants' Positive Responses to Rehabilitation*

The two highest frequency tallies were for "positive belief in self" and "social support from treating practitioners." Positive belief in self constituted 31%, and social support from treating practitioners 29%, of the total positive responses. Examples of positive belief responses include: "I will get better with a little bit of work," "I am confident that I can still participate in basketball at a competitive level," "I was feeling confident that going to physiotherapist was helping me heal faster." Typical examples given by participants regarding social support from treating practitioners were: "Physiotherapist has been very supportive and understanding," "Good treatment from physiotherapist—could talk about issues regarding rehabilitation and other relevant issues," and "Consistent support from physiotherapist has helped."

### *Participants' Negative Responses to Rehabilitation*

The most frequent number of responses ($f$ = 76) related to the theme "emotional responses." "Frustration" ($f$ = 38) and "concern" ($f$ = 31) were sub-categories of the "emotional responses" theme and revealed higher frequencies than the second most common theme of "time issues" ($f$ = 26). Examples of the frustration responses included: "It's hard not playing sport and frustrating being

sidelined," "It is slow and somewhat frustrating," "It's frustrating that there may still be something wrong although I feel good," "I was frustrated that the strengthening exercises were aggravating the ankle." The theme of "concern" was divided into "concern over rehabilitation" and "concern over return to competition." Examples of concern for rehabilitation included worries over the ability to improve and meet the rehabilitation requirements, whereas concern over return included being worried about maintaining former status or the possibility of re-injury. Examples of "time issues" responses included "took longer than I first thought," "still takes time," "process of healing too slow," and "slow, hate waiting, want to play football."

*Perception of Important Factors Related to Recovery*

Participants were asked to write responses to the following question: "What were the most important factors that assisted your recovery?" The two most frequently given responses were social support and positive self-belief. These responses constituted 34% and 22% of total responses for important factors relating to recovery. Examples of social support were "support from friends and family especially in the early stages of the injury," "physiotherapist who talks to you and explains things clearly," "advice from medical staff, physiotherapist and trainer," and "physiotherapist kept me training and keeping positive." Positive belief examples included: "positive mind—if you think you can (rehabilitate and return) you will," "being positive and staying confident about the process," and "belief that no matter how slow it takes, it will eventually be okay."

Content Analyses of Participants' Perceptions of Rehabilitation and Return to Competition

Table 5

*Participants' Positive Perceptions of Their Rehabilitation Process*

| Positive Themes | *f* |
|---|---|
| Beliefs | (48) |
| Thinking positive | |
| - belief injury will heal | 31 |
| - looking forward to playing | 3 |
| Commitment to rehabilitation | |
| - attendance, compliance, | 10 |
| - being persistent/putting in effort | 4 |
| Support | (37) |
| from Treating Practitioners | |
| - information/advice re injury | 17 |
| - supportive/understanding | 3 |
| - thorough | 2 |
| - approachable | 4 |
| - ease of access | 3 |
| - confidence in physiotherapist | 2 |
| - communication between treating practitioners | 1 |
| from Family/Friends | 3 |
| from Work - Employer and Colleagues | 2 |
| Concrete/Practical Feedback | (13) |
| - see small advances | 11 |
| - return to modified activity | 2 |
| Emotional Response - Glad | (7) |
| Use of brace/cortisone | (4) |

Table 6

*Participants' Negative Perceptions of Their Rehabilitation Process.*

| Negative Themes | *f* |
|---|---|
| Emotional responses | (76) |
| Frustration | |
| - sidelined and want to play | 21 |
| - not being mobile | 5 |
| - swelling | 6 |
| - aggravation of injury during rehabilitation | 5 |
| - missed tournament | 1 |
| Concern | |
| - general concern during rehabilitation | |
| - re-injury | 9 |
| - lack of fitness/behind team mates | 2 |
| - doing too much/return too soon | 4 |
| - during rehabilitation about return to competition | |
| - not able to play at pre-injury level | 7 |
| - fitness standard dropped | 2 |
| - re-injury | 7 |
| Anger | |
| - length of rehabilitation | 3 |
| - inability to play/exercise disrupted | 1 |
| - still painful despite length of time and money spent | 1 |
| Scared | |
| - the unknown | 2 |
| Time Issues | (24) |
| - length of time to heal | 20 |
| - slow progress | 2 |
| - playing seems a long way away | 2 |
| Treatment Issues | (14) |
| Access to Physiotherapy | |
| - travel time to physiotherapist | 3 |
| - money | 5 |
| - attendance for treatment | 2 |
| Not enough Information | |
| - unsure about healing time | 1 |
| - unsure what exercises could be done | 1 |
| Client Interaction | |
| - production line therapy | 1 |
| - privacy issues - curtains | 1 |
| Lack of Support | (3) |
| - family | 1 |
| - physiotherapist | 1 |
| - team travelling away | 1 |
| Disruptions | (2) |
| - work | 1 |
| - exercise routine | 1 |

Table 7

*Participants' Perceptions of Important Factors that Contribute to Good Rehabilitation and Readiness to Return to Competition*

| Perceptions of Recovery – Themes | *f* |
|---|---|
| Social Support | (57) |
| Feedback from physiotherapist | |
| - advice regarding progress and care | 30 |
| From Significant Others | |
| - coach/manager | 5 |
| - team | 8 |
| - family and friends | 12 |
| - someone | 2 |
| Emotional/Behavioural Responses | (47) |
| Positive belief | |
| - belief in self | 8 |
| - belief that injury will heal | 20 |
| - belief in medical practitioners | 9 |
| - patience | 2 |
| - empowerment | 1 |
| - motivation | |
| - desire/need to return to an active lifestyle | 6 |
| - need to return to work (performing) | 1 |
| Self-awareness/Monitoring | (20) |
| Not over doing it | |
| - re rehabilitation | 9 |
| - re returning too soon | 2 |
| - goal setting/Measuring improvement | 7 |
| - listening to my body | 1 |
| - focus on performance /use visualisation | 1 |
| Treatment issues | (14) |
| - regular adherence to rehabilitation programme | 11 |
| - early treatment | 1 |
| - return to modified, graduated competition | 1 |
| - ease of access of treatment | 1 |
| Time | (14) |
| - not being pressured to return | 10 |
| - time to feel confident | 1 |
| - using time constructively | 3 |
| Rest/Exercise and strengthen muscles | (10) |
| Strapping/braces/physiotherapy equipment | (7) |
| Better weather | (1) |

These qualitative results will be considered along with the quantitative ones in the Discussion chapter.

# CHAPTER 5

# DISCUSSION

This study examined the associations between psychosocial factors, rate of recovery, and readiness to return to competition. In so doing, the study found that various psychological factors could account for variance in rate of recovery and readiness among injured athletes. The study also found partial support for aspects of the biopsychosocial model of athletic injury rehabilitation by Brewer et al. (2002). The model proposed that psychosocial factors (social networks, stress, personality, cognition, affect, and behaviour) played a central part in influencing the intermediate biopsychosocial outcomes (e.g., rate of recovery) and sport injury rehabilitation outcome (e.g., readiness to return). This study found associations between psychosocial variables (2nd tier of the model) and rate of recovery (3rd tier). Associations were also found between psychosocial variables (2nd tier) and readiness (4th tier). Fluctuations in levels of psychosocial variables over the rehabilitation period were found for all but the social support variables and problem-focused coping. The biopsychosocial model describes a bi-directional relationship between sport rehabilitation outcomes (e.g., readiness) and intermediate biological outcomes (e.g., rate of recovery). This study demonstrates that a relationship between the two outcome factors exists.

## Psychosocial Variables and Rate of Recovery

All variables, with the exception of social support and daily hassles, revealed a moderate or higher association with rate of recovery. The strongest associations with rate of recovery were found with the confidence variable. Athletes who reported

greater beliefs in their physical and psychological confidence to meet the requirements of rehabilitation recovered faster than athletes whose beliefs were not as high. The relationship between confidence and rate of recovery can be explained through the use of the cognitive-behavioural model. The athletes' beliefs that they could manage the challenges of rehabilitation may have placed them in positive mental states that helped reduce doubts or emotional trauma associated with rehabilitation. A high level of psychological confidence in meeting the demands of rehabilitation may have mobilised athletes to approach, rather than avoid, rehabilitation. Self-efficacy theory (Bandura, 1977, 1986) suggests that people with high levels of confidence rebound better from set backs than those with low levels of confidence. This approach behaviour, and ability to manage setbacks, may have contributed to quicker recovery. Athletes with less confidence may have doubted their ability to return to competition. Avoidance or increased stress generally connected with a negative view of rehabilitation, may have contributed to the association between low confidence and slower recovery.

Recovering quickly may have allowed the athletes to experience higher feelings of confidence. These higher feelings of confidence may have been associated with greater feelings of success, which in turn may have affected the speed of their recovery. Alternatively, the higher level of physical confidence reported by the fast recovery group may have enabled the group to be more psychologically confident in approaching the phases of rehabilitation. The athletes' beliefs that their injured ankles were able to withstand the rehabilitation tasks required may have again resulted in an approach rather than an avoidance mentality. A decisive approach is a valuable tool when working with ankle injuries, because weight bearing and wobble board exercises

may put some patients off and delay their progress. High physical confidence may also assist the athletes' recoveries by providing them with the impetus to take risks and push their injured ankles onto the next level of rehabilitation.

