

# **Coping with Injury and Daily Stressors in University Student Athletes**

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or

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## **Abstract**

While recent research has generated a great deal of useful information about the nature of the stressors facing injured athletes and the coping strategies used during injury rehabilitation, few studies have examined the actual experiences of injured student athletes. This study sought to begin to address this gap in the literature by exploring the stress and coping experiences of injured student athletes over the course of their rehabilitation. Nine university student athletes with athletic injuries were recruited to complete fourteen consecutive weekly journal entries describing their stressors and coping strategies related to the injury rehabilitation process and other areas of life. Five participants (three female and two male) provided full journal datasets and then completed semi-structured interviews after returning to sport. Grounded theory methodology was utilized to analyze the journal and interview data. Themes arose related to the student athlete lifestyle, stressors, psychological responses to injury, coping strategies and coping effects, coping processes and perceived benefits. The results are discussed within the context of models of sport injury rehabilitation and previous research on stress and coping with athletic injury. The study identified several stressors and coping strategies specific to injured student athletes. These include balancing intensive time demands, which became further strained with the addition of rehabilitation, the effect of the injury on employment, and related coping strategies. Strengths and limitations of the study are addressed, and recommendations for future research are made with respect to this specific population and, more generally, research on stress and coping with athletic injury. Recommendations regarding strategies to support injured student athletes are also offered.

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# Introduction

Injuries are a common occurrence in sport. According to Statistics Canada (2015), of the nearly 4.3 million total injuries that occurred over a two-year period (2009-2010), sport and exercise-related injuries accounted for 66% of the injuries sustained by youth aged 12 to 19, and 29% of injuries sustained by working-age adults. For competitive athletes, who invest a great deal of effort and time in order to reach optimal performance levels, a significant injury can be a traumatic and potentially career ending experience (Quinn & Fallon, 1999, p. 201). Researchers have made great strides in understanding athletes' psychological responses to injury and strategies used to cope with athletic injury. Student athletes, however, may face specific and unique challenges that differ from other members of their broader social groups, that is, non-athlete students and non-student elite athletes. As such, the injured student athlete's rehabilitation experiences may be quite different from those of non-student athletes. For instance, injury rehabilitation might be expected to place additional strain on a student athlete's concurrent educational demands. Student athletes have been included in some of the research that has explored psychological responses to athletic injury, however, few studies have specifically examined injury, stress, and the coping experiences of student athletes. The current study aimed to begin to contribute to this research by exploring the injury rehabilitation experiences of student athletes in the context of their managing day-to-day demands and stressors - the unique circumstances inherent in the "dual role" of student and athlete. The literature review that follows will first provide an overview of the major theories and definitions of stress and coping. Next, the existing research base and theoretical models related to sport-related stressors and coping, psychological responses to injury, and coping with athletic injury will be described. The unique stressors and challenges student athletes face will also be addressed throughout this review, and then a thorough rationale for the current study is provided.

## Definitions of Stress and Coping

Despite the common usage and lay understanding of the word 'stress' in everyday communication, definitions of stress in research have been greatly debated. The difficulty in forming a unitary definition of stress from a research perspective may

stem in part from the fact that stress researchers hail from various fields of study and conduct research on different elements of stress from multiple levels of inquiry, including biological, psychological, or social/environmental perspectives (Aldwin, 2007, p. 24). For instance, Hans Selye's (1974) General Adaptation Syndrome model of stress emphasized biological stress responses, and described how the body reacts to stress physiologically, beginning with acute physiological stress responses, such as the release of adrenaline. As stressors persist or become more chronic, physiological resources used to maintain the stress response become depleted, resulting in increased vulnerability to illnesses and reductions in immunocompetence. From a biological and physical health perspective, this model demonstrates the negative effects that prolonged stress can have on physical health, but the model has been critiqued for neglecting or underestimating the impact of psychological factors, such as cognitions, on stress (Mason, 1971).

Aldwin (2007) provided a definition of stress that she argued captures most aspects of the construct. In her definition, "...*stress refers to that quality of experience, produced through a person-environment transaction, that, through either overarousal or underarousal, results in psychological or physiological distress* (p. 24, italics in original). Lazarus and Folkman (1984) defined psychological stress as "...*a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her wellbeing*" (p. 19, italics in original). Both definitions emphasize the transactional nature of stress, although Lazarus and Folkman identified cognitive appraisals as central to the stress experience (more on this below), and both definitions suggest the stress experience is associated with some form of distress or threat to well-being. However, not all conceptualizations of stress are associated with distress. For instance, in his book *Stress Without Distress*, Selye (1974) described stress as "the spice of life" (p. 85). He argued that all activities in life involve some level of stress, and that an optimal level of stress is needed for optimal functioning and enjoyment in life. Lazarus (2000a) argued the experience of stress can involve negative and positive emotions, sometimes simultaneously. For example, individuals can feel both hope and anxiety during a stressful experience because the outcomes are uncertain (p. 231). Folkman and Moskowitz (2004) concurred, and noted that research has demonstrated that positive and negative emotions co-occur during experiences of stress (p. 747).

According to the Lazarus and Folkman (1984) transactional model of stress, cognitive appraisals determine whether situations are experienced as stressful. This model states that different types of appraisals, termed primary appraisals, secondary appraisals, and reappraisals, involve an assessment of both individual and situational factors. Thus, appraisals are context dependent. Primary appraisals refer to making the determination that a situation has relevance to one's well-being or values. If a particular situation is appraised as irrelevant or benign in this regard, stress is not experienced. The situation could, however, be appraised as already having caused one harm or loss, as threatening to cause one harm or loss, or as a challenge. The harm/loss, threat, and challenge appraisals indicate the situation is relevant to one's well-being or values. Secondary appraisals evaluate the availability of coping resources to deal with the harm/loss, threat, or challenge. When a situation or event is appraised as exceeding one's coping resources, the situation is experienced as stressful. Reappraisals refer to altered appraisals; previous appraisals are modified as the situation changes or new information becomes available. The stressful circumstance itself is referred to as a stressor (Taylor, Sirois, & Molnar, 2017, p. 157). Lazarus and Folkman (1984) also outlined properties of events that are stressors. These include novelty (i.e., no previous experience in the situation), duration (i.e., length of time), predictability (i.e., what was expected no longer is), imminence (i.e., anticipating an event), event uncertainty (i.e., probability of an event occurring), temporal uncertainty (i.e., knowing an event will happen but not knowing when), ambiguity (i.e., information needed to make an appraisal of the situation is not available or lacking), and timing of the event in relation to the life cycle (i.e., event occurs around the same time as other stressors).

Coping, generally speaking, refers to strategies used to manage stress experiences. More specifically, Lazarus and Folkman (1984) defined coping as "... *constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person*" (p. 141, italics in original). Folkman and Moskowitz (2004) summarized coping as "... a complex, multidimensional process that is sensitive both to the environment, and its demands and resources, and to personality dispositions that influence the appraisal of stress and resources for coping" (p. 747). Thus, while coping is influenced by trait-like personal characteristics, the process of coping involves transactions among multiple factors and resources that are dynamic and can change over time. Conceptualizing

coping only as a trait or characteristic of an individual suggests the person uses a singular or static approach to managing stress, regardless of situational or contextual factors. According to Lazarus (1999), “in all likelihood, an efficacious approach to coping depends on being flexible. In other words, the best coping should be responsive to the requirements of the stressful conditions being faced, which makes it process centred,” (p. 108). From this perspective, because the coping strategies selected to deal with stressors are based on various person and situation-specific factors which are constantly subject to change, no single coping strategy can be deemed more or less effective than another. The ever-changing elements of the person and situation can alter how adaptive or maladaptive a particular coping strategy will be (Lazarus, 1999, p. 113).

Researchers have been challenged in identifying and labelling different types of coping strategies. Empirical (e.g., using factor analysis) and rational (e.g., theory-driven) approaches have been used to describe distinct coping categories (Folkman & Moskowitz, 2004, p. 751), and various categorizations have been proposed. One of the most common categorizations of coping strategies was suggested by Lazarus and Folkman (1984). They defined coping strategies based on function: problem-focused and emotion-focused. Problem-focused coping strategies involve taking action to manage the problem by changing elements of one’s reality (either elements of the person or environment). In essence, problem-focused coping involves problem-solving – identifying the problem, developing options to deal with the problem, selecting an option and acting on it (p. 152). Emotion-focused strategies do not alter the reality of the situation, but rather aim to reduce or manage the distress brought on by the stressor. Emotion-focused coping (pp. 150-151) can involve cognitive reappraisals that alter the meaning of the event/situation (i.e., thinking about the event differently so it becomes less stressful) or other efforts that do not change the meaning of the event but instead help to reduce emotional distress brought on by the stressor, such as distraction or venting emotions.

Coping strategies have also been categorized as approach-oriented or avoidance-oriented. Approach-oriented coping refers to active efforts to address or manage a stressful situation, such as engaging in goal-setting or help-seeking behaviours, whereas avoidance coping refers to removing oneself from a stressful situation, either behaviourally (e.g., physical departure) or cognitively (e.g., distracting oneself with thoughts about other experiences; Endler, Parker, & Summerfeldt, 1998).

While problem-focused coping is often considered more approach-oriented and emotion-focused more avoidant-oriented, this is not always the case. Emotional-approach coping refers to a form of coping in which emotional reactions to stressors are faced, understood, and expressed or managed in adaptive ways (Austenfeld & Stanton, 2004). Proactive coping (Aspinwall & Taylor, 1997) refers to taking action to prevent or reduce the effects of a stressful event before it occurs. Proactive coping has also been referred to as preventative coping (Folkman, 2011).

Moos (1997, p. 58) noted that researchers have classified coping strategies in two ways, by the focus of the strategy (e.g., focused on the problem or on alleviating the emotions) or the method (e.g., coping through the use of cognitions or behaviours). However, the use of different coping labels across studies has made it difficult to establish conclusions about the use and effectiveness of coping strategies (Johnston & Carroll, 2000, p. 290). Further, coping strategies are not necessarily independent of one another and the use of one coping strategy may facilitate the use of another, for example, problem-focused coping is often facilitated by or used in conjunction with positive reappraisal (Folkman & Moskowitz, 2004, p. 753).

Research into coping effectiveness has also faced many challenges. Folkman and Moskowitz (2004, pp. 753-754) have stated that researchers must select appropriate outcomes (i.e., what end result indicates a coping strategy was effective) and consider the fit between the coping strategy and the situation (i.e., situation controllability). With respect to appropriate outcome selection, Folkman and Moskowitz (2004, pp. 754-755) outlined four research challenges. First, coping outcomes may impact proximal factors, such as reductions in physiological stress, or distal factors, such as improvements in functioning. Second, one coping strategy may have a positive impact on one outcome but a negative impact on another. For example, coping with a heavy workload by working evenings and weekends may improve work-related stress, but could have a negative impact on relationships or sleep. Third, some outcomes may emphasize resolution of the stressor, whereas some stressors are chronic or cannot be resolved, such as chronic disease. Fourth, determinations of coping effectiveness may vary depending on whose perception of effectiveness is being recorded, the research participant's or the researcher's. In terms of considering the fit between coping strategies and the situation, Folkman and Moskowitz noted that in situations deemed to be more controllable, problem-focused coping strategies would be theorized to be more effective,

whereas emotion-focused strategies would be more useful in low-control situations. However, they further stated that as situations change, so can the level of controllability.

Thus, as noted earlier, no one coping strategy can be deemed either completely effective or ineffective, as what is adaptive for one person or in one situation may not be under different circumstances. The flexible application of coping strategies across changing circumstances may be the most effective approach to coping. Cheng, Lau, and Chan (2014) recently conducted a meta-analysis of studies that have examined coping flexibility. They found that coping flexibility was associated with psychological adjustment, and, based on their review, conceptualized coping flexibility as "... cognitive astuteness in formulating coping strategies to meet specific situational demands and the possession of meta-coping skills that foster the implementation of flexible coping strategies," (p. 1599). The meta-coping skills included adaptation, evaluation, and monitoring (pp. 1598-1599). Thus, flexible coping involves the ability to evaluate the usefulness of coping strategies and adaptively apply (or stop applying) strategies based on those evaluations, and the continual monitoring of changing circumstances. This approach is opposed to a more rigid style of coping in which coping strategy selection is not based on dynamic situational demands.

Although researchers have faced challenges in examining stress and coping due to a lack of consensus on definitions and coping categorizations, research into these constructs continues in many areas of study, including sport psychology. Studies that have examined stress, coping, and coping effectiveness in relation to sport, student athletes, and athletic injury are discussed next.

## **Stress and Coping in Sport**

Coping in sport has been researched since the 1990's, and successful coping is an important factor in satisfaction and performance in sport (Nicholls & Polman, 2007). Based on their review, Nicholls and Polman (2007) concluded that most research conducted in this area has supported the process conceptualization of coping, as described above. Athletes face numerous stressors related to their sport involvement, and these stressors require athletes to employ coping strategies to manage stress and ensure successful sport performance. In a recent review of sport related stressors, Nicholls (2016) argued that longitudinal studies suggest athletes experience multiple and

diverse stressors, but some specific stressors occur with greater frequency. For instance, mental errors, physical errors, difficulties with coaches, and injuries were among the most commonly reported stressors in two studies that utilized diary methods to examine athletes' experiences with stress and coping over approximately one month periods (Nicholls, Holt, Polman, & Bloomfield, 2006; Nicholls, Jones, Polman, & Borkoles, 2009). In a cross-sectional study by Galli and Vealey (2008), ten current or previous college and professional athletes were asked to identify the most difficult sport-related adversity they had experienced. Five of the ten athletes identified an injury as the most difficult adversity; the other adversities identified included a performance slump, burn-out, illness, and transition to college. The adversities reported in a cross-sectional qualitative study of five elite female university athletes from various sports (track and field, swimming, long-distance running, and basketball) included performance slumps, conflicts with coaches, bullying, eating disorders, sexual abuse, and injuries (Tamminen, Holt, & Neely, 2013). Thus, these studies suggest athletes encounter various sport-related stressors, and that injury-related stressors are among the stressors more commonly reported by professional and university/college level athletes.