The following studies show that a positive association between confidence and recovery within the athletic population is emerging within the literature. Faster recovery has been positively associated with greater levels of positive self-talk (e.g., Ievleva & Orlick, 1991; Potter & Grove, 1999), greater positive estimations of the seriousness of injuries (e.g., de Heredia et al., 2004), greater general confidence, greater self-efficacy in reaching full recovery (e.g., Quinn & Fallon, 2000), and from this study, greater physical and psychological self-efficacy to meet the demands of rehabilitation. The emerging picture supports Bandura's (1977) opinion that having a strong belief in one's ability to perform a task increases the probability that the outcome will be achieved.

Participants with higher levels of physical readiness and psychological readiness, recovered faster than participants with lower levels of readiness. A number of reasons could explain this result. According to Prochaska and DiClemente (1983) people with advanced stages of readiness (action, maintenance phase) are more likely to approach and adhere to their interventions than people who exhibit less advanced stages of readiness (pre-contemplation, contemplation stage). Faster recovery by athletes high in readiness is more probable because of these approach and adherence characteristics. Schlossberg (1981) provided a further reason as to why athletes high in readiness recover faster. Transition readiness occurs more quickly when people resolve the emotional concerns associated with the transition. Given this observation, three

factors may have contributed to the combination of faster recovery and higher readiness. Athletes in the fast recovery group may not have appraised the situation as stressful, may have used more effective coping styles such as problem-focused coping, or may have quickly resolved any major concerns that hindered their transitions. This study gives support to the first two explanations.

Medium to large and large effect sizes for all three emotion-focused scales were found. With the exception of the self-blame variable (the on-time group reported a negligible .08 lower than the fast recovery group), the fast recovery group demonstrated less emotion-focused coping than the on-time and slow recovery groups. An explanation for this result is that the fast recovery group, who reported high levels of readiness and confidence, considered their injuries as situations that they could modify or manage. Consequently, they put their efforts into adhering to their rehabilitation regimes. This explanation is consistent with Folkman et al. (1991) who suggested that people with high self-efficacy have greater beliefs that they can influence their environments, and consequently, will tend to use more problem-focused strategies. Lazarus and Folkman (1984) suggested that people who have less confidence, who feel threatened, or who are under-resourced are more likely to use emotion-focused strategies. The findings show that the slow recovery group, who had the least amount of confidence, used the most amount of avoidance and wishful thinking throughout rehabilitation. This finding supports Lazarus and Folkman's contention mentioned above. The slow recovery group also reported the highest overall use of self-blame. They approached rehabilitation with more than double the amount of self-blame than the other groups. It is possible that the negative emotions associated

with higher levels of self-blame may have hindered their recoveries by interfering with a positive rehabilitation focus or by taxing the immune system.

Studies cite problem-focused coping as a strategy that enables people to be more goal-directed and to adhere more to good health behaviours that ultimately lead to quicker recoveries (e.g., Evans & Hardy 2002a; Krantz, Baum, & Wideman, 1980; Theodorakis et al., 1997). Given this information, it is somewhat surprising that problem-focused coping showed only a small to moderate effect size. Some explanations for the results follow. Rotella and Heyman (1986) have described athletes as frequent users of problem-focused coping. They suggested that athletes used problem-focused approaches to their training, rehabilitation, and competition. If athletes, in general, use problem-focused coping, then it would be difficult, if not impossible, to find large differences between the slow, on-time, and fast recovery groups. Another explanation is that little difference was found because all athletes were exposed to the same rehabilitation treatments, which were based on the use of problem-focused/active coping such as goal setting and visualisation. A further explanation for the lack of differences is possible. This study, and another sport-related study (Quinn, 1996) comparing styles of coping used by rehabilitating athletes, did not find any difference between groups who recovered at varying speeds. Yet studies (Durso-Cupal, 1996; Ievleva & Orlick, 1991; Loundagin & Fisher, 1993) based on problem-focused approaches such as visualisation or goal-setting, found that slow recoverers used less problem-focused coping strategies than fast recoverers. The disparity in findings among the athletic samples suggests that results are substantially dependent on the measures chosen. Further study is needed to clarify this area.

Return to work studies (e.g., Landes & Rod, 1992) show that the longer people are out of work, the higher their stress, and the more hassles they experience. This thesis however, did not detect a strong association between daily hassles and rate of recovery. The small to moderate association revealed that the fast recovery group reported fewer hassles than the slower groups. A number of factors could explain the lower number of hassles experienced by the fast recovery group. The fast recovery group, who recovered in 4 weeks or less, was not exposed to hassles for as long a time as the slower recovery groups, the slowest of whom took 14 weeks to recover. The duration of their physical limitations and hassles, such as cooking and getting around, was short-lived for the fast recovery group when compared to the on-time and slow groups. Due to the short duration of their recovery, the fast recovering athletes were not as exposed to the potential loss of identity or status associated with injury as were the slow recoverers. The slow group relied on others for support for a longer period, and this reliance may have been perceived as a hassle. As a result, the fast recovery group may not have experienced as much emotional trauma.

Quinn (1996) also found that daily hassles did not predict overall recovery. Yet she did find that as athletes decreased the number of hassles during the middle of rehabilitation they recovered faster. It is possible that the trends reported in this study, and by Quinn, may have been more significant had a more athlete-relevant daily hassles scale been used. The daily hassles questionnaire appeared to be more relevant to the work and general health population than to injured athletes. Developing an athletic rehabilitation hassles scale based on research such as that by Granito (2001) would be a useful contribution to the literature.

Social networks (numbers of people available to provide support) did not prove to be a powerful influence on rate of recovery. This result is not totally unexpected given the findings of two other sports-related studies. The study by Ievleva and Orlick (1991) reported low correlations between social support and rate of recovery among athletes rehabilitating from short-term injury. Quinn (1996), who examined social support among elite athletes passing through long-term rehabilitation, did not find the differences between slow and fast recovers to be significant. Nevertheless, she did point out that there was a trend for faster recoverers to report fewer numbers of people providing support. The results of this thesis concur with Quinn's findings. Although no significant difference was found, the small effect size revealed that the fast recovery group may have used fewer support people than athletes in the on-time and slow recovery groups. It could be that the athletes in the fast recovery group had a set of personality or behavioural characteristics that allowed them to be more resilient in the absence of support.

These social support findings contradict studies from the health literature that shows faster recovery to be associated with patients who have a greater number of people providing social support (e.g., Jenkins et al., 1994; Magaziner et al.,1990). Results also contradict findings in the return to work literature that suggests injured workers with higher levels of social support return to work more quickly than those with lower social support.

The differences in findings between health, work, and sport cohorts could be attributed to athletes having a similar set of personal or situational characteristics that differentiate them from the majority of the community in terms of social support. Most

athletes are exposed to a range of similar social support networks, for example, family, friends, team-mates, coaches, and treating practitioners. Further study using a non-athlete population as a control group would help clarify the issue.

No significant difference between social support satisfaction and recovery was found. Despite this finding, a small effect size, points to athletes in the fast recovery group, who had the least amount of social support, being the most satisfied with their social support. This result may have more to do with the speed of their recovery, their level of confidence, and their readiness to return, as opposed to the quality of support.

The psychosocial factors, readiness and confidence, positively associated with recovery, whereas emotion-focused coping negatively associated with recovery. These associations can be explained by existing theories such as cognitive-behavioural theory, the transactional model of stress and coping (Lazarus & Folkman, 1984), the transitional model of human adaptation (Schlossberg, 1981), and the transtheoretical model (Prochaska & DiClements, 1983). An examination of the combination of variables that were associated with recovery reveals that some combinations had stronger relationships with fast or slow recovery. This finding supports Wiese-Bjornstal's (2004) contention that there is a constellation of characteristics based upon the cognitions, emotions, and behaviours of athletes that lead to optimal or hindered recovery. Wiese-Bjornstal had inferred, and Heil (1993) had stated, that maladaptive recovery could lead to a sub-clinical adjustment syndrome. The findings in this study suggest that the fast recovery group may have cognitively appraised, or emotionally and behaviourally responded to the demands of rehabilitation in a much more favourable way than those athletes in the slow recovery group. Findings also

suggest that the characteristics of the fast recovery group may interact in a way to produce athletes who are less susceptible to adjustment syndromes.

The combination of levels of variables that associated with faster recovery include: high levels of psychological and physical confidence, high levels of psychological and physical readiness, and lower use of emotion-focused coping strategies, such as avoidance, wishful thinking, and self-blame. These variables all contribute to athletes experiencing an approach mentality and approach behaviour towards rehabilitation. The low use of avoidance as a coping style suggests that these athletes thought or felt that they could manage the demands of rehabilitation. By supplementing this coping style with a high level of self-efficacy and readiness, the members of the fast group may have approached rehabilitation with even more motivation and confidence to manage the demands placed on them. These variables (low avoidance, high confidence, high readiness) were evident from the beginning of rehabilitation, and therefore, gave the members of the fast recovery group an initial positive approach to meeting the demands of rehabilitation.

The combination of levels of variables that associated with a slow recovery was the opposite of those levels of variables that associated with fast recovery. That combination included: lower levels of confidence, lower levels of readiness, and higher levels of emotion-focused coping, especially self-blame. People with higher levels of self-blame are more likely to have negative beliefs and responses (Weise-Bjornstal, 2004). It is plausible that athletes with higher self-blame had to negotiate the emotions associated with negative beliefs. This situation may have hindered the athletes in two ways: they would have taken a longer time to re-organise their thoughts to be more

positive, and the consequences of high self-blame (intrapersonal stressor) may have negatively influenced their immune systems. Higher use of avoidance, another characteristic of the slow recovery group, is found in people with poorer immunological responses to stress (Kiecolt-Glaser et al., 2002). The slow recovery group exhibited low levels of confidence and readiness from the beginning of rehabilitation. They, therefore, may not have had the confidence to deal with a lot of the demands of rehabilitation. Bandura (1977, 1982, 1986) suggested that having high emotional arousal and low self-efficacy may foil persons' abilities to focus clearly and maintain persistence of effort. These factors explain why it took a far longer time for the slow group to increase their levels of readiness and confidence than both the on-time and fast recovery groups.

## Temporal Effects

Large effect sizes were found in all variables with the exception of the problem-focused coping and social support variables. The variable that changed the most over time was physical readiness. Other variables that changed over time were physical confidence, daily hassles, psychological confidence, avoidance, wishful thinking, psychological readiness, and self-blame. These are listed in descending order of change magnitude.

As expected, the athletes' perceptions of their physical readiness increased over time. Athletes doubled their perception of physical readiness between the initial and middle stages of rehabilitation. Witnessing their developing physical strength and receiving support from the practitioners may have contributed to participants having more positive perceptions of their physical readiness. Between the middle and the end

of rehabilitation, physical readiness continued to increase although at a slower rate. The final average rating for physical readiness was 93%. This percentage may partially explain why there are a number of re-injuries shortly after athletes are told they can return to play (they may not be fully ready to return). Future research could look into this area.

The increase in psychological readiness over time was not as dramatic as the increase in physical readiness. Nevertheless, significant changes occurred in levels of psychological readiness throughout rehabilitation. In general, athletes showed a small increase in their psychological readiness to return to competition between injury onset and midway through rehabilitation. A more distinct rise in psychological readiness to return occurred when practitioners told the athletes that they were healed and could return to sport. This readiness change is quite understandable in that athletes who doubted their fitness may have become more confident as a result of their specialists telling them that they were ready to return to competition. Yet, not all athletes dramatically increased their level of psychological readiness when told by their practitioners that they could return to participation and competition.

The athletes' confidence in their abilities to use their injured ankles increased gradually throughout rehabilitation. Athletes reported the least amount of confidence at the beginning of rehabilitation and the highest level of confidence upon return to competition. This result is not surprising because it was expected that confidence in being able to use an injured site would increase as the injury healed. There was a large variation in confidence scores during the early and middle phases of rehabilitation, with fast recoverers showing comparatively high levels of confidence from injury

onset. These results suggest that practitioners need to pay particular attention to the unique characteristics of the individuals and not to expect that all athletes have a low level of physical confidence in early and middle phases of rehabilitation.

Athletes indicated a greater level of belief in their psychological abilities to meet the demands of rehabilitation as time progressed. The lowest scores in psychological confidence were found 1 week after the injury occurred, and the highest scores occurred upon return to competition. During the initial phase of rehabilitation, athletes may not have been aware of what was required for effective recovery. This lack of knowledge and uncertainty may have contributed to the athletes' lowered psychological confidence in being able to manage the demands of rehabilitation. This explanation is consistent with the findings of Evans et al. (2000) who reported that participants conveyed feelings of uncertainty and lowered confidence in the early rehabilitation phase. It can be interpreted that the final measure of confidence was high because practitioners told athletes that they were healed and ready to return. But the gradual constant increase in confidence throughout the rehabilitation process would suggest an alternative explanation. Levels of confidence towards the end of rehabilitation increased because athletes were able to meet the demands of rehabilitation, witness physical improvements throughout the rehabilitation period, and receive positive feedback from practitioners. This explanation is consistent with Magyar and Duda (2000) who found that the training room environment was a place that could influence confidence in injured athletes.

With the exception of the confidence and readiness variables, daily hassles made the most significant change over rehabilitation time. Athletes reported

experiencing the most number of daily hassles after injury onset and the least number of hassles after they were told they could return to competition. The daily hassles variable was used as a measure of stress. It can therefore be interpreted that athletes' perceptions of stress reduced as the rehabilitation progressed. The consistent reduction in hassles suggests that injury onset, and the first few weeks of rehabilitation, were viewed as more stressful than the final transition to return to competition

Previous health studies that examined daily hassles also reported a significant reduction in daily hassles as injury or illness improved (e.g., Brosschot et al., 1994; Ravindran et al., 1995). Although the cause and effect still need to be examined, results from this and previous studies corroborate the negative association between the health symptoms and hassles (i.e., as people's health improves, a reduction in hassles is noted). Previous studies (e.g., Landes & Rod, 1992) reported that injured workers were more likely to return to work as the number of hassles experienced reduced. Athletes in this study were also more likely to return to competition when the number of hassles reduced.

In general, fewer coping strategies were used as rehabilitation time progressed. This result, combined with the data on reduction in hassles over time, suggests that as stressors reduced so too did the need to use coping strategies to manage them. The emotion-focused coping styles that decreased in use over time were avoidance, wishful thinking, and self-blame. Emotion-focused strategies decreased over time much more dramatically than did problem-focused coping. Problem-focused strategies may have been more stable over time because they were more useful throughout the entire phase of rehabilitation and re-entry into competition.

Reductions in the emotion-focused variables are understandable. The highest avoidance level was found at the onset of injury, possibly because the athletes may not have wanted to face the consequences of their injuries. Time away from training or competition, as well as the hassles of physically moving around, may have been perceived as threats to be avoided. As the injury healed and the threat reduced, the need to avoid the situation also decreased. A similar process may have occurred with wishful thinking. As the injury healed, wishing that the injury would heal was not needed. During rehabilitation athletes may have resolved the issues that contributed to the feelings of self-blame (e.g., it's my fault, if I only looked where I was going) and focused more on rehabilitation issues. Communication with others such as family, friends, coaches, or treating practitioners may have facilitated the resolution of self-blame.

These findings can be explained through the Folkman and Lazarus (1984) coping model. The model states that people are more likely to use emotion-focused coping when the feel they cannot change their environments. At the start of rehabilitation, the athletes may be in a state of emotional confusion and may not have all the informational support, or actual feedback, they need to feel that they can manage their injuries. Consequently, in the absence of perceived practical ability to change their situations, they rely on emotional coping. As the emotional disorganisation resolves itself, and structured feedback regarding their progress and other concrete rehabilitation practices are introduced, athletes may begin to perceive that they can influence their environments and may rely less on emotional coping. This inherent form of goal setting found within rehabilitation programs may also have

shifted the athletes' foci from pining over their inabilities to play, to preparing for their return to competition. The decrease in use of coping strategies over rehabilitation is consistent with the studies of Udry (1997) and Johnston and Carroll (2000) who found that as injury-related stress diminished participants used less of all types of coping.

Social support was found to be the most stable variable examined in this study. The three social support measures (seeking social support, social support number, social support satisfaction) did not fluctuate significantly over the rehabilitation period. The length of rehabilitation could have contributed to this finding. The recovery time for an ankle injury is relatively short-term. In this study, the fastest person to recover took 4 weeks, and the slowest needed 14 weeks. Social support literature suggests that during the initial stages of illness or injury, social support is mobilised and may decrease as rehabilitation progresses (Jacobson, 1986). It is possible that the injury healed before the normal waning of social support occurred. Alternatively, social support structures may not change meaningfully within the short rehabilitation time unless injured athletes were with travelling professional teams and were sent home to convalesce. The demographics of participants in this study would support this idea. Most of the participants were club-level athletes who did not participate in country or interstate travel on a consistent basis. It appears that home support structures (e.g., family, friends) were stable, at least over this short rehabilitation period.

Although the short length of rehabilitation time could be an explanation for the stable support structures, similar findings by Quinn (1996) and Udry (1997), who examined social support satisfaction with long-term injured athletes, weaken this contention. They suggested that athletes have unique social structures that remain

stable throughout the course of injury. If this situation is the case, then the findings of this study would add to the literature by suggesting that short-term injured athletes also have stable social support structures. Caution, however, is needed because in this study, as well as in both Udry's and Quinn's, social support was not measured according to type (e.g., informational, emotional, practical) but rather as a total score. Johnston and Carroll (2000) found that when social support is assessed by type, changes in social support over time can be identified.

Several interactions between the independent variables of group (between participants) and time of measurement (within participants) were also found. Problem-focused coping, avoidance, seeking social support, psychological readiness, physical readiness, psychological confidence, and physical confidence all revealed moderate or large interaction effects. Such interactions in mixed design ANOVAs, however, are often difficult to interpret (see Huck & McLean, 1975).

Nevertheless, the picture that has emerged from these interactions suggests that from the beginning of rehabilitation, athletes in the fast recovery group had appraisals and behaviours that associated with quick recovery. In comparison to the on-time and slow recovery groups, athletes in the fast recovery group used less avoidance and problem-focused coping one week after their injury. They also reported higher levels of readiness and confidence. These initial positive appraisals and behaviours not only set them up for a smoother transition, but the effects of these positive approaches continued until the end of rehabilitation.

By the middle of rehabilitation, athletes in the on-time recovery group decreased their use of avoidance and problem solving and increased the level of

psychological readiness, physical readiness, and physical confidence to the levels achieved by the fast recovery group. This result suggests that the on-time group was able to surmount the initial negative reactions to the injuries and manage the demands of rehabilitation. The slow recovery group did not appear to have such positive or helpful characteristics. Not only did the slow group take a longer time to recover than the on-time and fast recovery groups (by definition), but when compared against rehabilitation assessment points such as middle and end, the slow group took a longer time to increase their levels of confidence and readiness, and to reduce the need for coping.