In adopting a process conceptualization of coping, a number of studies have utilized longitudinal research designs and collected data at multiple points in time. Nicholls and colleagues (2006) explored sources of stress and coping strategies in eight elite rugby players. Using a daily diary methodology over 28 days, the athletes completed a sport/performance related stressor checklist, described their coping responses, and indicated their perception of coping effectiveness on a Likert-type scale. The most commonly reported stressors were injuries, mental errors, and physical errors. Based on their analyses, coping strategies used by the athletes were categorized as problem-focused (e.g., increasing effort, increasing concentration, reducing injury symptoms, planning), emotion-focused (e.g., relaxation, positive reappraisal), avoidance (e.g., blocked thoughts), or no coping strategy reported. Problem-focused strategies were reported more frequently than other categories of coping. The athletes in this study also rated the perceived effectiveness of their coping strategies. Those rated as the most effective included increasing effort, increasing concentration, and positive reappraisal. However, the rated effectiveness of each strategy varied when applied to different stressors.

Similar results were found by Nicholls et al. (2005) with respect to reported stressors and coping strategies. This qualitative study examined sport-related stress and coping responses in eleven elite adolescent golfers over one month. The most commonly reported stressors included physical errors, mental errors, success of opponents, and weather conditions. The athletes in this study reported using various coping strategies to manage the stressors. The researchers grouped the coping strategies into three major categories based on coping function; problem-focused, emotion-focused, and avoidance. Problem-focused coping included using behavioural strategies, such as making technical adjustments or using a pre-shot routine, and cognitive strategies (e.g., using “swing thoughts”). Other problem-focused strategies were identified separately, including preparation strategies, adjusting concentration, and goal-setting. Emotion-focused coping included relaxation strategies, acceptance, and social support. Avoidance coping strategies were nearly completely cognitive in nature (e.g., blocking thoughts). While problem-solving coping strategies as a group were the most commonly reported, cognitive avoidance was singularly reported with the highest frequency.

Using a similar study design, Nicholls et al. (2009) found the most frequently reported stressors among five professional rugby players over a 31-day period were physical errors, mental errors, injury, and coach criticism. The most frequently reported coping strategies were increased concentration, thought blocking, increased effort, and staying focused on one’s role. The researchers also found the reported stressors were context dependent—some stressors were reported more frequently during training compared to competition. Perceptions of coping effectiveness were associated with emotional intensity; the athletes in the study reported greater coping effectiveness when emotional intensity was lower, as was more the case during training days compared to competition days. However, the researchers noted the causality of this association, that is, whether emotional intensity reduced coping effectiveness or lower coping effectiveness increased emotional intensity, could not be determined based on the study design.

Instead of identifying specific stressors encountered by athletes, Thatcher and Day (2008) argued it may be more useful to identify the shared properties of events and circumstances that lead to the experience of stress. The eight properties of stress identified by Lazarus and Folkman (1984; novelty, predictability, event uncertainty,

imminence, duration, temporal uncertainty, ambiguity, and timing in relation to the life cycle, described in more detail above) were employed to explain why a personally meaningful event could be appraised as stressful to one individual but not another. Using a sample of sixteen elite trampolinists, Thatcher and Day (2008) employed a qualitative interview methodology to determine if these eight properties of stress applied to the experiences of their participants. Their results confirmed that the eight properties of stress did apply and that two other properties of stress were identified, which were termed Self and Other Comparisons and Inadequate Preparation. Self and Other Comparisons refers to stress appraisals that arise from making performance comparisons to other athletes, and Inadequate Preparation refers to stress appraisals that arise from feeling unprepared for competition. The authors concluded that, should future research support their findings, application of this knowledge may include identifying and reducing these properties of stress to reduce athletes' stress appraisals.

Some researchers have adopted a different approach to studying stress and coping in athletes by applying a resilience model or framework. Resilience has been defined as "the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances," (Masten, Best, & Garmezy, 1990, p. 426). Thus, resilience research in sport is concerned with athletes' experiences of successful adaptation in the face of adversity or stressors. Using a qualitative interview methodology, Galli and Vealey (2008) explored the resilience process with ten elite athletes as it related to overcoming the most difficult sport-related adversity experienced by those athletes. Their results suggested resilience is a process affected by individual and social-environmental factors. They argued their findings indicated resilience occurs over time through the process of attempting to cope and deal with adversity and the accompanying negative emotions, an experience the authors termed "agitation." Personal resources or personality characteristics, such as persistence and commitment to sport, and sociocultural factors, such as social support and racial obstacles, influenced this process. Various coping strategies were employed, such as positive reinterpretation, problem-solving, and acceptance. The athletes in this study described a number of positive outcomes associated with dealing with adversity, including learning, feeling stronger, gaining perspective, becoming motivated to help others, and becoming more aware of their resources. These perceived positive outcomes were seen as an important part of the resilience process, and the authors stated, "...athletes who possess

the requisite personal and sociocultural resources may not only successfully respond to sport adversity, but gain resources that will allow them to successfully respond to adversity in the future,” (p. 330). Similarly, Tamminen and colleagues (2013) found that, despite the negative experiences associated with facing sport-related adversities, athletes described experiencing growth following their adversity, such as becoming more aware of their strengths, gaining perspective, and developing a desire to help others. However, the authors noted that growth did not necessarily follow from all adverse experiences. Rather, growth occurred if the athletes derived meaning from their experiences—specifically, realizing the importance of social support and sport in their lives.

Fletcher and Sarkar (2012) developed a grounded theory of psychological resilience in elite athletes. They interviewed twelve Olympic athletes about their experiences in managing challenges and pressures associated with their sports. The resulting theory suggested that various psychological factors (motivation, focus, perceived social support, confidence, and positive personality) are protective against the deleterious effects of stressors by affecting cognitions in positive ways. More specifically, the authors theorized that these factors facilitated the use of challenge appraisals (i.e., viewing adversity or stressors as opportunities for positive growth or development) and meta-cognition (i.e., awareness of one’s own thoughts and the potential effects of thoughts, and the ability to alter/manage one’s thoughts in adaptive ways). The theory further suggested these psychological factors and adaptive cognitions facilitate adaptive responses to managing stressors and propel sport performance excellence.

Mental toughness has been identified as a personal resource that facilitates adaptive responses to stress. Defining this construct, however, has also been challenging. Sheard (2013), for instance, suggested mental toughness may be the least understood concept in sport psychology (p. 5). Mental toughness within the context of collegiate sport has been defined as “...the ability to be more consistent and better than your opponent in remaining determined, focused, confident and in control under pressure” (Madrigal, Hamill, & Gill, 2013, p. 74). This definition emphasizes mental toughness within the context of competition and performance. Others have stated mental toughness is not a narrow construct, nor is it an athlete-specific or sport-specific characteristic, but rather consists of a broad range of traits and skills (Kremer, Moran, Walker, & Craig, 2012, p. 115) that comprise an overall positive mindset (Sheard, 2013,

p. 67). Kremer et al. (2012) defined mental toughness as "...a multidimensional personality construct that defines the ability to persevere towards goal accomplishment through the display of resilience and hardiness, and irrespective of circumstance, success or failure" (p. 114). A number of studies of sport-related stress and coping have found mental toughness to be associated with greater use of problem-focused or approach coping strategies and less use of avoidance coping strategies (Kaiseler, Polman, & Nicholls, 2009; Nicholls, Polman, Levy, & Backhouse, 2008). Further, Kaiseler et al. (2009) found that athletes with higher levels of mental toughness and emotional control had lower levels of perceived stress, regardless of the type of stressor. Thus, there is consensus that the ability to cope with adverse situations is an integral component of mental toughness, but that being able to cope effectively is just one aspect of mental toughness.

In summary, the above review of the research indicates that athletes report various sport or performance-related stressors. Some stressors, however, may be more common, including physical errors, mental errors, and injuries. While a number of studies have attempted to identify the specific sources of stress that athletes face, it has been suggested that targeting the properties of stress and intervening to lessen the impact of or develop ways to cope with those properties may be a more useful approach (Thatcher & Day, 2008). Although athletes use various coping strategies to manage stress, including problem-focused, emotion-focused, and avoidance strategies, some of the research reviewed found that problem-focused coping strategies were used more often, although the avoidance strategy cognitive "blocking" was also used regularly. The effectiveness of coping strategies may be related to levels of emotional intensity and, in line with the transactional model of stress and coping (Lazarus & Folkman, 1984), effectiveness can vary depending on the type of stressor to which the strategy is applied. While sport-related stressful experiences and adversities are associated with negative outcomes and emotional states, particular psychological and social factors support adaptive coping, resilience, sport performance, and stress-related growth. Studies of resilience in athletes extend beyond identifying coping strategies used by athletes, and place the athlete within the context of multiple personal and social-environmental resources that support adaptive responses to stress and adversity, suggesting that the use of specific coping strategies may be just one component of successful adaptation. Those resources may support the use of effective cognitive coping strategies.

## **Stress and Coping as a Student Athlete**

Recent research has found that the level of stress and mental health issues experienced by university students is a growing concern. For instance, a systematic review and meta-analysis of the effectiveness of interventions targeting stress reduction in university students found that approximately half of the students included in the studies reviewed reported moderate levels of stress-related mental health issues (Regehr, Glancy, & Pitts, 2013, p. 7). In a sample of 374 university students, Beiter et al. (2015) found that 11%, 15%, and 11% of students reported severe or extremely severe levels of stress, anxiety, and depression, respectively. Another study examined university students' levels of psychological distress prior to beginning university and at multiple time points over the course of the following three years (Bewick, Koutsopoulou, Miles, Slaa, & Barkham, 2010). The results indicated that levels of anxiety and depression generally worsened with degree progression, and at no point were levels of psychological distress as low as reported prior to beginning university. Similarly, Pritchard, Wilson, and Yamnitz (2007) reported undergraduate students' self-reported physical health decreased and symptoms of psychological distress increased over the first year of college. Certainly, the post-secondary experience is very stressful for many students, and can be associated with increased levels of psychological distress and reductions in well-being.

Compared to non-athlete students, student athletes report increased stress on a number of variables, including relationship concerns, time management, having many responsibilities, and heavy demands from extracurricular activities (Wilson & Pritchard, 2005). Demands related to time management and scheduling have been cited as being particular sources of stress for student athletes (Jolly, 2008; Wilson & Pritchard, 2005). Macquet and Skalej (2015) explored time management strategies used by twelve first and third year elite student athletes who participated in a highly structured athletic training and educational program, referred to as the Sport and Academic Training Center (SATC). In these settings, student athletes' schedules are almost entirely determined by the SATC, with very little time to spare for non-training or non-academic endeavors. Indeed, the researchers stated the student athletes in this study "... did not and could not waste time," (p. 357). Using interviews and qualitative methodology, it was determined that the student athletes typically employed both problem-focused and

emotion-focused coping strategies in coping with their intensive time demands, although first-year student athletes reported using more emotion-focused strategies and sought more social support. In making decisions about how to manage time, the student athletes in this study described using their previous experience to guide their decision-making, and selected strategies that were expected to support their well-being and performance. Previously used strategies were adapted and applied to current time management dilemmas.

In another recent qualitative study, 20 Australian university student athletes reported their most prominent stressors included scheduling conflicts, fatigue, finances, and coaches' demands regarding time commitments (Cosh & Tully, 2015). Although the researchers found that the student athletes in this study reported using minimal coping strategies, practical and emotional social support received from parents and coaches was highlighted as being important in coping with stressors. The participants also reported coping through balancing their demands, which was accomplished by making adjustments to study schedules, changing courses, skipping classes, and reductions to a part-time school workload. The authors noted that many of these strategies reflected forgoing academic success and setting lower academic standards in order to achieve more within the realm of sport. The authors concluded that the athletes in this study used more emotion-focused coping strategies than problem-focused, and noted this may be due to many stressors being outside of their control, such as scheduling problems. A notable limitation of this study, however, is that data were collected at only one time point.

Given the stressors experienced by student athletes, some have argued that this group of young adults is at a particular risk for developing psychological distress (Pinkerton, Hinz, & Barrow, 1989). Student athletes have reported lower levels of wellness (Watson & Kissinger, 2007) and less positive attitudes toward seeking counselling (Watson, 2005) compared to non-athlete students. In addition, student athletes have reported engaging in higher levels of binge drinking and experience more problems associated with alcohol than non-athlete students (Martens, Dams-O'Connor, & Beck, 2006; Nelson & Wechsler, 2001). Female athletes have been found to demonstrate higher rates of eating disorder symptoms than non-athletes (Holm-Denoma, Scaringi, Gordon, Van Order, & Joiner, 2009).