## Psychosocial Variables and Readiness

In examining correlations between the dependent variables for the whole sample, regardless of group membership, associations between the readiness variables and the following psychosocial variables were found: social support satisfaction, psychological confidence in rehabilitation, wishful thinking, and daily hassles. The strongest and most consistent relationships occurred between social support satisfaction, psychological confidence, physical readiness, and psychological readiness. In each case these variables correlated positively at the beginning of rehabilitation, the middle of rehabilitation, and when medical staff told athletes they could return to competition.

The positive association between confidence, social support satisfaction, and psychological readiness is not surprising. The transtheoretical (Prochaska & DiClemente, 1983) and transitional (Schlossberg, 1981) models suggest confidence and social support are variables that influence readiness. Both models purport that (a)

readiness is influenced by individuals' beliefs that they can manage the demands of the situations and (b) social support could influence the level of self-efficacy. Social support has been found to lower anxiety (Green & Weinberg, 2001) and to increase self-efficacy (Magyar & Duda, 2000). Satisfaction with the social support may positively influence injured athletes' adaptations to the stresses of rehabilitation and increase the prospects of return. Rather than spending time and energy building up larger support networks, it may be more beneficial for coaches, medical practitioners, and athletes to focus on ensuring that injured athletes are satisfied with their support.

The readiness findings contribute to the sport specific research by providing statistical support to propositions made by researchers such as Heil (1993), Evans et al. (2000), and Magyar and Duda (2000). Psychological confidence in managing the demands of rehabilitation correlated with physical readiness during the early and middle stages of rehabilitation and with psychological readiness throughout rehabilitation. This finding supports Heil's contention that confidence early in rehabilitation will lead athletes to feel that they can manage the rehabilitation demands and feel more ready to return to competition than those with less confidence in rehabilitation.

Significant positive correlations between the athletes' beliefs that their ankles will meet the demands of rehabilitation and psychological readiness to return were found during the middle of rehabilitation and when athletes were told they could return to competition. These results fit in with Magyar and Duda's (2000) contention that as injured athletes see improvements, they become more confident and more ready to return to competition. The results also support Evans et al. (2000) who stated that

"gaining confidence in the injured body part to meet the demands of sport...[is an] important aspect of re-entry" (p. 202).

Positive correlations between the athletes' beliefs that their ankles will meet the demands of rehabilitation and being physically ready to return to competition, occurred during the beginning and middle stages of rehabilitation.This correlation trend did not extend to the last phase of rehabilitation, when the athletes were told they could return to competition. It is plausible that after the structure of rehabilitation, the relatively unknown demands of competition on newly rehabilitated ankles may have resulted in worries about the possibility of re-injury. This uncertainty may have resulted in reductions in confidence or readiness. This finding suggests that when athletes are told they can return to competition some factors other than confidence in the injured ankle functioning may influence physical readiness.

Out of all the coping variables examined only wishful thinking revealed significant associations with psychological and physical readiness. Physical readiness negatively correlated with wishful thinking during the beginning and middle points of rehabilitation. During this time, athletes who used more wishful thinking were less physically ready to return to competition. Psychological readiness to return to competition significantly and negatively correlated with wishful thinking during the middle of rehabilitation, and when athletes were told they could return to competition. As was previously mentioned in the section on rate of recovery, wishful thinking is an emotion-focused coping technique that is frequently used when people feel that they cannot change their environments. When people feel more in control they are less likely to use wishful thinking. As rehabilitation progressed, and their injuries

improved, athletes in this study who reported feeling more ready did not rely on wishful thinking as a coping style.

Not surprisingly, daily hassles significantly negatively associated with psychological readiness to return to competition, when practitioners told the athletes that they could return to sport. The direction of the association between daily hassles and readiness further adds to the proposition that the athletes' perceptions of lower hassles are associated with psychological readiness to return to competition. Although other factors could have influenced this relationship, it is plausible to extrapolate that while athletes are still dealing with hassles of the transition, they are less likely to be psychologically ready to compete.

A significant negative correlation between hassles and physical readiness was found during the middle phase of rehabilitation. During the middle phase athletes may have experienced fewer hassles than at the beginning of rehabilitation because they were more mobile. Athletes, who are more mobile, may feel more physically ready to return to competition because they have already witnessed improvement. Although this negative trend continued, no significant association was found at time 3.

## Content Analyses

Content analyses provided information on athletes' positive and negative responses to their rehabilitation experiences. Also provided were their responses to the question: What were the most important factors associated with good rehabilitation and readiness to return? Because interview follow up to open-ended questions was not conducted, the data are limited. Consequently, themes obtained through content analyses are used primarily to support the quantitative data in this study, or to suggest

other factors missed by the quantitative information. In general, the qualitative data support the quantitative findings that daily hassles, social support, self-efficacy, and coping were associated with rehabilitation and readiness to return.

The athletes' negative responses to rehabilitation reflect the stressors or emotions stemming from hassles experienced during rehabilitation. The emotional responses included frustration, anger, and being scared. These results reflect much of the literature on emotional responses to sport rehabilitation. For example, de Heredia et al. (2004); Grove, Stewart, and Gordon, (1990); McDonald and Hardy (1990); Morrey et al. (1999); Smith et al. (1990); and Weiss and Troxel (1986) demonstrated that anger and frustration occurred throughout rehabilitation. Issues regarding the length of time taken for healing to occur were also noted. Given the cohort in this thesis, it is not surprising that athletes were frustrated with the length of time taken to recover and return to competition. For some athletes in training, just 1 week away from training can seem to be an extremely long time. Emotional responses also related to concern during rehabilitation and concern about returning to competition. For example, in this study, athletes were concerned about being sidelined, being less fit, and being behind their team-mates, if and when, they returned to play.

Other negative perceptions of rehabilitation revolved around treatment issues. These responses included concerns about access to physiotherapy, not receiving enough information, and clinic management. These treatment issues do not appear to be the specific concerns of athletes, but rather issues that could apply to any cohort in rehabilitation. The emotional responses that the athletes reported support the notion that rehabilitation stressors may exert negative influences. If these stressors, and

corresponding emotional responses, are severe enough they may, as Brosschot et al. (1994) and Kiecolt-Glaser et al. (2002) suggested, affect the immune system and influence the quality or speed of recovery.

Some of the responses (e.g., concerns over treatment issues and time) identified through the open-ended questions were not captured in the hassles questionnaire. This omission of relevant hassles associated with athletes recovering from injury, suggests that the daily hassles questionnaire may not have been comprehensive enough to provide clear pictures of athlete concerns. Quantitative results may have missed and under-reported the number of hassles experienced by the athletes.

Social support was a key theme mentioned in all three of the open-ended questions. Social support was mentioned as important to readiness to return to competition and as a positive aspect of rehabilitation. Lack of social support was mentioned as a negative aspect of rehabilitation. The qualitative responses associated with social support corroborate the disaggragate model of social support (Weiss, 1974). This model states that types of social support facilitate coping to the extent that the support received is appropriately matched to the support needed by the individual. A number of researchers (Bianco, 2001; Hardy & Crace, 1993; Johnston & Carroll, 1998b; Pines, Aronson, & Kafry, 1981; Robbins & Rosenfeld, 2001) have suggested that athletes require anywhere between four to eight distinguishable types of social support and that these specific types of support should be administered by particular people who can best meet the needs of the athletes. Responses in this study revealed that athletes derived support from a variety of people: physiotherapists, family, friends,

coaches, team-mates, and work colleagues. The descriptions of support obtained can be categorised broadly as informational, practical, and emotional support.

Although the quantitative data suggest that social support numbers do not influence rate of recovery and that only social support satisfaction is associated with readiness, the qualitative data suggest otherwise. Responses demonstrate that athletes value social support in relation to both rehabilitation and readiness to return to sport. Further research is needed to explore whether social support makes athletes feel better supported and influences rate of recovery, or whether social support does not influence rate of recovery, but influences the quality of the recovery experience.

Maintaining positive beliefs were reported as important to rehabilitation success and to readiness to return to competition. Responses included believing in oneself, believing that the injury will heal, and trusting medical practitioners. Athletes who had these beliefs made active attempts to reduce the threat associated with injury by either believing that they had what it took to meet the demands of rehabilitation, or believing that the medical staff had the knowledge to help them meet the demands of rehabilitation. These beliefs are reflective of both internal and external locus of control. People with internal health locus of control are more likely to take responsibility for their rehabilitation programs (Bundek, Marks, & Richardson, 1993). Those with a powerful others locus of control orientation base their trust in the medical practitioners and through this trust gain more confidence in their abilities to meet the situational demands (Madden, 1995). Ievleva and Orlick (1991) also found that athletes regarded positive beliefs to be helpful to rehabilitation. Ievleva and Orlick explored their quantitative data more closely than was done in this study. They found that athletes

who recovered faster were more likely to give positive belief responses that had an internal focus than were those who recovered more slowly. The qualitative data in this study showed a similar trend, but because interview follow-up was not conducted, in-depth discussion of these results is not warranted. Further exploration of the positive rehabilitation beliefs held by people who recover at different rates is needed.

Themes considered important to rehabilitation and readiness to return included obtaining informational and emotional support from a variety of people, thinking positively, and using mental techniques to monitor and assist the rehabilitation progress. Other themes included treatment issues such as regular adherence to rehabilitation and return to modified participation and competition. All these themes describe an active coping style orientation. The importance that athletes in this study placed on active coping throughout rehabilitation may be a reason as to why problem-focused coping did not reduce as significantly as did emotion-focused coping over time.

## Implications for Sports Medicine Practices/Practitioners

This study has shown the importance of psychological factors in recovery from short-term injuries. Physiotherapists and medical practitioners could use this knowledge to help hasten the recovery process and enhance the quality of rehabilitation. The strong positive associations between confidence, rate of recovery, and readiness suggest that it would be beneficial if practitioners set up rehabilitation programs that encourage confidence in meeting the demands of rehabilitation. Athletes reported getting feedback, receiving good monitoring, and seeing small advances in

rehabilitation as factors that contributed the most to recovery and readiness to return. It would be beneficial to athletes if practitioners continue to use good monitoring and ensure that successes in rehabilitation programs are perceived by the athletes to be obtainable. Practitioners could also ensure that a high level of feedback is provided throughout the rehabilitation and return process. To further increase levels of confidence, practitioners could encourage positive self-talk among patients.

The average percentage of confidence and readiness reported by athletes when told they could return to competition was 94% and 93%, respectively. In some athletes, not being 100% confident in having met the demands of rehabilitation, or not being 100% ready to return, may translate into doubts or worries about re-injury. These cognitions, and the corresponding hesitant behaviours, may result in re-injury when participating in competitive sport. Coaches and trainers need to ensure that they do not pressure athletes to return to competition when the athletes are not confident to do so. This comment beckons exploration into what is a safe level of confidence to allow athletes to return to play. Exploring athletes' concerns and introducing graduated re-entry programs may be useful interventions for athletes who doubt their re-entry abilities.

The primary concerns disclosed by athletes in this study are about improvement and resumption of competition. Athletes mentioned that these concerns resulted in emotional responses such as frustration and anger. Because sport psychologists can help athletes come to terms with their emotional responses to injury, it would be beneficial for staff at sports medicine centres to use such resources on a consistent basis. It would also be helpful if medical staff did not dismiss emotional or cognitive

concerns but showed empathy or provided some useful practical advice in how to best manage the rehabilitation and return to competition process. Sport psychologists could run workshops to help practitioners become more aware of these concerns and how to deal with them.

## Limitations of Study

### *Design*

Many participants did not attend the full course of physiotherapy treatment, and as a consequence the sample size was reduced significantly. The main reason provided for drop-out by athletes was that their ankles felt better, and they did not think further treatment was required. Examining the psychosocial characteristics of these participants would have been potentially useful because a profile of participants who were at risk for rehabilitation drop out may have emerged. But because I did not retain the relevant participants' questionnaires such profiling was not conducted.

Organising time to administer each questionnaire personally at the three designated data collection times was laborious. My own full-time consulting work and the participants' own time commitments made it difficult. In most cases, administering the questionnaires at the designated times (early, middle, end of rehabilitation) was achieved. In the few cases that timing was off, data collection would have been no more than 4 days late. Future research may obviate the problem of timing data collection by training assistant researchers to administer the questionnaires, or by sending the questionnaires by mail. The limitations of sending the questionnaires by mail, however, are no control over when athletes actually get around to answering, and

participants' queries would not be answered directly, leading to loss of data due to questions not being answered or answered incorrectly.

No nonathlete control group was used to compare to the responses of injured athletes. It would be interesting to note whether the responses obtained from athletes were unique to that cohort or whether they reflected the responses of the general population. A comparison between a return to work and return to sport sample could make interesting future research.

Measures of confidence and readiness were based on 0 - 100% 1-item scales. More rigorous measures of confidence and readiness would provide more detailed information about the way that these two factors relate to each other and to the other variables measured. Future researchers could consider using Prochaska and DiClements's (1983) stages of readiness scale. Another limitation is that confidence and readiness could have been measuring similar constructs. This may have resulted in finding spuriously high correlations. More sensitive measures of the two variables need to be used in future studies.

### *Questionnaires*

Both the length and relevance of questionnaires contributed to the limitations of this study. On each administration occasion, participants took approximately 60 to 90 minutes to fill out the questionnaires. Although the first administration session was met with interest, enthusiasm waned on subsequent meetings. This situation was most obviously reflected when participants filled out the social support questionnaire

(SSQ-6 Sarason & Sarason et al., 1987). A number of participants' exclaimed "Oh it's the same people who gave support. Who did I write in last time?" This attitude may have biased their response choices. Participants appeared eager to provide information about their own experiences in a format with which they were comfortable. They appeared to be more enthusiastic when completing the open-ended questions. This enthusiasm could have been because they could express their own ideas or because they felt that their rehabilitation experiences were being heard or validated.

Questionnaire relevance was of concern with two of the questionnaires: social support and daily hassles. Qualitative data revealed that athletes received and valued different types of social support from a variety of people. Because the social support questionnaire that was used measured only numbers and satisfaction with support, the influence of types of support on rate of recovery and readiness were not measured. For future research to gain practical value, questionnaires that measure type, number, and satisfaction with support, or a combination of questionnaires and interviews, could be used. Combining social support measures based on the supply model, as well as the transactional approach, would be a strength because various distinct, yet complementary approaches to the assessment of social support would be used.

The Daily Hassles Scale-Revised (DeLongis et al., 1988) was chosen because it was the most suitable scale available at the commencement of this study. Yet, the general nature of the daily hassles questionnaire did not take into account specific hassles associated with sport rehabilitation. Participants considered some items, for example, political issues and news events, irrelevant to their situations. Also, items associated with work were not relevant to school-aged participants.

### *Statistical Considerations*

Due to small sample size (i.e., *n*s of 10, 12, 13 in each group), the power of the study was low. I attempted to gain a sample size of 70 to achieve a power of .80, but this was unrealisable. Effect sizes were therefore used to interpret the results. Bivariate correlations were used to measure the associations between readiness and a number of dependent variables. These types of correlations do not take into consideration other variables. Partial correlations may have been better statistics to use as they control for the influences of the other variables. Multiple regression would have been the preferred statistic, but the low participant numbers and other design aspects prevented its use.

## Strengths

This exploratory study contributes to the body of athletic injury research by examining the relationships between various psychosocial variables, rate of recovery, and readiness to return to competition among short-term injured athletes. In so doing, it (a) provides evidence to support aspects of the biopsychosocial model of athletic rehabilitation, (b) lends support to Wiese-Bjornstal's (2004) concept of multiple psychosocial variables combining in ways to produce either slow or fast recoveries, and (c) corroborates narrative articles written by sport psychologists regarding injury and the return to competition process (e.g. Petitpas & Danish, 1995). The study also contributes in a practical sense. Sports medicine practitioners interested in returning their patients to competition as quickly as is prudent, can use the practical findings in this study to develop an attentive and supportive rehabilitation approach.

In keeping with a more holistic view of athletic rehabilitation, this study has taken into account both the physical and psychosocial aspects of recovery. In so doing,

it has shown that the physical and psychological aspects influence one another and that both aspects need to be addressed in a rehabilitation program. Practitioners may be able to use this information to develop supportive programs that span the entire transition from being recently injured to complete return to practice and competition.

The prospective nature of this study takes into account the relevant changes over time as they happened. Thus, the likelihood of loss of data and inaccurate accounts due to memory problems was reduced. The small number of physiotherapists used in this research enabled a relatively consistent approach to treatment and assessment of recovery.

The design of the study, particularly the choice of using one injury type, assisted in managing at least two limitations. First, by using the same injury type and selecting athletes who relied on their ankles for their sports, this study ensured that the injury would have similar relevance to the playing ability of all athletes studied. Different injuries have varying influences on the patients' return to function. A track athlete with a broken finger may not experience as great an impediment as an archer or shooter with a finger injury. Second, different methods of treatment and management would also be needed if various injuries were used. Therefore, by using one injury (i.e., grade-2 ankle sprain) that had the same impact on the athlete and required a similar treatment protocol, relative uniformity of treatment was ensured.

## Future Studies

In addition to addressing the issues mentioned in the limitations section above, future studies could explore whether the same variables have an influence on rate of recovery and readiness in long-term injuries. Will confidence be the main

psychological factor determining rate of recovery and readiness, or will some other factor, such as social support, become more important? After a longer period of time away from sport competition, are athletes going to experience the same level of readiness to re-enter sport competition, or will they be more or less hesitant to return?

In the future, researchers could use more in-depth qualitative interviewing. For example, researchers could compare rehabilitation stories given by fast and slow recoverers. They could also explore how these stories may change over time. Researchers could, through interview processes, identify examples of the active coping skills used by participants throughout rehabilitation and on return. A comparison between coping styles used by fast and slow recovery groups may provide an indication of the coping styles most suited to the athletic rehabilitation process. A similar process could be applied to understanding the cognitions that may facilitate better recovery.

## Conclusion

The present study found that the psychosocial variables of emotion-focused coping and daily hassles negatively associated with recovery rates. Positive associations between confidence, readiness, and athletes' recovery rates were also found. The strongest relationship is between confidence and rate of recovery. Positive associations between confidence, social support satisfaction, and readiness were found. Negative associations with readiness were found for the wishful thinking and daily hassles variables. The associations between multiple psychosocial variables, rate of recovery, and readiness point to the need to examine athletic rehabilitation through models of injury that take a multivariate approach. The study also demonstrated

changes in psychosocial variables over time. These changes suggest that any model explaining athletic rehabilitation needs to incorporate dynamic, interactive and temporal elements.

The findings show that psychosocial variables may contribute to the variance in recovery rates and readiness to return to competition. This information, combined with the previous literature on the influence of physical variables, gives strength to the biopsychosocial approach to athletic rehabilitation. The sports medicine team needs to take into consideration both psychosocial and physical factors when devising rehabilitation programs for injured athletes.