Some studies, however, have reported lower levels of self-reported symptoms of psychological distress in student athletes compared to non-athletes. For instance, male intercollegiate athletes reported fewer depressive symptoms than male non-athletes (Proctor & Boan-Lenzo, 2010), and university athletes reported lower levels of overall psychopathology compared to a normative sample (Donahue et al., 2004). Female student athletes reported higher levels of depressive and social anxiety symptoms than male student athletes and non-athletes of both genders; however, the proportion of female athletes with clinically significant levels of distress was not significantly different from the other groups (Storch, Storch, Killiany, & Roberti, 2005). In a national study of student athletes' college experiences, an overwhelming majority reported satisfaction with their post-secondary experiences and viewed their athletic involvement as an important part of their personal and academic development (Potuto & O'Hanlon, 2007).

Involvement in sport has been researched as a coping strategy in and of itself. Kimball and Freysinger (2003) conducted interviews with a group of student athletes, and found that although participation in sport can be a source of negative stress for the student athletes, it was also a source of positive stress and a means of coping. They stated, "... experiences of stress are multi-dimensional and dynamic... stress as a student-athlete is experienced both negatively *and* positively and changes across situations and over time" (p. 134). For example, they found that sport involvement led to feelings of enhanced self-determination (a sense of choice and control), which helped to buffer the effects of stress experienced as a result of sport involvement or stressors related to other life areas. However, depending on the situation, sport involvement also led to feelings of reduced self-determination, and as such was a source of stress. Similarly, for the student athletes in this study, sport involvement was associated with social support as a means of coping with their everyday lives, but for those who experienced a lack of social support because of sport involvement (e.g., exclusion from non-athlete activities or lack of support for involvement in non-athletic activities), sport became a source of stress.

Recent concerns regarding the levels of stress and related mental health issues found in university students have been reported, and some forms of psychological distress may be more prevalent in student athletes. The few studies that have examined stress and coping in student athletes specifically have revealed that managing time, demanding schedules, and multiple responsibilities associated with their various roles

appear to be prominent stressors for student athletes. These stressors are not captured by the general body of research on stress and coping in athletes, in which sport or performance related stressors and coping strategies have been explored more explicitly. Generalizing knowledge of stress and coping in athletes to student athlete populations has the potential to overlook significant stressors unique to these young athletes. Further, for student athletes, sport involvement can be positively or negatively associated with social support, and can be experienced as both a source of stress and a coping resource. In terms of coping strategies used by student athletes, the results of the studies reviewed above varied; one study found student athletes used very few strategies, whereas another study found student athletes used problem and emotion-focused strategies, but the use of those strategies varied by post-secondary year and experience. Overall, it is evident that the unique stress and coping experiences of student athletes warrant further investigation.

## **Sport Injury and Rehabilitation**

As an athletic injury is a biological event, damage to the physical body requires the work of multiple body systems to support healing and physical recovery. Focusing solely on the biological factors, however, neglects the impact of psychological and social factors that influence and are influenced by the injury and the rehabilitation process (Brewer & Redmond, 2017). The biopsychosocial model of sport injury rehabilitation described by Brewer, Anderson, and Van Raalte (2002; cited in Brewer, 2007) emphasizes the need to consider biological (e.g., injury characteristics, immunity, sleep, nutrition, etc.), psychological (e.g., personality, cognitions, emotions, and behaviours), and social (e.g., social support, rehabilitation services, sport culture, etc.) factors that can impact rehabilitation. The model asserts that biopsychosocial factors exert bidirectional forces that may interact with injury characteristics, sociodemographic factors (e.g., age, gender, ethnicity), intermediate rehabilitation outcomes, such as recovery progress, pain, and strength, and sport injury rehabilitation outcomes, including return to sport and performance. This holistic model emphasizes the need to consider biomedical, psychological, and social aspects of the injury rehabilitation process, highlighting that factors within each area can have reciprocal effects.

Brewer (2007) argued that although the biopsychosocial model asserts psychological factors can impact injury rehabilitation processes, the model does not

explain how. According to Brewer, cognitive appraisal models, such as the integrated model of responses to sport injury by Wiese-Bjornstal, Smith, Shaffer, and Morrey (1998) can be used as a framework for studying how the various factors involved in injury rehabilitation affect one another and injury outcomes. The Wiese-Bjornstal et al. (1998) model integrates pre-injury and post-injury person-level and situation-level factors in explaining responses to injury and recovery outcomes. The model outlines a process that begins with the occurrence of an injury, which is viewed as a stressor. Throughout the process, dynamic and bidirectional effects of those person-level (e.g., personality, motivation, age, gender, ethnicity, etc.) and situation-level (e.g., nature of the injury and sport, social support, access to rehabilitation services, etc.) factors interact with cognitive appraisals. Cognitive appraisals are central to the model; one's perceptions of the injury, the self, and available supports influence psychological responses, that is, behaviours, thoughts, and emotions, to the injury. These appraisals are also subject to reappraisal as circumstances or responses change. According to the integrated model, psychological responses can vary over time, include coping responses, which can be behavioural, cognitive, or emotional, and impact rehabilitation outcomes. Thus, this multidimensional and comprehensive model places the athlete and the injury within a broader socioenvironmental context, and considers the multiple and diverse ways athletes respond and adjust to injury (Brewer & Redmond, 2017).

## **Psychological Responses to Injury**

**Cognitive responses.** According to the transactional model of stress (Lazarus & Folkman, 1984) and the integrated model of responses to sport injury (Wiese-Bjornstal, et al., 1998), cognitive appraisals occur in response to stressors (the injury), and play a major role in determining subsequent cognitive, emotional, and behavioural responses. Thus, cognitive appraisals are a dynamic and ongoing response to injury. Other cognitive and emotional changes can also occur in response to injury, such as reductions in self-esteem (Tracey, 2003), confidence (Quinn & Fallon, 1999), and athletic identity (Brewer, Cornelius, Stephan, & Van Raalte, 2010). In line with the integrated model, Quinn and Fallon (1999) found levels of confidence changed over the course of rehabilitation; confidence was highest at the beginning of rehabilitation, dropped over the rehabilitation course, and then increased again upon recovery. In another study, cognitions and appraisals were associated with emotional reactions in ten

injured university student athletes and changed over time (Tracey, 2003). Negative thoughts and emotions were reported earlier in the rehabilitation process, but as time went on, the athletes in that study described feeling more optimistic and that they had refocused their thoughts onto positive things or reframed their perspectives to view the situation as a challenge or an opportunity for growth.

Shifts in athletic identity have also been described in response to athletic injuries specifically, and more generally, by athletes facing other sport-related adversities. Regarding the former, maintaining athletic identity was identified as a source of motivation to return to sport following serious injury (Podlog & Eklund, 2006). Regarding the latter, female athletes who faced various sport-related adversities described questioning their reasons for continued sport involvement, their love of sport, and their athletic identities (Tamminen et al., 2013). Erikson (1959) argued that the formation of identity is a central psychosocial task for those in emerging adulthood; to decide and commit to who one is and will be with respect to values and ideology, occupation, and relationships. Marcia (1994) outlined four identity statuses that may manifest during this process of identity formation: identity achievement (commitment to an identity after an exploration of possible choices), moratorium (exploring possible choices, but still uncommitted), foreclosure (commitment to an identity but not having undertaken an exploration of options), and identity diffusion (not committed to an identity). A major stressor or adversity, such as a serious athletic injury, could elicit disruptions to a developing or established identity. For instance, Brewer et al. (2010) found that athletic identity decreased over a two-year period following ACL surgery and rehabilitation, and this relationship was particularly pronounced in individuals with slower recoveries.

**Emotional responses.** Research has shown that athletes can experience various negative and positive emotions in response to injury. Tracey (2003) found that during the time between injury onset and a few weeks of rehabilitation, university athletes experienced a number of negative emotional responses, such as anger, frustration, depression, worries, and fears (e.g., of missing out on sport or losing fitness), and some athletes described experiencing a “roller-coaster” of emotions, both shortly after injury (p. 283) and as they came closer to returning to sport (p. 287). Prior to returning to competitive sport, negative emotions, such as fear of re-injury and other anxieties, and positive emotions, such as excitement, were reported by twelve competitive amateur and semi-professional injured athletes (Podlog & Eklund, 2006). In

a study of twenty-one elite athletes who experienced season-ending injuries, Udry, Gould, Bridges, and Beck (1997) found emotional responses included emotional agitation (e.g., anger, panic, and worry), feelings of self-pity, shock, isolation, and emotional depletion (e.g., feeling depressed or disappointed), and for some athletes the emotional responses changed over time. Ruddock-Hudson, O'Halloran, and Murphy (2012; 2014) found injured professional football players described many negative emotions in response to their injuries, including anger, frustration, shock, worry, and feelings of isolation. The emotional responses of football players with long-term injuries were also described as inconsistent and fluctuating between negative and positive mood states (Ruddock-Hudson et al., 2014), with more severe and long-term injuries described as more challenging and associated with more negative emotional reactions (Ruddock-Hudson et al., 2012). Quinn and Fallon (1999) measured some of the negative and positive emotions experienced by elite injured athletes at four times between injury onset and recovery. They found athletes' reports of negative emotions (depression, anger, tension, confusion, and fatigue) were highest within one week of the injury and decreased over time, with the positive emotion vigor being lowest immediately following the injury and increasing over time. While positive emotional responses during injury rehabilitation have been reported in some cases, Brewer and Redmond (2017) concluded that the overall evidence suggests athletic injury negatively impacts emotional functioning. However, it is also evident that emotional responses fluctuate throughout rehabilitation.

Individuals who have experienced traumatic injuries are at increased risk of developing symptoms of psychological distress, including depression, posttraumatic stress disorder, and anxiety disorders (Bryant et al., 2010). Athletes may suffer more severe psychological problems post-injury, as evidenced by increased symptoms of psychological distress. Injured and non-injured student athletes were compared on symptoms of depression (Appaneal, Levine, Perna, & Roh, 2009). Based on clinician ratings, injured athletes had higher levels of symptoms of depression than their non-injured counterparts at one-week post injury and remained higher at one-month post injury. Symptoms of psychological distress other than depression have also been reported following injury in athletes. Shuer and Dietrich (1997) examined symptoms of posttraumatic stress in a group of chronically injured elite student athletes (NCAA Division 1). The athletes scored significantly higher on levels of avoidance compared to

levels reported by victims of natural disaster and scored within the same range as those victims on levels of intrusive experience. One study found that adolescent athletes demonstrated elevated symptoms of posttraumatic stress post-injury, even after having recovered physically (Newcomer & Perna, 2003). The presence of psychiatric disorders following traumatic injury have been shown to be associated with impairments in activities of daily living, reductions in ratings of health status, and lack of return to occupation, whether that be employment or other primary activity such as being a student or volunteer (Zatzick et al., 2008). By extension, the presence of a psychiatric disorder following a traumatic athletic injury may delay or lead to problems in returning to sport.

**Behavioural responses.** Behavioural responses to injury include behavioural coping strategies, such as working towards rehabilitation goals, and rehabilitation program adherence. Rehabilitation program requirements can vary, but may include completing rehabilitation exercises at home, attending physiotherapy/rehabilitation clinic appointments, applying ice, medication use, and avoiding activities that may be detrimental to the rehabilitation process (Brewer, 1998). One behaviour that may be expected, or even required, of injured athletes is continued attendance of team practices and games while rehabilitating. Attending practice can be associated with feelings of frustration at not being able to participate, and some athletes may choose not to attend because of the emotional difficulty it can create (Tracey, 2003, p. 285).

**Perceived benefits and stress-related growth.** Not all psychological responses following injury and rehabilitation are negative. As described earlier, athletes have reported both positive and negative emotional responses to injury, and have described positive outcomes as a result of facing various challenges and adversities as a part of their sport involvement, such as personal growth, becoming stronger, and learning (Galli & Vealey, 2008; Tamminen et al., 2013). Posttraumatic growth, a similar construct, has been described by Calhoun and Tedeschi (2001) as "...positive change that the individual experiences as a result of the struggle with a major loss or trauma" (p. 158). Studies on the perceived benefits and positive growth following injury as a specific stressor or adversity have identified a number of benefits associated with the rehabilitation and return to sport process. Summarizing the findings across several studies, these benefits include: a) personal development (e.g., increased confidence, academic performance, empathy), b) enhanced social support, c) physical, tactical, and

technical improvements (e.g., improved nutrition, awareness of anatomy, improved strength), d) enhanced resilience (e.g., increased confidence in ability to cope in the future, enhanced mental toughness), e) enhanced performance (e.g., enhanced motivation), and f) improved cognitive and emotion regulation skills (e.g., cognitive reframing; Podlog & Eklund, 2006; Tracey, 2003; Udry, et al., 1997; and Wadey, Evans, Evans, & Mitchell, 2011). The rehabilitation process has also been described by athletes as both a learning experience and an obstacle to overcome (Tracey, 2003, p. 288). Studies by Tracey (2003) and Podlog and Eklund (2006) also demonstrated negative responses to injuries can co-occur with positive responses such as perceived benefits. Thus, it is important to note that although athletes may perceive some benefits to the rehabilitation process, they may also simultaneously experience some level of distress. These findings are in line with the resilience model research described above, which suggests that athletes can experience positive growth and other benefits as a result of overcoming adversities.

In an effort to identify the ways in which athletes find benefits in their injury rehabilitation experiences, Wadey and colleagues (2011) investigated the mechanisms underlying the perceived benefits associated with sport injury. Ten previously injured athletes were interviewed about their injury experiences at three times during rehabilitation. The results indicated the participants engaged in a number of activities that led to the perception of various benefits. These included seeking out information and increasing their knowledge about injuries and rehabilitation, disclosing emotions to others, activating social networks for support, sticking to rehabilitation plans, reflecting on the injury experience and altering perspectives, and working on tactical skills and training in other ways.

More recently, Roy-Davis, Wadey, and Evans (2017) proposed the term Sport Injury-Related Growth (SIRG) to refer to the perceived changes and benefits "...that propel injured athletes to a higher level of functioning than that which existed before their injury" (p. 36). This term was proposed to acknowledge the uniqueness of athletic injury rehabilitation compared to other stressors or traumatic events that may be associated with perceived benefits or growth. Further, Roy-Davis and colleagues stated this construct takes into account injury rehabilitation context and processes, and encompasses both psychological and physical perceived changes, like the various perceived benefits identified above. These researchers conducted a qualitative interview

study of 37 injured athletes with the purpose of developing a grounded theory of SIRG. Participant age range was 19 to 39 years. Participants played multiple sports at varying levels of competition, from recreation to elite. While the injured athletes in this study reported ongoing strain during the rehabilitation process, multiple factors were identified that supported SIRG, including internal factors, such as coping styles and previous experiences, and external factors, such as an increase in free time and received social support. With respect to coping, the participants in this study reported using various problem-focused and emotion-focused coping strategies. Further, meta-cognitions, positive cognitive reappraisals, positive emotional states, and facilitative responses, such as seeking information and rehabilitation adherence, were identified as mechanisms that supported SIRG.

In sum, athletes experience various cognitive, emotional, and behavioural responses to injury, and some might experience more significant psychological distress post-injury and during recovery. However, research has shown that injured athletes also experience positive emotions and perceive benefits associated with the injury and rehabilitation process. These negative and positive psychological responses can occur simultaneously, change over time, and may affect rehabilitation outcomes (Brewer, 2010). Studies are beginning to identify mechanisms through which benefits or growth are experienced.

## **Coping with Injury**

As described, the integrated model of responses to sport injury (Wiese-Bjornstal et al., 1998) indicates that the psychological responses to injury include coping responses. When looking specifically at coping with the effects of a sport injury, research has demonstrated that athletes utilize multiple coping strategies. However, coping strategy categorization has varied across studies, as will be seen in the review below. Some studies have categorized coping strategies in terms of the function (problem or emotion-focused) and others in terms of method (e.g., cognitive vs. behavioural or active vs. passive). In addition, coping strategy categorizations are not always isolated in terms of a discrete function or method. For instance, some categorizations have combined both managing thoughts and emotions (Gould, Udry, Bridges, & Beck, 1997), and avoidance coping can be behavioural or cognitive (Carson & Polman, 2010).

Through retrospective interviews aimed at exploring psychological responses to season-ending injuries, Udry and colleagues (1997) found that elite athletes (21 USA Ski Team members) identified a number of coping strategies used to cope with the experience. The athletes reported using positive (motivational) coping thoughts, focusing on recovering or the future, and acceptance/dealing with the injury and its consequences (p. 237). In a study aimed at exploring coping responses specifically with the same group of elite skiers (Gould et al., 1997), the athletes reported using the following coping strategies: “driving through,” which involved doing normal activities, focusing on setting and accomplishing goals, focusing on rehabilitation, and staying motivated (p. 384), as well as distraction, managing thoughts and emotions, seeking social resources, avoidance/isolation, and using experience from previous injuries. The athletes in this study also identified several factors that facilitated the recovery process. These factors differed from coping strategies in that the coping strategies were considered to be under the athletes’ control, whereas facilitating factors were present but not under the athletes’ control. These facilitating factors included interpersonal resources, such as social and rehabilitation support and being in contact with and rehabilitating with others with injuries, high quality and accessible medical care, other resources (e.g., training facilities), positive/fortunate circumstances, such as being in good health and healing well, and previous injury experiences (p.389). Although these facilitating factors were described as being present but outside of the athletes’ direct control, one could argue that athletes have some level of choice or control in deciding to utilize those resources in helpful ways.

Tracey (2003) examined emotional responses to injury in a sample of ten injured university student athletes by conducting interviews at three times during the rehabilitation process. The athletes described various coping responses, including seeking social support, taking responsibility for their rehabilitation, and being proactive in their recovery. Being proactive involved learning about the injury and how to support a quick recovery. Tracey also found that the athletes who had recovered from previous injuries utilized their knowledge of what to expect to help them to maintain a positive focus on their current rehabilitation (p. 287).

Quinn and Fallon (1999) examined coping skills in a sample of elite injured athletes. They found the athletes used a variety of coping strategies concurrently and their use of coping strategies was stable over time. In addition, they found the athletes

employed more active coping strategies, such as planning and increasing their efforts, than passive forms of coping, such as denial or emotional venting (p. 225). Carson and Polman (2010) examined the use of avoidance coping in four injured professional rugby players. The injured athletes reported using both cognitive (minimizing or denying the seriousness of the situation) and behavioural (removing self from the threatening situation) avoidance coping strategies. The researchers noted the use of cognitive and behavioural distraction techniques, such as starting a new hobby, focusing on personal and/or career development, and not watching games, were frequently reported as helpful and beneficial for the athletes in managing the situation. Although the purpose of the study was to examine avoidance coping strategies specifically, the injured athletes in this study also reported using other coping strategies, such as instrumental coping and emotional preoccupation.

Accessing social support is another coping strategy used by injured athletes. Emotional and informational forms of social support were helpful in improving rehabilitation experiences in professional football players (Ruddock-Hudson, O'Halloran, & Murphy, 2012). A number of studies including injured student athletes have found social support provided by athletic therapists to be rated as particularly important in enhancing athletes' sense of well-being (Clement & Shannon, 2011) and in increasing athletes' confidence in the efficacy of their rehabilitation programs and ability to return to sport (Bone & Fry, 2006). Indeed, in a study by Yang, Peek-Asa, Lowe, Heiden, and Foster (2010), student athletes' perceived level of social support received from athletic trainers increased after the athletes experienced an injury. Medical staff have also been identified as important sources of support to injured (student) athletes (Tracey, 2003, p. 290).

Research has firmly established that men and women differ in terms of how much they express and disclose emotional states or problems, demonstrating convincingly that women are more likely than men to express emotion (Tamres, Janicki, & Helgeson, 2002, p. 26), hold more positive attitudes about seeking help for mental health concerns (Leong & Zachar, 1999), and engage in more help-seeking behaviours for mental health concerns (Rickwood & Braithwaite, 1994). These differences may influence the types of social support sought and forms of coping used to manage stress. A meta-analysis found that women used more coping strategies than men generally speaking, and in particular, were more likely to seek emotional social support, ruminate,

and make positive reappraisals (Tamres et al., 2002). The researchers characterized these three coping strategies as forms of verbal expression, suggesting that women are more likely to engage in coping behaviours that involve forms verbal expression of emotion. With respect to athletic injury, one study examined help-seeking intentions in university student athletes in which participants were presented with vignettes of different phases of injury rehabilitation and were asked what types of support they would seek in those circumstances (Hoar & Flint, 2008). The researchers found that female athletes held stronger intentions of seeking help from peers compared to male athletes who reported more intentions of seeking help from coaches or athletic therapists. Thus, injured male athletes may be less likely to seek certain forms of social support or to express or disclose emotional difficulties they may be experiencing related to athletic injury.

Based on the findings described above, it is clear that injured athletes employ various strategies as a means of dealing with their injuries and associated stressors. However, individual differences in the use of coping strategies exist and the use of coping strategies is also dependent on context (Brewer, 2007). Albinson and Petrie (2003) examined the relationship between cognitive appraisals, coping strategies, life-event stress, and mood disturbance in a sample of eighteen injured athletes. The results of their correlational analyses suggested that athletes who had experienced more negative life-event stress in the year prior to the injury reported greater perceived difficulty in coping with the injury. They also found the strongest predictor of mood disturbance was life-event stress at day one post injury. The researchers also examined the athletes' cognitive primary appraisals (i.e., appraised stressfulness of the injury) and secondary appraisals (i.e., appraised ability to cope with the injury). Athletes who reported more negative secondary appraisals one day after the injury were more likely to use avoidance coping strategies, such as avoiding the problem or managing emotions through distractions, one week later. Athletes who perceived more stress associated with their injuries and perceived themselves as less able to cope engaged in more active behavioural coping strategies (i.e., active attempts to manage the problem) and fewer active cognitive coping strategies (i.e., active attempts at cognitive reappraisal). Perceived stress levels in injured athletes have also been shown to predict life satisfaction. In a study of injured university athletes, greater levels of perceived life stress predicted lower levels of life satisfaction, and this relationship was more

pronounced in athletes with more severe injuries than those with minor injuries (Malinauskas, 2010).

In summary, research has demonstrated that injured athletes report using a variety of coping strategies while managing their injury and the rehabilitation process. These strategies are often active initiatives on the part of the athletes, in which they engage in strategies with the intent of “doing something” about the situation and are oriented towards solving a problem. Other forms of coping include utilizing social supports, emotion management, and avoidance or distraction. Use of many of these coping strategies led to perceived benefits identified by Wadey et al. (2011), such as disclosing emotions, accessing social support, altering cognitions, and sticking with rehabilitation plans. Thus, coping may play a role in deriving benefits or positive growth from the rehabilitation process. Depending on individual circumstances, such as the number of preceding stressful life events the athlete experienced before the injury and the ways in which the athlete appraises or assesses the stressfulness of the injury and their ability to cope with it, coping strategies employed can vary. For instance, athletes who reported a greater number of stressful life events in the year prior to the injury had more negative appraisals of their ability to cope with the injury and engaged in more active behavioural coping and less active cognitive coping (Albinson & Petrie, 2003). Greater levels of perceived stress in injured athletes can also negatively influence levels of life satisfaction (Malinauskas, 2010). This highlights the need to examine injured athletes’ abilities to manage stressors within the context of their broader lives, and to consider the impact of life stressors on coping with injury, and vice versa. Further, while a number of the studies reviewed above included student-athletes, like the research on stress and coping (in general) in sport, most research on sport injury and rehabilitation has been done in elite athlete populations and comparatively few have examined the student-athlete specifically. Ruddock-Hudson et al. (2012) also noted that the generalizability of research findings in this area has been limited by variation in the competitive levels sampled within relevant studies (p. 376).

## **Current Study**

The principle goal of the current study is to gain a better understanding of how university student athletes manage stressors associated with sport injury and rehabilitation within the context of their day-to-day lives—lives that contain many other

demands and challenges. As reviewed above, a good deal of research has been conducted with a focus on understanding the psychological responses associated with athletic injury and coping strategies employed by injured athletes. Although student athletes have been included in previous research aimed at examining psychological responses and coping, this population has been less studied within the area of injury research (Malinauskas, 2010). Others have argued for the importance of considering specific contexts in studying responses to adversity (Roy-Davis et al., 2017). Few previous studies have explicitly reported on the unique experience of the injured student athlete, and previous studies have not examined coping with sport injury within the context of managing day-to-day stressors and the demands associated with a university education and broader life circumstances. Thus, the current study aimed to contribute to the existing research by: a) exploring the experiences of the injured *student* athlete specifically and b) conducting this exploration within the context of the student athletes' day-to-day lives.

The current study explored the experiences of injured student athletes using a qualitative methodology. The injured student athletes in this study were asked to describe their perceptions of their stressors related to life in general and stressors related specifically to their sport injury. In addition, they were asked to describe their perceptions of how these stressors were managed and the effects of the stressors. For the purposes of this study, coping was defined as any efforts, proactive or reactive, aimed at eliminating or reducing a source of stress or the effects of the stressor. The purpose of this study was not to test predicted relationships, but rather to gain a more thorough understanding of the participants' experiences and perceptions. A weekly journal method was employed, which allowed the researcher to gather near real-time information from the injured student athletes about their experiences and perceptions of managing their day-to-day stressors and their injury rehabilitation. Litt, Tennon, and Affleck (2011) argued that many measures of coping in research treat coping as a trait construct, and while this can be useful in some regards, examining coping in this way, "...offers little information as to what a person will actually *do* during a specific stressful encounter" (p. 391). The weekly journal used in this study helps to mitigate this concern as the participants were asked to reflect on and describe their actual responses to stressors close to the times at which they occurred. Lazarus (1999) has argued that longitudinal designs are best suited for research on the coping process and stated, "to

study the coping process requires that we describe what the person is thinking and doing at each stage, and the context in which it occurs” (p. 113). The weekly journal method allowed for an examination of the coping process over the course of many weeks and within and between-person comparisons of coping responses and process.

It has been suggested more research is needed within sport psychology with a focus on exploring how athletes’ abilities and efforts to manage challenges may influence their personal and athletic development (Galli & Vealey, 2008). Participants in this study also completed a semi-structured interview after returning to sport, in order to gather information about their perceptions of how the injury and the rehabilitation process affected them. The interview was used to more thoroughly explore themes that arose in the journal entries.