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# APPENDIX A

## Letters to Medical Staff

### Doctors

### Physiotherapists

**SPORTS MEDICINE CENTRES of VICTORIA**
A.C.N. 005 655 176

*Principals:*

Dr. Peter J. Fuller, M.B.B.S., F.A.S.M.F., F.A.C.S.P.
Dr. Trefor James, M.B.B.S., F.A.S.M.F., F.A.C.S.P.
Dr. Peter Larkins, M.B.B.S., B.Med.Sc.(Hons.), F.A.S.M.F., F.A.C.S.P.
Dr. Barry Oakes, M.B.B.S., M.D., F.A.S.M.F.
Dr. Nicholas Van Wetering, M.B.B.S., F.A.C.S.P.
Dr. Gary Zimmerman, M.B.B.S., F.A.S.M.F., F.A.C.S.P.
*General Manager:*
Mr. Michael A. R. Kenihan

Mr. Michael A. R. Kenihan, Dip.Tech.Phys., Physiotherapist, F.A.S.M.F.
Mr. Steven M. Sandor, B.App.Sci.(Phty.), Physiotherapist
Mr. Terry Boyd, B.App.Sci.(Phty.), Physiotherapist
Ms. Lyn Watson, B.App.Sci.(Phty.), Grad.Dip.Manip.Ther.
Mr. Matthew Appleton, B.App.Sci.(Pod.), Podiatrist, F.A.A.P.S.M.
Mr. Gerard Healy, B.Ed.(Phys.Ed.), B.App.Sci.(Phty.), Physiotherapist
*Westgate Director:*
Ms. Ali Vasey, B.App.Sci.(Phty.), Grad.Dip.Manip.Ther.

Dear .....

I have decided to take the discussions we have had on the possible influence of psychosocial factors on rate of recovery and readiness to return to competition a step further and formally investigate whether there is any relationship.

The current study explores the associations between five psychosocial factors, rate of rehabilitation progress, and readiness to return to full athletic participation after injury. The psychosocial variables examined are: social support, coping strategies, locus of control, daily hassles, and patient satisfaction. The study, a repeated measures design, tracks the participants' responses to various questions on coping, social support etc. throughout rehabilitation. The treating physiotherapists will give the participants a recovery rating at three points throughout rehabilitation: as soon as possible after their initial consultation, mid-way during rehabilitation, and when consent to return to full participation is given. Physiotherapist ratings will be used as an index for fast, on-time, and slow recovery. The responses of participants' in the fast recovery group will be examined in relation to responses give by the slow and on-time group. Differences observed between groups may provide an indication of the way psychosocial factors influence rate of recovery. The same psychosocial variables used in exploring rate of recovery will be used to examine participants' readiness to return to sport. It is anticipated that the results of this study may assist rehabilitation providers with practical information regarding psychological predictors of speedier recovery and predictors of readiness to return to full participation.

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Your assistance in identifying suitable participants is integral to the success of the study and would be appreciated.

Participant Criteria

A total of 70 participants drawn from a pool of injured athletes and dancers are needed. The criteria for participation are:

- Grade 2 significant inversion injury, medial ligamentous or capsular lesion, inferior tibular/fibular or syndesmosis injury, without a significant tendonitis or bony component, or isolated medial (deltoid) ligament sprain.
- Participating in physical activity on a regular basis (a minimum of the three times a week) for at least two years.
- Between the ages of 16 and 35.

Participant involvement.

The participant will be asked to fill out a questionnaire three times during their rehabilitation: as soon as possible after their initial consultation, mid-way during rehabilitation, and when the treating practitioner has given consent to return to full participation. The initial questionnaire will take approximately 25-30 minutes. Subsequent questionnaires will take approximately 10 minutes.

Doctor's involvement.

Identify suitable participants. Once you have identified suitable participants, using the criteria above, please inform them of the study and suggest that they contact me or at least provide permission for me to contact them. I can be notified of potential participants

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*Westgate Director:*
Ms. Ali Vasey, B.App.Sci.(Phty.), Grad.Dip.Manip.Ther.

in any of the following ways: calling me on 01405561, leaving a message in my pigeon hole, or telling the reception staff so that they can fill in the patients name on the sheet provided. Reception staff are already aware of the study. I will contact reception at all the sports medicine centre clinics every two days. You will be provided with an information handout to give to the potential participant. Mentioning your endorsement of the study to suitable participants would greatly encouraged them to volunteer. For this I would be grateful.

Thank you in anticipation of your cooperation. If you were interested in further information about the study please do not hesitate to contact me on 01405561 or leave a message at either Prahran or Malvern sports medicine centre.

Kind regards,

Paulette Mifsud

Psychologist MAPS

# SPORTS MEDICINE CENTRES OF VICTORIA

A.C.N. 005 655 176

**Malvern Sports Medicine Centre**
330 High Street, Ashwood, 3147
Phone 885 8961
Fax 885 8668

**Croydon Sports Medicine Centre**
383 Dorset Road, Croydon, 3136
Phone 725 2444
Fax 725 1959

**Prahran Sports Medicine Centre**
316 Malvern Road, Prahran, 3181
Phone 529 8899
Fax 529 4248


Dear, .....

As you are aware I am conducting a study investigating the relationship between five psychosocial factors, rate of rehabilitation progress, and readiness to return to full athletic participation after injury. The psychosocial variables explored are: social support, coping strategies, locus of control, daily hassles, and patient satisfaction. The idea for the study originated from conversations between physiotherapists, medical practitioners, and myself regarding the influence of psychological factors on the rehabilitation of athletes. It is anticipated that the results of this study may assist rehabilitation providers with practical information regarding psychological predictors of speedier recovery and predictors of readiness to return to full participation.

Your assistance in identifying suitable participants and then completing a form indicating the participants' rate of recovery is integral to the success of the study and would be appreciated. A total of 70 participants drawn from a pool of injured athletes and dancers are needed. The criteria for participation are:

- Grade 2 significant inversion injury, medial ligamentous or capsular lesion, inferior tibular/fibular or syndesmosis injury, without a significant tendonitis or bony component, or isolated medial (deltoid) ligament sprain.
- Participating in physical activity on a regular basis (a minimum of the three times a week) for at least two years.
- Between the ages of 16 and 35.

Participant involvement.
The participant will be asked to fill out a questionnaire three times during their rehabilitation: as soon as possible after their initial consultation, mid-way during rehabilitation, and when the treating practitioner has given consent to return to full participation. The initial questionnaire will take approximately 25-30 minutes. Subsequent questionnaires will take approximately 10 minutes. There will be no interference with physical rehabilitation, as questionnaires will be filled out at a different time and possibly different location.

Physiotherapist involvement.
Identify suitable participants. Once you have identified suitable participants, using the criteria above, please inform them up of the study and suggest that they contact me or at least provide permission for me to contact them. You can notify me of the potential participants by calling me on 014025561, leaving the message in my pigeon hole, or

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**Prahran Sports Medicine Centre**
316 Malvern Road, Prahran, 3181
Phone 529 8899
Fax 529 4248

telling the reception staff so that they can fill in the patients name on the sheet provided. Reception staff are already aware of the study. I will contact reception at all the sports medicine centre clinics every two days. You will be provided with an information handout to give to the potential participants. Mentioning your endorsement of the study to suitable participants would greatly encouraged them to volunteer. For this I would be grateful.

Complete rate of recovery form. In order to ascertain the participant's rate of recovery, the treating physiotherapist will be asked to complete a rate of recovery form. The form, requesting the participant's type of injury, time expected for full recovery, and actual rate of recovery will be attached to the patient's file and will only take a minute to complete. A copy of the form is attached.

Thank you in anticipation of your cooperation. If you were interested in further information about the study please do not hesitate to contact me on 01405561 or leave a message at either Prahran or Malvern Sports Medicine Centre.

Kind regards,

Paulette Mifsud
Psychologist MAPS

**SPORTS MEDICINE CENTRES of VICTORIA**
A.C.N. 005 655 176

**FORM 1: Expected and Actual rate of recovery**

Type of Injury:
Expected Duration of Rehabilitation:

| Consultation/Recording Times | Rate of Recovery | | |
|---|---|---|---|
| | As expected | Slower | Faster |
| 1/52 weeks (initial consultation) | | | |
| /52 weeks (mid-way through rehabilitation) | | | |
| /52weeks (when told that they can return full participation) | | | |

**ALTONA** Westgate Sports Medicine Centre, Cnr. Dohertys Rd. & Grieve Pde., Altona Nth, 3018 **Phone (03) 9369 2444** Fax (03) 9369 8244
**ASHWOOD** Malvern Sports Medicine Centre, 330 High Street, Ashwood, 3147 **Phone (03) 9885 8961** Fax (03) 9885 8668
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# APPENDIX B

## Information for Participants

**SPORTS MEDICINE CENTRES of VICTORIA**
A.C.N. 005 655 176

*Principals:*

Dr. Peter J. Fuller, M.B.B.S., F.A.S.M.F., F.A.C.S.P.
Dr. Trefor James, M.B.B.S., F.A.S.M.F., F.A.C.S.P.
Dr. Peter Larkins, M.B.B.S., B.Med.Sc.(Hons.), F.A.S.M.F., F.A.C.S.P.
Dr. Barry Oakes, M.B.B.S., M.D., F.A.S.M.F.
Dr. Nicholas Van Wetering, M.B.B.S., F.A.C.S.P.
Dr. Gary Zimmerman, M.B.B.S., F.A.S.M.F., F.A.C.S.P.
*General Manager:*
Mr. Michael A. R. Kenihan

Mr. Michael A. R. Kenihan, Dip.Tech.Phys., Physiotherapist, F.A.S.M.F.
Mr. Steven M. Sandor, B.App.Sci.(Phty.), Physiotherapist
Mr. Terry Boyd, B.App.Sci.(Phty.), Physiotherapist
Ms. Lyn Watson, B.App.Sci.(Phty.), Grad.Dip.Manip.Ther.
Mr. Matthew Appleton, B.App.Sci.(Pod.), Podiatrist, F.A.A.P.S.M.
Mr. Gerard Healy, B.Ed.(Phys.Ed.), B.App.Sci.(Phty.), Physiotherapist
*Westgate Director:*
Ms. Ali Vasey, B.App.Sci.(Phty.), Grad.Dip.Manip.Ther.