# Methods

## Approach to Inquiry

As stated above, this study employed a qualitative methodology. More specifically, the method used is, as Rennie (2012) described, “experiential... involves the conceptualization of meanings of experiences whether reported by participants or inferred through participant observation” (p. 385). Qualitative methods are well suited to the exploration of personal experiences within a more natural context (Tutty, Rothery, & Grinell, 1996). Constructivism and social constructivist paradigms hold that people and social groups interpret their experiences and construct knowledge about their own realities, and these constructions have implications for their actions and social interactions (Patton, 2002). The goals of this study aligned with these philosophical orientations, as the methods endeavored to illuminate and understand how participants construct and attribute meaning to their experiences as injured student athletes.

It is also vital to understand an individual’s context and culture in order to understand his or her constructed meanings (Morrow, 2005). The current study aimed to explore the contexts within which the participants experienced their stressors by studying their experiences within both the student-athlete role and their broader life context. It is also necessary to take into account the particular culture within which the student athlete exists, and while elements of the participants’ culture were evident through the journal entries, the cultural component was explored more deeply during the interviews. Morrow (2005) stated, “without adequate integration of data sources, a thorough understanding of the context and culture, and a high-quality relationship with the participants, the final interpretation of the evidence may be in doubt” (p. 256). This study integrated two data sources, with particular attention given to context. The use of more than one source of data in qualitative studies is often referred to as triangulation, and can be described as “...a way of opening up different facets of complex phenomena to view” (Henwood & Pidgeon, 2006, p. 363).

## Researcher's Background

The influence of subjectivities and biases cannot be completely eliminated in any form of research. Researchers can, and should, reflect upon how their own experiences may influence their relationship with a research project, participants, and data, and sharing these reflections may help to enhance transparency. According to a recent report by the American Psychological Association Publications and Communications Board Working Group on Qualitative Research (Levitt et al., 2018), integrity in research methods can be improved with perspective management practices, through which the researcher maintains an awareness of and is transparent about his or her perspectives and the ways in which those perspectives may have influenced research processes and data analysis (p. 33). Morrow (2005) suggests including a "Researcher-as-instrument statement" (p. 259) within the Methods section of qualitative studies, in which the researcher describes his or her experiences with the population under investigation and/or topic, offers descriptions of biases, assumptions, and subjectivities, and discusses how these issues were managed throughout and/or affected the research process. To this end, a brief description of the investigator's background in relation to the topic of this study is provided next. In addition, strategies and safeguards that were used to enhance the trustworthiness and quality of the study are described in detail throughout the Methods section.

I, the investigator, share many similarities with the participants in this study. As a senior graduate student in clinical psychology, I have spent the majority of my adult life as a student. Near the end of this study, I also began working as an undergraduate instructor in psychology, taking on my own dual role as student and teacher. Like my participants, I also have a physical injury. In 2015, a few years after I began this research, I developed a repetitive strain injury in my right leg. This occurred while training for my fourth half marathon. I completed that half marathon, achieved a personal best and was ranked relatively high overall; an unexpected outcome. I have not run more than seven kilometres since. While I was not a high level competitive athlete, I did identify as a runner, and as one that was continually improving. After doing well in that last race, I began planning how I could continue to improve, and envisioned becoming even faster for my next race. Instead, the effects of my injury took hold and forced me to stop distance running shortly after this half marathon. I have sought physiotherapy and

massage therapy, and made major adjustments to my physical activity regime. Although I can occasionally jog short distances without aggravating the injury, I have had to come to terms with the loss of this element of my identity, as I no longer feel that I can self-identify as a “runner.”

My background highlights a number of similarities between myself and my participants. As the participants in this study were also students, I had to be mindful that while I could easily relate with many of their experiences regarding academic demands, I needed to ensure that I continually attempted to take their perspectives and understand their personal experiences. In fact, this process may be especially important because I have been a student for so long. I may find it very easy to assume I understand what others' lives as students are like. As a student and a teacher, it was vital that I reflected on my own experiences and challenges associated with balancing the demands of multiple roles to ensure that my personal experiences did not bias my interpretations of their experiences. In terms of my physical injury, my rehabilitation process has not been nearly as demanding as the processes described by the athletes in this study, nor was I performing at anywhere near the same level of athletic accomplishment. In addition, running was more a means of maintaining fitness to me than a sport, and I have adapted my physical activity regime to meet that goal without running. I think these differences helped me to view their experiences as distinct from my own, and provided me with a degree of separation in that regard. While I could relate to some of their experiences, I did not find myself imposing my own rehabilitation experiences onto theirs. Thus, while I have multiple important similarities with these participants, my circumstances are different enough that a balance was struck; that is, my ability to relate to their circumstances likely aided my understanding of their experiences, but the differences created enough separation which allowed me to maintain a curious and open-minded stance.

## **Participants**

Ethical approval for this study was obtained through the Office of Research Ethics at Simon Fraser University (SFU) and by the research ethics boards of universities from which participants were recruited. Participants were student volunteers recruited from university athletic rehabilitation clinics. Participants were full-time

undergraduate students and current varsity athletes. Other participant inclusion criteria included:

- a) English speaking,
- b) Recently experienced a physical injury which prevented full participation in sport for at least four weeks upon initial physical assessment, and
- c) Had not suffered a recent concussion.

The population from which the sample was drawn was heterogeneous in terms of gender and sport played. Contact information and details of the study were provided to the athletic department physical rehabilitation team members. Injured student athletes were given information about the study by a physiotherapist or another member of the rehabilitation team and asked to contact the investigator if they were interested in volunteering for the study. The researcher or research assistant met with each participant individually; participants were advised of the nature and purpose of the study and asked to provide informed consent to participate. Participants were also asked for their permission to use non-identifiable direct quotes from their weekly journal and/or interview data as exemplars to be used in describing the results of the study. A copy of the weekly journal was reviewed during this meeting and participants were given the opportunity to ask any questions they may have had about the nature of the journal entries.

In total, nine participants were recruited to participate in this study. Five participants completed all phases of data collection. The other four participants partially completed the weekly journal entries. Reminder emails were sent to participants when a weekly journal entry was not provided as scheduled. No reasons for withdrawal from the study were provided, and no further attempts were made to contact these individuals.

## **Demographics Questionnaire**

Participants completed a general demographics questionnaire designed by the researcher to gather descriptive information about each participant, including age, gender, sport played, number of years of education, program of study, and nature of injury. This questionnaire was completed during the initial meeting with each participant.

## **Weekly Journals**

Participants completed journal entries for 14 consecutive weeks. Instructions for completing the weekly journal were reviewed prior to beginning the study, and each participant was given the opportunity to ask questions about the nature of the journal and how to complete it. The weekly journal data was gathered via SFU Psychology Surveys (<https://survey.psyc.sfu.ca>). This is a secure survey system used for research purposes by members of the Department of Psychology at SFU. Each participant was sent a weekly email that included a case sensitive email link that allowed secure access to the survey. Participants were advised that they could print a copy of their own completed weekly journal entries to keep if they desired. One participant did not have internet access during the timeframe that he completed the journal entries. He was provided hard-copy versions of each set of weekly journal questions and completed the journal entries by hand. He was also provided stamped and addressed (to the researcher at SFU's Department of Psychology) envelopes to submit his journal entries via mail.

Participants completed the same journal each week; the questions did not change over the course of the study, but during weeks 4, 8, 12 and 14, participants were asked to respond to two additional questions. The journal template and questions (see Appendix A) were developed with the specific intent of exploring student athletes' experiences, perceptions, and understanding of their stressors and how they are managed. The journal questions were constructed in a semi-structured manner in which participants had the freedom to answer questions openly and to use their own words to describe their experiences. The questions were designed to inquire into participants' experiences in managing daily stressors, demands, and challenges related to not only their injury and rehabilitation, but also other areas of their lives (such as academics, social life, employment, etc.). The questions inquired about perceived effects of stressors, proactive and reactive coping efforts, and the extent to which the stressors affected or interfered with the participants' daily functioning or caused any distress.

## **Semi-structured Interviews**

After completing the weekly journal portion of the study, the participants completed a semi-structured interview with the researcher. The interviews took place

anywhere from three to fifteen months after the participants completed the journal portion of the study. The time between completion of the journal entries and the interview varied for multiple reasons, such as participants being out of town and delays in returning to sport. The purpose of the interview was to gather more in-depth information about the process of managing injury rehabilitation within the context of the participants' lives as student athletes, and to explore whether the participants perceived any personal and/or athletic development as a result of their experiences. An interview guide (see Appendix B) developed by the researcher included an introduction to the interview, provided further information about the purpose and nature of the interview, allowed participants to ask any questions before proceeding, and included some initial interview questions that were asked of all participants. Other interview questions were developed after an initial review of each participant's journal entries, as the nature of the data and the themes derived from the journals illuminated areas in need of further exploration.

Three interviews were completed via Skype-to-Skype calls due to geographical limitations, and the other two interviews were completed in-person. Interview length ranged from 29 to 67 minutes (mean 50 minutes). All interviews were audio-recorded using computer software. The researcher transcribed all interviews verbatim. This involved listening to the interviews and transcribing the data into a word processing program. This process allowed the investigator to become more familiar with the content of each interview and think critically about the data during earlier phases of the research (Tutty et al., 1996).

## **Data analysis**

The journal and interview data were analyzed using grounded theory methodology as described by Charmaz (2014). According to Charmaz, the data are coded in stages. The first stage of coding, initial coding, involves categorizing of the raw data. A short label for a segment of text that summarizes the content of the text is developed. Charmaz recommended moving through this process quickly, making comparisons among segments of data, and keeping the codes short and concise with a focus on preserving actions (p. 120). She described three levels of initial coding: word by word, line by line, and incident by incident. In this study, initial coding was done close to line by line, but due to the format of the journal entries, incident by incident coding was

sometimes more appropriate. The second stage of coding, focused coding, involves determining which initial codes seem to be the most significant or appear the most frequently throughout the data (Charmaz, 2014). In this phase, initial codes that are less relevant may be discarded, while those that are most relevant are maintained or perhaps renamed. This process occurs by continually comparing the data to itself and making decisions about which codes make the most conceptual and analytical sense and best organize and synthesize large amounts of data (Charmaz). Through this process, codes that have the potential to become categories begin to emerge, and the overall structure and framework of the data take form.

According to Charmaz, themes and categories are developed and further refined by continually comparing the data to itself in a flexible manner throughout the coding stages. In later stages of coding, theoretical categories are developed and potential relationships between categories are explored. Memo writing, used as a tool to process codes and theoretical categories as they emerge, can be done at any point during the research process, and creates a record of the analysis (Charmaz). The memos allow the researcher to write about ideas, considerations, plans for the continued analysis, and provide the researcher with a means to consider emerging theoretical developments and conceptualizations (Henwood & Pidgeon, 2006). Theoretical sampling follows the development of theoretical categories, which involves the purposeful collection of data to “fill out” incomplete categories. This may involve the collection of new data or reanalysis of existing data, and can also be used to elucidate relationships between categories (Charmaz, 2014).

Phases of data analysis in this study were not linear for two reasons. First, data collection occurred over the course of thirty-four months. Recruitment was ongoing, and as such participants completed the journal entries and interviews at varying times throughout the data collection phase. Some analyses, including coding, category and theme development, and memo-writing took place throughout the data collection phase with the journal and interview data that were available. Interviews were used to collect additional participant data but were also used to carry out theoretical sampling and further explore themes or conceptualizations derived from earlier analyses. Second, according to Charmaz (2014), this form of data analysis is an iterative process; although the coding and categorization phases are presented in a linear fashion, as the analysis process progresses the researcher is free to move back and forth between phases of

analysis flexibly, critically analyzing, exploring and “filling-out” categories and relationships between categories. New codes and categories may be developed, or previous codes and categories may be adjusted or adapted as analyses progress. As stated earlier, one form of theoretical sampling involves going back to previously analyzed data and re-examining the data within the context of newly developed categories or to explore potential relationships between categories that had not yet emerged. Given the large amount of data collected in this study, despite the small sample size, this type of theoretical sampling was used extensively.

According to Morrow (2005), all forms of research must grapple with researcher subjectivity and bias. From a constructivist perspective, the researcher is accepted as a “...co-creator of meaning, as integral to the interpretation of data...” (p. 254). However, Morrow recommends the qualitative researcher make known plans for managing researcher subjectivity. In this study, the researcher remained vigilant throughout the analysis process to the impact her subjectivity and biases may have had on her interpretation of the data (Morrow, 2007). This involved reflecting on personal reactions, assumptions, and interpretations, and attempting to take the participants’ perspective throughout the data collection, analysis, and writing processes.

A number of specific strategies were implemented in order to ensure that standards of research quality were met in the current study. During the interviews, the researcher attempted to ensure that participants’ meanings were carefully considered by asking for clarification or for a more thorough description of the participants’ responses (Morrow, 2005). In order to protect the accuracy of the data and participants’ intended meanings, the researcher was careful to stay close to the participants’ words and interpretations while coding and developing themes. This involved the use of “in vivo” coding, which utilizes the participants’ words and phrases in the development of codes or themes (Charmaz, 2014, p. 133). Participants were asked to review summaries of the analyzed journal data and interview transcripts for accuracy. This type of collaboration with participants can help to ensure accuracy (Yeh & Inman, 2007) while demonstrating to the participants that their input is valuable and important. Two of the five participants completed the review of their summaries; the other three did not respond to this request for unknown reasons. Neither of those two participants provided corrections to their summaries, suggesting the summaries reflected their experiences well. In addition, a log of activities and phases of data collection, analysis, and participant interactions was

maintained. Finally, a research assistant was employed as a co-analyst. The research assistant and researcher co-conducted initial coding, focused coding, categorical analyses, and theoretical sampling. Any discrepancies that arose in interpretations were discussed and resolved as best as possible. These last two strategies help to ensure transparency in the data collection and analysis phases (Fossey, Harvey, McDermott, & Davidson, 2002).

One particularly important issue related to ensuring the standards of research quality using qualitative methods is that of data sufficiency. A related concept is data saturation or theoretical saturation, that is, the point in which further data analysis no longer yields new information about or properties of theoretical categories (Charmaz, 2014, p. 213). However, determining this cut-off point is not necessarily straightforward, and Charmaz has noted that definitions of theoretical saturation and strategies used to determine saturation vary between researchers. Dey (1999, as cited in Charmaz, 2014, p. 215) argued that theoretical sufficiency is a more appropriate target. Under this definition, categories are *suggested* by the data. This more tentative cut-off point resonates well with those who argue that achieving complete saturation is unrealistic and perhaps unattainable and rather, recommends an openness to the possibility that the phenomenon may not be completely described or understood by the data collected in that particular study. The current study employed this definition of theoretical sufficiency. The low sample size makes it difficult to draw definitive conclusions about the topic under study, and it would be inappropriate to argue that the themes and categories described next are exhaustive. However, it is not necessary to know everything to know some things that are worth knowing. Based on a very thorough analysis, including theoretical sampling and carefully defining and explaining variations in categories (Charmaz, 2014), it was determined that the themes and categories that emerged from this analysis are sufficiently suggested by the data.

More specifically, it became evident to my research assistant and I that important themes were emerging during the early coding phases, as similar phrases and experiences were identified within and between datasets. As described above, the analysis procedure involved going back and forth between the data and codes that were developing throughout initial and focused coding phases, and comparing segments of data and codes to identify similarities, differences, and relationships. During our early analyses, we regularly discussed themes as they arose, comparing and contrasting data

from each participant, and wrote memos regarding potential “leads” to follow during coding. As our analyses continued, the emergent themes and sub-themes were “filled out,” from which we developed categories and sub-categories. Later, the process of theoretical sampling continued, during which time I went through the results, explored processes and relationships amongst the data, and re-organized and redefined the categories. Given the large amount of data yielded from the 14 weeks of journal entries and interview transcripts from the participants, this process was lengthy and intensive. In the end, a few codes remained that did not fit neatly into the emergent model. These codes may be related to specific participant personality traits or idiosyncrasies, but the remaining codes combined with the small sample size suggest that a complete level of data saturation was not achieved. I would argue, however, that the results are sufficiently suggested, both in breadth and depth. In terms of breadth, the reader will note a wide range of experiences described by the participants in the results that follow. In terms of depth, although not every participant endorsed every theme or category, each category described in the results contained multiple codes, suggesting each has a level of relevance or importance. Thus, while I cannot claim to have captured an exhaustive or saturated account of the stress and coping experiences of injured student athletes, the categories that emerged are varied, substantive, and indicative of the injury-related experiences of many student athletes.

# Results

## Descriptive Demographics

A total of nine participants were recruited. Five participants (three female and two male) completed all data collection components of this study. The other four participants completed varying amounts of the journal entries (ranging from one to six weeks) and then discontinued participation; only complete datasets were included in data analysis (N = 5). At the time of recruitment, the five participants (hereafter referred to as 'athletes') ranged in age from 20 to 23 years and all were undergraduate student athletes at local universities. Four of the athletes were fourth-year students, and one was a second-year student. Four students were pursuing Bachelor of Science degrees and one was pursuing a degree in Economics. The sports represented included softball, football, lacrosse, wrestling, and soccer. The nature of each athlete's injury and rehabilitation time varied. Injuries included knee injuries (anterior cruciate ligament (ACL) and meniscus tears), a shoulder injury, and a herniated disc. Two athletes were rehabilitating from multiple injuries (and surgeries) over the course of their participation, one of whom suffered an additional non-athletic neck injury while rehabilitating from an athletic injury. Two athletes were rehabilitating from a single injury and subsequent surgery. One athlete was rehabilitating from an injury that did not require surgery. At the time of recruitment, each athlete provided an estimated time to return to sport. These estimated rehabilitation timelines ranged from two to nine months. Each athlete had returned to sport by the time he/she completed the interview portion of the study.

The four athletes who did not provide complete datasets ranged in age from 18 to 21 years. All were female. Two were first-year students and two had completed three years of study. The programs of study included degrees in Arts, Business, Science, and Education. The sports represented included wrestling, basketball, and volleyball. Three of these athletes reported having suffered an ACL or other knee injury with expected recovery times ranging from 9 to 18 months. The fourth athlete reported having suffered an ankle sprain with an expected recovery time of four to five weeks. These four participants provided weekly journal entries of varying lengths and did not complete interviews upon returning to sport. The data yielded from their participation were coded but not included in the completed analyses.

The following sections describe the results of analysis of the five complete datasets. The results have been organized into overarching categories and subcategories. Within each section, non-identifiable quotations have been used as examples. The results provide a summary of the themes and categories most commonly described by the athletes, but it should be noted that not every athlete endorsed each theme or category.

## **Life as a Student Athlete**

Life as a student athlete and as part of a team was associated with distinctive social experiences. The team was described as being like “*family*,” and an important source of support because of teammates’ shared experiences and understanding of what life is like as a student athlete. Teams provided a pre-established social group of “*like-minded*” individuals, within which strong relationships form amongst teammates. Although one participant noted other people may have stereotypical beliefs about athletes (e.g., the “*jock*” stigma), he also believed being a student athlete commands a certain level of respect because student athletes have to complete heavy coursework like other students plus maintain sport involvement, and being a student athlete means having a more “*well-rounded*” university experience. Overall, being a student athlete was an important part of the athletes’ sense of identity.

**Sources of stress.** The nature of the stressors identified by the athletes throughout their participation in this study varied depending on individual circumstances. Journal entries completed during the school term referred to more school-related stressors compared to the stressors identified in journal entries that were completed during the summer. In addition, throughout the journal entries there were some weeks when the athletes reported no major stressors. Consistently, however, managing time demands and balancing roles were identified as the biggest challenges and stressors facing student athletes. Balancing time demands of a student athlete was aptly described by one athlete as “*rigorous*.” The athletes needed to maintain and balance the demands of multiple roles including sport (attending games and practices, travel for competition, and exercising), school, family, employment/volunteer work, relationships, and health. As one athlete described,

*“...I know that I can’t dilly-dally with my time unnecessarily because I do have to have such a strict schedule.”*

More specifically, school-related stressors included completing assignments and studying, managing the school workload, receiving poor grades, exams and end-of-term demands, and difficulties maintaining focus in class and when studying. While these stressors are likely common to all university students, student athletes must meet these demands while balancing sport demands. For example, studying may need to be completed while travelling (e.g., on the bus) for competition, or assignments may need to be completed well in advance to avoid doing homework while travelling for sport. In some cases, there was added pressure associated with maintaining good grades because academic performance affected eligibility to play. Conflict with or worries about the well-being of family members or significant others were also cited as sources of stress. The athletes also described stress associated with employment/work tasks, dealing with illness, and making important decisions in other domains of life.

***Minor stressors and challenges.*** As described earlier (in the Methods section), the questions that guided the journal entries asked the athletes to describe any stressful situations, stressors, or challenges and how they coped with those circumstances or events. In some cases, the athletes differentiated stressful situations from more minor stressors or challenges. Hassles such as being stuck in traffic or missing a medical appointment were sometimes differentiated from major stressors. Sometimes schoolwork was described as being a smaller stressor, but became a larger stressor near or during exams or when multiple assignments were due. Further, stressors were not always described as negative experiences. Two examples are provided,

*“This week I haven’t really encountered situations that are really stressful, only minor situations that you could classify as stress but they don’t give me anxiety or really affect my day.”*

*“With time each stressor is looked at as an obstacle that I have to overcome to get to my end goal and get better.”*

In summary, the student athlete lifestyle is a challenging one to balance. Not only do student athletes have multiple roles and associated stressors to manage, the time demands associated with their sport and student roles are intensive. Although they

reported multiple sources of stress in their lives, not all stressors were viewed as negative or as major issues.

## **Life as an Injured Student Athlete**

As described above, balancing the demands and time commitments of their multiple roles was identified as the most challenging aspect of being a student athlete. For the athletes in this study, injury rehabilitation activities, such as attending physiotherapy/medical appointments and doing rehabilitation exercises, placed additional strain and demands on their time. Although the athletes were unable to participate fully in their sports while injured, rehabilitation demands did not always replace sport demands; some of the participants noted that they had to maintain their sport involvement (e.g., attending practices) as much as possible while rehabilitating. For example, one athlete described the added demands of injury rehabilitation,

*“... being an injured student athlete, it’s even harder because... you could say is kind of like another job in the sense that to be the most effective you have to do it all the time, like literally every day... if you don’t do it every day it’s not effective, and so that is a huge demand.”*

However, being a student athlete also had its perks during rehabilitation. For instance, the student athletes in this study reported having convenient access to a physiotherapy clinic on campus. In addition, the sport/team culture was viewed by most of the athletes as supportive and a source of motivation during injury rehabilitation. For example,

*“It’s (being a part of a team) a consistent driving force behind coming back to the sport because you are a part of a larger group of people, I guess teammates or coaches, other people that rely on you because you are a piece of a puzzle.”*

Although having access to the school/team physiotherapy services was convenient, for athletes rehabilitating over the summer months (during which time they were not on campus regularly or had moved home for the summer) a number of challenges were described related to attending physiotherapy appointments. For example, trips to appointments could be long, costly, or inconvenient. Some athletes noted they found it difficult to engage in rehabilitation exercises when not at the

physiotherapy clinic, and one athlete described missing his physiotherapist's "expert eye." Rehabilitating over the summer months also meant receiving less direct support from the team, but also lessened the demands placed on the athlete; one athlete said she was glad her rehabilitation took place primarily over the summer months, as she thought it would have been more difficult to manage her rehabilitation while taking classes.

### **Psychological responses or effects of the injury and rehabilitation process.**

The injury and rehabilitation process affected the athletes in negative ways at times, and significantly impacted multiple areas of life. For example, one athlete, whose rehabilitation of multiple injuries and surgeries spanned over a year, became "sick and tired of rehabbing." In her case, her non-athletic neck injury became aggravated when she worked on rehabilitating her other injuries, and the neck injury delayed rehabilitation of her other injuries. Symptoms associated with her neck injury, such as headaches and difficulties with thinking clearly, significantly affected her daily life and interfered with her ability to do schoolwork. For another athlete, the effects of the injury led to major life changes. He decided to return to his home province for his surgery and rehabilitation, take a semester off school to rehabilitate, and then return to his sport and studies at a different university. Another athlete described the injury experience as traumatic. In her words,

*"...going through such a traumatic thing... I wasn't in the best mind because it was, like, super upsetting for me to be in my junior year, possibly having a career ending injury... The surgery, I wasn't worried about at all... but it was the recovery that was kind of trying at times... dealing with all these little stressors, and it wasn't just one or two little stressors, it was multiple coming at me..."*

Negative emotional reactions to the injury and to the effects of the injury, such as frustration, fears and worries, and negative mood, were commonly described by the athletes. Feelings of frustration resulted from their physical limitations, pain, inability to participate in sport, and rehabilitation setbacks. Fear, nervousness, and worries about surgery, re-injury or aggravating the injury were described. Some athletes also described worries that they might not be able to return to sport, the potential of losing a starting position, or missing important training opportunities and how that might impact sport performance. Other negative emotional responses included feeling drained and more

irritable. More extreme negative emotional responses were also described; one athlete said she found herself in a state of “*victim mentality*” during the injury rehabilitation process, which she described as cycles of feeling sorry for herself, negativity, and reductions in motivation. She said this mentality resulted from focusing on the negative aspects of her experiences and impacted her ability to cope, and, when at its worst, she worried she may have a mental health issue. In her words,

*“And I think being injured and dealing with so many things, you know, just life problems, that I think it kind of weakened my mental immune system to actually deal with other things like, you know, sensitivity and stuff. So, it was hard not to be sensitive and to not get down...”*

A number of unproductive thought processes/negative forms of self-talk were identified by the athletes such as ruminating on negative aspects of their experiences, over-thinking/analyzing, and perfectionism. For example, one athlete referred to her tendency to over-think situations instead of taking action (i.e., thinking instead of doing) as “*fixating*.” To her, this type of thought process was associated with negative emotions and reductions in motivation.

Appearing weak or different as a result of limited mobility or loss of strength was associated with feelings of embarrassment, stress, and frustration. For example, one athlete described feeling self-conscious when she exercised at a lesser intensity in the gym and worried that others might think she was lazy. She also found it frustrating to have to explain to others why she still had physical limitations even though her “*scars had healed*” (i.e., her injury was no longer visible). Another athlete did not want the physical limits associated with his injury to be evident during his physically-demanding summer work placement. In other cases, the injury negatively impacted sleep and physical comfort, and one athlete commented on the loss of the ability to use a preferred stress-relieving strategy – physical activity. For another, focusing heavily on rehabilitation at the expense of her studies negatively impacted her school performance.

A loss of confidence in one’s physical abilities, a loss of independence, and feeling “useless” or a burden to others was also described, particularly in circumstances in which the athlete was recovering from surgery and when mobility was the most limited. The injury and rehabilitation led to other losses, such as loss of summer

employment, mobility, social support (e.g., when rehabilitating away from the team over summer), and strength/muscle tone. Thus, the injury and rehabilitation process negatively impacted the athletes' physical, mental, and emotional states in significant and varied ways.