Dear Potential Participant,

Thank you for considering being a participant in this study. As a psychologist who works in a sports medicine centre, I frequently consult with athletes who are injured. In an endeavor to provide best practice services I am conducting a study to further understand how injured athletes respond to rehabilitation and return to competition.

This study explores injured athletes perceptions and reactions to rehabilitation and return to competition. All that is required is that you fill out a questionnaire on 4 occasions. Whilst the initial questionnaire may take approximately 30 minutes to complete, subsequent questionnaires will take 10 to 15 minutes.

As a participant you can withdraw whenever you wish and without penalty. All results will be kept confidential and any publishable material will be based on group data. The study will not interfere with your physical rehabilitation.

If you are interested in participating in this research, please contact me on 014025561 or advise your practitioner and they will contact me.

Kind regards,

Paulette Mifsud
Psychologist MAPS

# APPENDIX C

## Medical and Research Consent Form

**Victoria University of Technology**
Ballarat Road Telephone
Footscray (03) 9688 4000
PO Box 14428 Facsimile
MCMC (03) 9689 4069
Melbourne
Victoria 8001
Australia

**Footscray Campus**
Department of
Physical Education
and Recreation
Telephone
(03) 9688 4470
(03) 9688 4473
Facsimile
(03) 9688 4891
International
61 3 9688 4891

VICTORIA UNIVERSITY OF TECHNOLOGY

# CONSENT FORMS FOR PEOPLE PARTICIPATING IN THE REHABILITATION AND RETURN TO FULL PARTICIPATION RESEARCH

**Form 1: Consent to gather medical information regarding the injury from the participant's physician and physiotherapist.**

As part of the research, medical information regarding the participant's injury, and recovery progress is needed. Consultation with the participant's physician and physiotherapist in order to gather this information is critical to the research. The information gathered will be held in the strictest confidence.

**Consent**

I give consent for the researcher to gather information regarding my injury, and recovery progress from my physician and physiotherapist.

Signed .....

Date .....

**Form 2: Informed Consent to participate in research.**

I acknowledge that the research procedures have been explained to me

I acknowledge that I have been given the chance to ask questions

I acknowledge that I may ask further questions at any time

I understand that my results will be confidential

I understand that I am free to withdraw at any time

Signed .....

Date .....

Thankyou very much for consenting to be part of our study.

Dr Mark Andersen

[redacted]

Paulette. M. Mifsud

[redacted]

# APPENDIX D

## Demographics and Background Questionnaire

**Victoria University of Technology**
Ballarat Road
Footscray

PO Box 14428
MCMC
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Victoria 8001
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and Recreation

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International
61 3 9688 4891

# REHABILITATION AND RETURN TO FULL PARTICIPATION FROM INJURY QUESTIONNAIRE

VICTORIA UNIVERSITY OF TECHNOLOGY

Dear Participant,

We are interested in exploring factors which may affect an athlete/dancers rehabilitation progress and their readiness to return to full sport participation. The information collected from your participation in this study will help rehabilitation practitioners design better programs to assist injured athlete/dancers in their return to full physical participation.

Your participation in this study is completely voluntary and you are free to withdraw consent and to discontinue participation at any point in time.

The survey comprises several parts. Some of these will be administered on three occasions during your rehabilitation; after your initial consultation, midway during rehabilitation and just prior to returning to full physical participation. Completing the initial questionnaire takes between 20 to 30 minutes. On subsequent occasions the questionnaire will take less than 10 minutes to complete.

All test results will be coded and no individual names will be used. Any published material will be based on the collective data of all participants involved in the study.

If you have any questions about the study please contact Paulette Mifsud on (03) 98897382.

Thank you for your interest and co-operation with this study.

Paulette Mifsud

## BACKGROUND

Date of Birth: _____ Sex: _____

Main Physical Activity: (eg., Basketball, Classical Ballet) _____

Level of Activity: (eg., Club, State, National, International, Recreational) _____

Amount of Physical Exercise per week. (eg., 10 hours) _____

Description of Injury: (eg: Grade 2 Ankle Sprain) _____

Date injury occurred: _____

Is this your first major injury? Yes/No

If 'No" what was/were your previous major injuries? _____

_____

# Appendix E

## Social Support Questionnaire

# SECTION A.

INSTRUCTIONS: The following questionnaire asks about people in your environment who provide you with support or help. Each question has two parts, firstly list all the people you know, excluding yourself,who you can count on in the described manner. Just give their initials and their relationship to you eg brother, sister, boyfriend etc.

For the second part of the question (the even numbers) circle how satisfied you are with the overall level of support you have. If you have had 'no support' for a question tick "no one", but still rate your level of satisfaction. 6 = very satisfied, 5 = fairly satisfied, 4 = a little satisfied, 3 = a little dissatisfied, 2 = fairly dissastisfied, 1 = very dissatisfied

1. Who can you count on to distract you from your worries when you feel under stress?

( ) No-one

| | | |
|---|---|---|
| 1) | 4) | 7) |
| 2) | 5) | 8) |
| 3) | 6) | 9) |

**2.** How satisfied are you with this support?

6 5 4 3 2 1

3. Who can you really count on to help you feel more relaxed when you are under pressure or tense ?

( ) No one

| | | |
|---|---|---|
| 1) | 4) | 7) |
| 2) | 5) | 8) |
| 3) | 6) | 9) |

**4.** How satisfied are you with this support?

6 5 4 3 2 1

5. Who accepts you totally including both your worst and best points ?

( ) No one

| | | |
|---|---|---|
| 1) | 4) | 7) |
| 2) | 5) | 8) |
| 3) | 6) | 9) |

**6.** How satisfied are you with this support?

6 5 4 3 2 1

7. Who can you really count on to care about you, regardless of what is happenening to you ?

( ) No one

| | | |
|---|---|---|
| 1) | 4) | 7) |
| 2) | 5) | 8) |
| 3) | 6) | 9) |

**8.** How satisfied are you with this support?

6 5 4 3 2 1

9. Who can you count on to make you feel better when you are generally feeling down in the dumps ?

( ) No one

| | | |
|---|---|---|
| 1) | 4) | 7) |
| 2) | 5) | 8) |
| 3) | 6) | 9) |

**10.** How satisfied are you with this support?

6 5 4 3 2 1

11 Who can you count on to console you when you are very upset ?

( ) No one

| | | |
|---|---|---|
| 1) | 4) | 7) |
| 2) | 5) | 8) |
| 3) | 6) | 9) |

**12.** How satisfied are you with this support?

6 5 4 3 2 1

# Appendix F

## Ways of Coping Checklist

## SECTION B

The following items describe ways in which people cope with setbacks encountered in everyday life. Please read each item below and indicate by circling the appropriate catagory, how frequently you have used this strategy since you became injured. (current injury)

| | Doesn't Apply | Not Used | Used Some -what | Used Quite a bit | Used A great deal |
|---|---|---|---|---|---|
| 1. Wished I was a stronger person more optomistic and forceful. | X | 0 | 1 | 2 | 3 |
| 2. Tried not to burn my bridges behind me, but left things open somewhat. | X | 0 | 1 | 2 | 3 |
| 3. Realized I brought this problem on myself. | X | 0 | 1 | 2 | 3 |
| 4. Slept more than usual. | X | 0 | 1 | 2 | 3 |
| 5. Came out of the experience better than I went in. | X | 0 | 1 | 2 | 3 |
| 6. Talked to someone to find out about the situation. | X | 0 | 1 | 2 | 3 |
| 7. Talked to someone about how I was feeling. | X | 0 | 1 | 2 | 3 |
| 8. Wished I could change what had happened. | X | 0 | 1 | 2 | 3 |
| 9. Daydreamed or imagined a better place than I was in. | X | 0 | 1 | 2 | 3 |
| 10. Stood my ground and fought for what I wanted. | X | 0 | 1 | 2 | 3 |
| 11. Refused to believe what had happened. | X | 0 | 1 | 2 | 3 |
| 12. Tried to forget the whole thing. | X | 0 | 1 | 2 | 3 |
| 13. Just took things one step at a time. | X | 0 | 1 | 2 | 3 |
| 14. Avoided being with people in general. | X | 0 | 1 | 2 | 3 |
| 15. Talked to someone who could do something about the problem. | X | 0 | 1 | 2 | 3 |
| 16. Concentrated on something good that could come out of the whole thing. | X | 0 | 1 | 2 | 3 |
| 17. Changed or grew as a person in a good way. | X | 0 | 1 | 2 | 3 |
| 18. Made a plan of action and followed it. | X | 0 | 1 | 2 | 3 |
| 19. Came out of the experience better than I went in. | X | 0 | 1 | 2 | 3 |
| 20. Had fantasies or wishes about how things might turn out. | X | 0 | 1 | 2 | 3 |
| 21. Wished the situation would go away or somehow be finished. | X | 0 | 1 | 2 | 3 |
| 22. I knew what had to be done, so I doubled my efforts and tried harder to make things work. | X | 0 | 1 | 2 | 3 |
| 23. Criticized or lectured myself. | X | 0 | 1 | 2 | 3 |