**Fear of re-injury.** The prospect of returning to sport involved mixed emotions; specifically, excitement coupled with the fear of re-injury. All the athletes described becoming aware of the potential for re-injury during rehabilitation, and most expressed some fear that re-injury could occur. For example, one athlete described the excitement of returning to sport and the fear of re-injury,

*"... I'm beginning to get nervous about being hurt again. This was my first injury and it seemed so easy to get hurt but such a long process to recover."*

Engaging in certain activities for the first time was associated with fear of re-injury for some, and some described an awareness that pushing oneself too hard physically could increase risk of re-injury. One athlete described being particularly cautious to avoid aggravating the injury:

*"Still, I wish I could have stopped myself from hurting myself. My injury has taken a big chunk of time and energy to deal with and getting back to where I was will be a long road. I've spent a good portion of my summer being paranoid and cautious."*

Although the fear was present, the athletes continued to participate in their daily lives with the awareness that re-injury could occur. For example,

*"It is slightly stressful because I can't control other people walking [into me], and there's always a chance of them hitting me or hurting me... It scared me and hurt but I can't live in fear that I'm going to hurt myself."*

**Sources of stress.** Each athlete was asked to identify the biggest challenge he or she faced over the injury rehabilitation process. The challenges identified included how long rehabilitation took, being patient with and pacing oneself (i.e., not pushing oneself too hard too soon), observing the team practice and play but not being able to participate, acceptance of the injury, which meant not being able to play, and managing time demands. Throughout the study, the athletes described a number of stressors associated specifically with their injuries and the rehabilitation process. These stressors

included pain, daily hassles related to recovery (e.g., not being able to drive or easily complete some daily living activities), physical limitations/limited mobility, lack of sleep, fatigue, travelling with an injury, additional time demands as a result of medical appointments, worrying about losing a starting position on the team, inability to participate in sport-related activities, and dealing with rehabilitation setbacks. For those whose injury/rehabilitation prevented them from being able to maintain employment, there was also stress related to lack of employment and financial strain.

***Uncertainty and lack of information.*** Uncertainty and lack of information about one's rehabilitation timeline, what to expect post-surgery, the long-term impact of the injury, and waiting for medical test results were specific sources of stress for many of the athletes in this study. For example, one athlete described feeling unprepared to cope with the post-surgery challenges, the length of recovery time, and the degree of her limitations. She said being given more information prior to surgery would have been very helpful and would have lessened the shock of the extent of her post-surgery state and limitations. She commented,

*"... going into surgery I wasn't prepared for how long of a recovery this was going to be. Nobody told me that... you won't be able to run for six months, or you won't be able to participate in anything with your team in fall training. Like I felt like I was very kind of blind to the restrictions that I'll have later on."*

Some of the athletes reported reductions in their levels of stress when they had information that improved their knowledge of what to expect in terms of recovery timelines and the effects of the injury/surgery. This was accomplished by having realistic conversations with health care providers, being provided information on recovery timelines, and, for those who had suffered prior injuries, knowledge from previous experiences. Learning about recovery timelines and knowing the next steps in the rehabilitation process helped the athletes to set goals, plan, and develop a sense of what elements of rehabilitation were under their control, thereby reducing stress and uncertainty about the process. For example, the previous injuries, surgeries, and recoveries one athlete had endured at an earlier age increased his awareness of the injury process and what to expect during rehabilitation. He described this awareness as helpful in making his current rehabilitation process less challenging, and he felt better equipped to deal with subsequent surgeries. In his words,

“...it’s kind of different every time you get hurt but I knew how I had to approach it... nothing was extremely challenging because I knew what I had to do in order to come back healthy.”

**Sources of motivation during rehabilitation.** The athletes in this study referenced multiple sources of motivation that helped push them to rehabilitate and return to sport. These sources of motivation are mentioned throughout the results and are summarized in Table 1.

**Table 1. Sources of Motivation**  
*Table 1*

Encouragement from teammates
Observing teammates practice or compete
Learning about others who had successfully recovered from injury
“Prove them wrong” – responses to negative or critical views on the athletes’ injuries or ability to rehabilitate
Goal-setting
Making rehabilitation progress
Being productive
Improvements in weather – increased motivation for outdoor sport and activity

**Meaning of sport.** Over the course of rehabilitation, some athletes described coming to realize how much they loved their sport and that they missed playing more than they expected. For others, however, their attachment to their sport became weaker. One athlete described how his identity shifted as a result of his injuries and broadened to include more roles beyond being just a student athlete. He argued that injuries are less threatening when a person has more components to his or her identity. Another athlete described becoming less “*emotionally attached*” to his sport and team over time, and how he realized recovery from his injury was important for more reasons than just to return to sport; if he did not recover physically, his ability to work in his career of choice could have been jeopardized.

## **Coping Strategies**

The athletes in this study utilized many different coping strategies. The preferred or most commonly used strategies varied from athlete to athlete; however, there were common themes amongst the strategies described. One of the aims of this study was to gain a better understanding of how injured student athletes cope with stressors

associated with injury rehabilitation within the context of daily life. Overall, many coping strategies reported were applied to both injury/rehabilitation-related stressors and other life stressors; there were fewer coping strategies that were applied solely to one domain of life. For instance, physical rehabilitation coping strategies were primarily used to cope specifically with physical elements and consequences of the injuries (e.g., reduce swelling, promote healing, preventing pain). However, using strategies to cope specifically with the physical injury and participating in physical rehabilitation were often associated with reduction in stress or improvements in other areas of life. For example:

*“I’ve been working on making yoga and stretching a regular thing each day; I found I’ve been more relaxed and less tense overall (muscles included).”*

## **Physical coping strategies**

Coping with the injury involved the application of physical or medically-oriented practices or strategies to manage pain, reduce swelling, and aid physical recovery. These strategies included applying heat or ice, taking medication, massage, resting/taking breaks, e-stimulation, wearing a brace, stretching, strengthening, attending physiotherapy, and other exercises. For one athlete, meditation and yoga were identified as particularly important strategies in his recovery. Some athletes also modified their activities (e.g., taking the elevator, standing instead of sitting in class, changing sleep position, wearing comfortable and sturdy shoes) to avoid pain/discomfort associated with the injury.

**Finding alternatives.** Many of the athletes needed to find alternative ways of exercising or carrying out activities of daily living as a result of their injuries. For instance, one athlete described how she developed alternative ways of doing many activities following surgery, including cooking food, getting around the house, and self-care. She described her efforts at coping with her limited mobility as developing “*creative*” and “*smart*” alternatives. She adapted activities instead of avoiding them, and cautiously made adjustments to how she functioned. In her words,

*“I got creative when carrying things into other rooms when needed... Just by carrying or moving these things in nonconventional ways I could find other ways of doing things instead of getting frustrated with what I can’t do.”*

Many of the athletes also described an inability to work-out in their usual manner, and instead did alternative or modified exercises or used equipment that was available at home if they were unable to access the gym or physiotherapy clinic. For example, when describing stressful situations from the past week in a journal entry, one athlete commented on the frustration associated with not being able to do regular exercises. She said,

*“Challenge trying to climb ropes, was frustrated my knee wasn’t strong enough. Managed by doing alternative exercises.”*

Some athletes were required to find alternative employment or sources of income (e.g., scholarships) as their injuries prevented them from working in their usual jobs. One athlete learned to write with his non-injured, non-dominant hand. Thus, finding alternative ways of doing things helped to reduce feelings of frustration or stress, allowing the athletes to continue to function, exercise, and complete important tasks.

## **Planning and scheduling**

The athletes described ways in which they coped with their various roles and associated demands. Developing a balance among roles was accomplished by staying organized, planning ahead, maintaining a schedule and routine, and prioritizing and limiting tasks and commitments, such as reducing school course load. Some also ensured they set aside specified time to spend on themselves (e.g., “me time”) or to relax, as well as scheduling in specific time for rehabilitation and exercise. Many of these strategies were proactive in nature and involved being efficient with time-management. However, the demands of the multiple roles were not always fully balanced, and sometimes some demands were prioritized at the expense of others.

## **Goal-setting, being productive, and making progress**

Most of the athletes explicitly described their use of goals within the context of injury rehabilitation and in daily life and academics. The act of setting goals was described as a helpful and motivating practice in and of itself, and maintaining an awareness of one’s goals also helped to increase and sustain motivation over time and manage stress. For example, one athlete said,

*“Setting goals for wrestling next season and keeping them in mind has greatly helped with managing stress and staying motivated.”*

One athlete reflected on the ups and downs she experienced over the course of her injury rehabilitation, and commented on how important it was to her to increase her use of goal-setting:

*“When I am in a routine and actively writing goals down I accomplish a lot more. But when I am not, it is so easy to become unmotivated and lazy... I need to make a conscious effort to goal set and write them down...”*

Applying realistic goal setting strategies and achieving goals was associated with an increased sense of confidence, positive mood, and feelings of accomplishment, productivity, and fulfillment. Being productive, which implies making progress towards goals, was important in helping the athletes to feel accomplished, satisfied, and more relaxed. Becoming task-focused, instead of thinking about stressors or tasks that need to be completed, aided productivity and reduced feelings of stress.

Not making progress towards rehabilitation goals was associated with negative emotions. The athletes felt frustrated, moody, discouraged, stressed, and irritable with a lack of progress or a rehabilitation setback. Even when the athletes felt they were putting in a lot of effort to rehabilitate, if noticeable results were slow or lacking then negative emotions were experienced. Alternatively, making rehabilitation progress (e.g., adding exercises, seeing physical results, or increasing activity) was associated with positive emotional experiences, such as feeling happy, excited, upbeat, motivated, and positive. Some described how making progress in rehabilitation, such as noticing physical improvement, helped to improve the day overall or spurred progress or productivity in other areas of life. For example,

*“... going to rehab and being productive in rehab allowed me to further be productive, you know, whether it is school or whatever else because I had that structure in and it was... another place where I could refocus... when you come out of surgery and you can't do anything you feel, I guess, helpless or bored. So, kind of getting back into things, you can see daily improvement on, say, your range of motion or your strength... so that's a continual renewal of your spirits...”*

## Shifting perspectives or reframing

Altering cognitions by shifting perspectives or reframing the situation/stressor was commonly described as a way of coping with stress or the challenges the athletes faced. These cognitive alterations changed the focus of their thoughts away from unhelpful thoughts, such as thoughts related to the injury, the unknown, or a stressor that negatively impacted their mood. Instead, the athletes reframed situations or shifted their thoughts in a manner that was more helpful or productive. Some athletes described using self-talk to help them alter their cognitions in a more positive direction, and one athlete used a visual aid on his cell phone to assist him in changing his perspective in the desired way. These shifts in cognitions were achieved using a number of different strategies, such as:

- changing their view of the situation (e.g., it could be worse, it is only temporary, considering the “bigger picture,” or viewing a situation as a challenge as opposed to a stressor);
- reframing (e.g., “it is not bad, just different”);
- viewing stressors as opportunities or challenges (e.g., for improvement, to grow, to learn, or prepare for the future);
- shifting their temporal focus from the past to the present or from the present to the future, whichever was more helpful in the moment;
- putting themselves in other people’s positions/making social comparisons (e.g., comparing one’s own injury to people with more severe or debilitating physical conditions);
- shifting their focus from the negative or stressful (e.g., not dwelling on the unknown) to the positive (e.g., deciding to focus on accomplishments instead of setbacks; enjoying the process)
- shifting their focus from the problem to finding a solution
- acceptance of the circumstances (e.g., choosing to “make the best of” unchangeable circumstances)
- acknowledging one’s own abilities to cope (e.g., recognizing that the “worst-case scenario” is often manageable)

**Focusing on the controllable.** Identifying what was controllable was an important coping strategy for some of the athletes. Focusing on elements of a situation that, at the time, could not be changed or were not under the athletes' control increased levels of frustration. Low control situations were described as stressful and had the potential to negatively impact moods. For example,

*"There have been a few late work nights this week which makes me tired for the next day. This stresses me out but there's nothing I can do about it."*

One athlete used the phrase "control my controllables" to describe the process of identifying what was (and was not) under her control, and then focusing on addressing the elements of the situation that were under her control. In her words,

*"You can only control yourself. So, I can control how I eat, I can control how I think and perceive certain situations, how I react to them or how I am... so controlling the controllables just means controlling myself... if I'm not seeing any progress with my quad growth... the only thing I can control is how much effort I'm putting into it, how much time I'm putting into rehab, if I'm eating properly that will help, drinking water, but I can't control how fast it grows."*

Other athletes also described accepting that some aspects of their stressors or problems were outside of their control, and then shifting their focus and efforts to things they could control or to finding solutions to problems. For example:

*"Finding out about my ACL graft weakening was pretty hard so I'm working with doctors to find out about the next step, and making sure I control what I can."*

*"I identified early that the situation (being late) was out of my control but I still had control of how the rest of the day was going to turn out. I focused my energy on that and ended up having a very productive work day."*

*"...I'm stressed out, I got a lot going right now, but like focusing on being stressed is not helping the stress, it's just going to amplify it. So, okay, I'm stressed out but like focusing on the solution is going to help that stress."*

**Using the past to inform the present.** Two athletes described ways in which they used their knowledge from previous experiences to aid in coping with current

problems or stressors. Past experiences with athletic injury and surgery provided one athlete with recovery benchmarks and an understanding of the recovery timeline. He noted similarities between the challenges he faced with his previous recovery and current recovery, and applied similar strategies to both recoveries. Another athlete used her injury and surgery experiences to make decisions about other medical issues. Applying past lessons and experiences to the present was a strategy that was not limited to rehabilitation or medical issues. One athlete described ways in which she applied lessons that she learned from one of her classes, such as how to set effective goals, to her life and rehabilitation, and more broadly, applied lessons from sport to other areas of life and relationships.