| | Doesn't Apply | Not Used | Used Some-what | Used Quite a bit | Used A great deal |
|---|---|---|---|---|---|
| 24. Thought about fantastic or unreal things (like perfect revenge or finding a million dollars) that made me feel better. | X | 0 | 1 | 2 | 3 |
| 25. Accepted sympathy and understanding from someone. | X | 0 | 1 | 2 | 3 |
| 26. Got professional help and did what they recomended. | X | 0 | 1 | 2 | 3 |
| 27. Asked someone I respected for advice and followed it. | X | 0 | 1 | 2 | 3 |
| 28. Bargained or compromised to get somethlng positive from the situation. | X | 0 | 1 | 2 | 3 |
| 29. Hoped a miracle would happen. | X | 0 | 1 | 2 | 3 |
| 30. Changed something about myself so I could deal with the situation better. | X | 0 | 1 | 2 | 3 |
| 31. Felt bad that I couldn't avoid the problem. | X | 0 | 1 | 2 | 3 |
| 32. Got mad at the people or things that caused the problem. | X | 0 | 1 | 2 | 3 |
| 33. Accepted my strong feelings but didn't let them interfere with other things too much. | X | 0 | 1 | 2 | 3 |
| 34. Blamed myself. | X | 0 | 1 | 2 | 3 |
| 35. Kept others from knowing how bad things where. | X | 0 | 1 | 2 | 3 |
| 36. Went on as if nothing had happened. | X | 0 | 1 | 2 | 3 |
| 37. Tried not to act too hastily or follow my own hunch. | X | 0 | 1 | 2 | 3 |
| 38. Came up with a couple of solutions to the problem. | X | 0 | 1 | 2 | 3 |
| 39. Accepted the next best thing to what I wanted. | X | 0 | 1 | 2 | 3 |
| 40. Tried to make myself better by eating, drinking, smoking, taking medications. | X | 0 | 1 | 2 | 3 |
| 41. Wished I could change the way I felt. | X | 0 | 1 | 2 | 3 |
| 42. Kept my feelings to myself. | X | 0 | 1 | 2 | 3 |

# Appendix G

## Daily Hassles Scale

## SECTION C

The questionnaire lists things that can be hassles and uplifts in day to day life. You will find that in the course of a fortnight some of these things will only be a hassle for you and others will only be an uplift. Others will have been both a hassle and an uplift.

DIRECTIONS: Please think about how much of a hassle and how much of an uplift each item was for you over the past fortnight. Please indicate on the left-handside of the page (under "HASSLES") how much of a hassle the item was by circling the appropriate number. Then indicate on the right hand-side of the page (under "UPLIFTS") how much of an uplift it was for you by circling the appropriate number.

Remember, circle one number on the left-hand side of the page and one number on the right-hand side of the page for each item.

| How much of a hassle was this item for you over the last fortnight? HASSLES<br>0 None or not applicable<br>l. = Somewhat<br>2.= Quite a bit<br>3.= A great deal | | How much of an uplift was this item for you over the last fortnight? UPLIFTS<br>0 None or not applicable<br>l. = Somewhat<br>2.= Quite a bit<br>3.= A great deal |
|---|---|---|
| 0 1 2 3 | 1 Your child(ren) | 0 1 2 3 |
| 0 1 2 3 | 2 Your parents or parents-in-law | 0 1 2 3 |
| 0 1 2 3 | 3 Other relative(s) | 0 1 2 3 |
| 0 1 2 3 | 4 Your spouse | 0 1 2 3 |
| 0 1 2 3 | 5 Time spent with family | 0 1 2 3 |
| 0 1 2 3 | 6 Health or well-being of a family member | 0 1 2 3 |
| 0 1 2 3 | 7 Sex | 0 1 2 3 |
| 0 1 2 3 | 8 Intimacy | 0 1 2 3 |
| 0 1 2 3 | 9 Family-related obligations | 0 1 2 3 |
| 0 1 2 3 | 10 Your friend(s) | 0 1 2 3 |
| 0 1 2 3 | 11 Fellow workers | 0 1 2 3 |
| 0 1 2 3 | 12 Client, customers, patients, etc | 0 1 2 3 |
| 0 1 2 3 | 13 Your supervisor or employer | 0 1 2 3 |
| 0 1 2 3 | 14 The nature of your work | 0 1 2 3 |
| 0 1 2 3 | 15 Your work load | 0 1 2 3 |
| 0 1 2 3 | 16 Your job security | 0 1 2 3 |
| 0 1 2 3 | 17 Meeting deadlines or goals on the job | 0 1 2 3 |
| 0 1 2 3 | (eg.,food, clothlng, housing, health care,taxes, lnsurance) | |
| 0 1 2 3 | 19 Enough money for education | 0 1 2 3 |
| 0 1 2 3 | 20 Enough money for emergencies | 0 1 2 3 |
| 0 1 2 3 | 21 Enough money for extras (eg entertainment, recreations, vacations) | 0 1 2 3 |
| 0 1 2 3 | 22 Financial care for someone who doesn't live with you | 0 1 2 3 |
| 0 1 2 3 | 23 Investments | 0 1 2 3 |
| 0 1 2 3 | 24 Your smoking | 0 1 2 3 |
| 0 1 2 3 | 25 Your drinking | 0 1 2 3 |
| 0 1 2 3 | 26 Mood-altering drugs | 0 1 2 3 |
| 0 1 2 3 | 27 Your physical appearance | 0 1 2 3 |
| 0 1 2 3 | 28 Contraception | 0 1 2 3 |
| 0 1 2 3 | 29 Exercise(s) | 0 1 2 3 |
| 0 1 2 3 | 30 Your medical care | 0 1 2 3 |
| 0 1 2 3 | 31 Your health | 0 1 2 3 |
| 0 1 2 3 | 32 Your physical abilities | 0 1 2 3 |
| 0 1 2 3 | 33 The weather | 0 1 2 3 |
| 0 1 2 3 | 34 News events | 0 1 2 3 |
| 0 1 2 3 | 35 Your environment (eg., quality of air, noise level, greenery) | 0 1 2 3 |
| 0 1 2 3 | 36 Political or social issues | 0 1 2 3 |
| 0 1 2 3 | 37 Your neighborhood (eg., neighbors, setting | 0 1 2 3 |
| 0 1 2 3 | 38 Conserving (gas, electricity water, gasoline, ctc ) | 0 1 2 3 |
| 0 1 2 3 | 39 Bets | 0 1 2 3 |
| 0 1 2 3 | 40 Cooking | 0 1 2 3 |
| 0 1 2 3 | 41 Housework | 0 1 2 3 |
| 0 1 2 3 | 42 Home repairs | 0 1 2 3 |
| 0 1 2 3 | 43 Yardwork | 0 1 2 3 |
| 0 1 2 3 | 44 Car maintenance | 0 1 2 3 |
| 0 1 2 3 | 45 Taking care of paperwork (eg., paying blls, filling out forms) | 0 1 2 3 |
| 0 1 2 3 | 46 Home entertainment (eg., Video, music, reading) | 0 1 2 3 |
| 0 1 2 3 | 47 Amount of free time | 0 1 2 3 |
| 0 1 2 3 | 48 Recreation and entertainment outside the house (eg., movies, sports, eating out, walking. | 0 1 2 3 |
| 0 1 2 3 | 49 Eating (at home) | 0 1 2 3 |
| 0 1 2 3 | 50 Church or community organizations | 0 1 2 3 |
| 0 1 2 3 | 51 Legal matters | 0 1 2 3 |
| 0 1 2 3 | 52 Being organized | 0 1 2 3 |
| 0 1 2 3 | 53 Social commitments | 0 1 2 3 |

# Appendix H

## Perception Questions, Perceived Confidence, and Readiness Scale

## SECTION D

Please answer the following questions by rating yourself on the scale ranging from 0% to 100%. 0% = Not at all Confident (Items 1 and 2) or Ready (Items 3 and 4), and 100% = Totally Confident or Ready.

1. "How confident do you now feel (psychologically) about meeting the demands of your rehabilitation program?" _____%

2. "How confident do you now feel (physically) about meeting the demands of your rehabilitation program?" _____%

3. "How ready are you now (psychologically) about returning to full participation?" _____%

4. "How ready are you now (physically) about returning to full participation?" _____%

## SECTION E

1. Please write below your reaction to (positive and negative thoughts and feelings) your rehabilitation process.

_____

_____

_____

_____

_____

2. Please describe some of the most important aspects that you believe influence the healing process and readiness to return to full participation.

_____

_____

_____

_____

_____

Thank you for your assistance

# Appendix I

## Recovery Index Form

**SPORTS MEDICINE CENTRES of VICTORIA**
A.C.N. 005 655 176

**FORM 1: Expected and Actual rate of recovery**

Type of Injury:
Expected Duration of Rehabilitation:

| Consultation/Recording Times | Rate of Recovery | | |
|---|---|---|---|
| | As expected | Slower | Faster |
| 1/52 weeks (initial consultation) | | | |
| /52 weeks (mid-way through rehabilitation) | | | |
| /52weeks (when told that they can return full participation) | | | |

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