## **Emotion management and social support**

Efforts to cope with stressors that utilized emotion management strategies included recognizing and avoiding anger triggers, staying calm (e.g., taking deep breaths), using humor and eliciting positive emotions, having fun, using distractions (e.g., listening to music) or positive imagery to improve mood, taking action (e.g., become task-focused to stop rumination), and venting to social supports.

The athletes derived social support from a number of sources, including their teammates, coaches, rehabilitation specialists, family, significant others, school, friends, and pet animals. The types of social support received included financial (e.g., parental financial support, scholarships), emotional (e.g., providing empathy, understanding, comfort, and a sense of connection), practical (e.g., providing rides to complete errands, carrying things when the athlete was unable), educational (e.g., learning proper goal-setting strategies), and rehabilitation/medically-related (e.g., health care provider advice, learning about the rehabilitation process).

Teammates and coaches were important sources of support in specific, and sometimes opposing, ways. Although being in contact with the team was largely described as a source of motivation to return to sport, observing their teams at practice and competition was also difficult and was accompanied by negative emotions, such as feeling socially disconnected and frustrated at being unable to participate. Compared to other sources of social support, teammates were described as better able to understand the experiences of the injured athletes because of their shared experiences. Unrelated

to sport, teammates were helpful in other ways, such as discussing which classes to take or how to set a manageable school workload.

Not all social contact was supportive, and for some athletes there were important people in their lives, such as family members or coaches, who expressed doubts about the athletes' ability to return to sport. These reactions, however, motivated some athletes to prove those individuals wrong. For example,

*"... I play shortstop... it requires a lot of lateral movement, a lot of quick explosive movement, and my coach was like, oh, once this is done you probably won't return there, you'll go to a less agile position... shortstop is something I worked hard for, I had to prove myself to get that position... I want to prove him wrong, I want to get that spot back."*

**Similar others.** The participants described instances of comparing themselves to other people who have had similar experiences. These similar others included athletes, injured athletes, or other people in their lives who had sustained injuries. These comparisons seemed to serve several purposes. In some cases, comparing themselves to others who had been through a similar experience and had successfully recovered was a source of motivation, confidence, reassurance, encouragement, and hope. In other cases, it served to remind the athletes that their own situation could be worse, and helped them to feel less sorry for themselves. One athlete described becoming more empathic towards others who had experienced injuries, and for a few athletes these comparisons provided comfort in knowing he or she was "not alone." It was helpful and calming to receive empathic support and to talk to others who had been through something similar.

*"I talked with my one friend who had been in a serious car accident...Talking to her made me feel better, I have only one surgery, I shouldn't be feeling sorry for myself it could always be so much worse. It put me in a much more humble view point which has stuck with me this week."*

*"...that was by far very helpful, and I think that helped keep me calm in all of it. When I was feeling all worked up, like "oh, I'm never going to go back to sport, I'm never going to work in the industry, I'm screwed I might as well just lay in my bed for the rest of my life." And then talk to someone who has gone through a similar thing and been like,*

*oh it will get better, you have options still...those were some of the big things that kind of helped me keep going.”*

*“Watching some of the Olympics help me improve stressful situations. Hearing about the knee injuries of many of the alpine skiers helped with my confidence about returning to competition... Have been enjoying watching the Olympics and inspired to keep working hard.”*

## **Stress prevention strategies**

Throughout the journals, the athletes were asked to describe anything they did that helped them to prevent stressful things from occurring on the day of the journal entry. One way of preventing stress that was identified by many of the athletes was participating in rehabilitation and exercising. This involved increasing effort and working hard when doing rehabilitation exercises and making progress in rehabilitation. Stressors were also prevented by identifying potential stressors ahead of time and problem-solving to avoid the stress. Putting effort into being prepared ahead of time, staying organized, and maintaining a routine/schedule were also common ways to prevent stress. Specifically, the athletes described planning ahead and preparing for things like travel and job interviews, being organized (e.g., keeping a to-do list), maintaining a routine or schedule (e.g., using an agenda), and staying on top of work/school demands. Resting and taking breaks were also identified as ways to prevent stress. Taking physical breaks helped to prevent pain or injury aggravation, and taking mental breaks helped with “*unwinding*,” relaxation, and feeling overwhelmed. For another athlete, getting sufficient sleep was important to prevent stress. For another, yoga and meditation were key. Other ways to prevent stress included avoiding future pain or a need to worry about the injury. For example, one athlete described avoiding some activities entirely, learning her physical limits, paying careful attention to her pain, and caring for injury post-surgery. In her words,

*“I think by making good choices to avoid stressful situations is my best way at dealing with them. By avoiding things that will cause ill effects later I have been opting to just omit them. This way I won't have anything negative to deal with later.”*

Other stress prevention strategies included staying calm (e.g., taking a deep breath) in potentially stressful situations, walking away from potential conflict, maintaining a positive outlook (e.g., not dwelling, having fun at work), focusing on the controllable, changing perspectives, and pacing oneself. Maintaining focus on completing goals and tasks, such as studying or attending practice, was also a way to prevent stress as it diverted focus away from thinking about stressors but also increased productivity and progress towards goals. Thus, the athletes applied varied strategies to prevent stress. Strategies that were used reactively to manage current stress could also be applied proactively to avoid stress.

## **Effects of Coping**

The athletes often noted the effects (or the intended effects) of the various coping strategies they implemented or utilized. While many coping strategies were used with the intention of reducing or preventing stress, other outcomes were experienced. In some cases, the athletes noted how their coping strategies lessened negative emotional states (e.g., reduced feelings of panic, frustration, or worries), enhanced positive emotional states (e.g., more relaxed or at ease, improved mood, or more happiness), or helped with emotion management (e.g., avoiding interpersonal conflict). Their coping strategies also helped them to reduce or manage pain, improve overall sense of health, assist with pacing, enhance motivation, and aid in recovery. Coping strategies also helped to improve productivity, focus, confidence, and generally increase feelings of relaxation.

## **The Rehabilitation Process**

In this study, the athletes were asked to reflect back on the entire rehabilitation process and how they had been managing stressors since the injury. The athletes described the overall rehabilitation process in two ways. First, it was described as a long process with ups and downs, or good days and bad days. Terms such as “*long journey*,” “*whirlwind*,” and “*teeter-totter*” were used to describe the rehabilitation process. Second, the process was described as a learning experience through which the athletes learned about themselves and experienced personal growth. For example,

*“I still feel like it’s been a whirlwind. I feel that my recovery has been such a teeter-totter, some days I feel so good while other days were so bad.”*

*“It has been a wisdom gaining journey.”*

These two overall descriptions indicate that the athletes’ experiences throughout the rehabilitation process were variable and mixed; an inconsistent process in which they experienced high points and low points. Despite this, the athletes believed that they coped well overall with the rehabilitation process, gained valuable learning experiences, and underwent personal transformations over time. The athletes also tended to maintain a future-oriented perspective as they progressed through rehabilitation. They commented regularly on how they anticipated many things: progressing in rehabilitation, returning to sport, or the next year of school. Some athletes were also oriented towards long-term future plans unrelated to sport, and described an awareness that not rehabilitating could lead to long-term physical health issues which might impact functioning in areas other than sport, such as in their careers. For some, however, it was not helpful to think about potential future physical limitations that might result from the injury.

The research design of this study, weekly journal entries and a follow-up interview, allowed for some examination of processes and changes as they occur over time. These processes were explored in two ways. One way was by identifying changes or variations in particular concepts or themes week to week across the journal entries. The second was by asking the participants to reflect back on their experiences, which was done intermittently throughout the journal entries as well as during the interviews. The data were examined in these ways, and two processes that emerged are described next.

**Acceptance, learning limits, and adaptation.** Over the course of the rehabilitation process, the athletes described ways in which they accepted the consequences of their injuries and adapted in order to function in daily life. Their expectations, particularly of their physical abilities, needed to be tempered and adjusted. This was not necessarily an easy task; some found it very difficult to accept their injury and the consequences of it. As time went on, however, the athletes described becoming more adept at dealing with the injury and the associated changes to daily life.

Learning physical limits during rehabilitation was described as a challenging but important process in aiding recovery and preventing pain. This involved learning how long or how intensively to be physically active without risking re-injury or experiencing a pain flare-up while still making rehabilitation progress. The process of learning limits was exploratory and sometimes accomplished through trial and error. One athlete found this process particularly challenging because pain was delayed – there were no immediate indicators that she had pushed herself too far. For another, pain was an indicator of the severity of his injury and helped him to realize that he needed to reduce his activity levels and focus on rehabilitating. A delicate balance needed to be established in order to further rehabilitation while not putting oneself at risk of aggravating the injury. For example,

*“I want to do as much as I can to better my recovery without hurting myself. I still have a week and a half until I am out of the most dangerous part of my recovery. While still in this period I want to push myself while still ensuring that I am not putting myself at risk for re-injury which would be devastating.”*

*“I’m having a hard time figuring out how hard I can go so that I can get into better shape and heal my knee but not overdo it to impede the recovery.”*

Learning limits was a challenging process, particularly because the athletes described strong temptations to be more physically active than was medically recommended. For example,

*“The most frustrating part is that I feel different. While all my teammates are off working on hard cardio, I’m on a bike at a low resistance. I find this increasingly hard as I’m getting stronger and feel that I could maybe go for a light run (which is strictly prohibited by physio). The temptation is definitely there.”*

Learning physical limits involved acceptance of the fact the athletes’ physical abilities had lessened as a result of the injury and that there is a danger associated with pushing past those limits as recovery could be impeded or re-injury may occur. One athlete described this part of the process as accepting a new “*maximum*” in terms of physical exertion, and accepting that she was doing the best she could at the time. In her words,

*“... I think it was the first time I was like “wow,” like really hit me in the heart and was like, wow this sucks... but then after that it was like well, coming to the realization that this is... as good as I’m going to get... I’m doing all I can... their 100% in their sprints or whatever, and my 100% on this bike resistance at two might be equaling out, so it’s just something that I have to accept and that that is my maximum at that point.”*

Once accepted, the athletes could choose to focus on the aspects of their situations that were under their control and adapt to their current circumstances by adjusting or finding alternative ways of doing things, as described in detail earlier. This allowed them to cope with the injury and continue to manage daily life concurrently. Through this process, the injury, pain, and physical limitations became “*routine*,” “*habitual*,” and less frustrating, and these changes were associated with experiencing more positive emotions. For instance, one athlete wrote about this experience six weeks after her surgery,

*“I feel that I am getting to a point where my injury is just part of my everyday routine. I do my exercises and automatically put on my runners instead of flip flops when going out. I feel that less and less I need to go out of my way to look after my injury. This makes me happy that I’m slowly getting my days back to ‘normal.’”*

Another athlete described becoming less frustrated by her physical limitations over time:

*“I still get frustrated not being able to wrestle or do all the exercises I want to do but a little less frustrated than before.”* Seven weeks later, she noted, “*I feel less frustrated and mad about my injury now. I’m not as stressed or as bothered by challenges when doing the rehab exercises. I now better understand that it takes a long time to recover and I am less impatient.*”

One athlete described how earlier in the rehabilitation process she devoted a great deal of time to thinking about her limits. Over time, however, knowing her limits became “*second nature*,” and when she was able to operate within those limits she found she could better reduce or prevent stress. In her third weekly journal entry, she said,

*“Today I chose to know my limits, I stayed in the car when I know there would be lots of walking while running errands and was smart in finding new ways of carrying things while on crutches... I think I was smart to make these decisions. By stopping before I was frustrated or in too much pain it kept me in a pretty pleasant mood for the day. I think if I would have done things differently I would have been in a much worse mood.”*

Later, in week 10 of her journals, she commented,

*“Today I pretty much just rolled with the punches, by now I know my limitations and they are just second nature now. If I couldn’t do an activity I didn’t let it bother me, I just chose something else to do.”*

Strategies used to help stay within one’s limits included developing alternative ways of doing activities, getting help when needed, making friends or family aware of one’s limits, avoiding high risk activities, learning pain triggers, recording activity and pain levels, using self-talk to prevent pushing oneself to the point of pain, learning pacing, and taking breaks and resting. Using these strategies to stay within their current physical limits helped the athletes to avoid pain and aggravating the injury while making rehabilitation progress. Over time, their confidence in their physical abilities increased.

**Learning, growth, and benefit-finding.** The athletes described many ways in which they benefited from their experiences with athletic injury and rehabilitation. These benefits included learning, personal growth, and other positive outcomes. The athletes adopted “silver-lining perspectives;” ways in which they viewed their circumstances that allowed them to derive these benefits and see positives out of the process. For example,

*“... I do think I’ve learned a lot about myself and others through this time since my injury, after all I do believe that everything happens for a reason.”*

*“Obviously, I do not wish hardship on myself, but I am grateful for how these challenges have made me a better person and taught me about myself. I wouldn’t want to go back and be the person I was a year ago, because although I have faced some grueling challenges (especially rehab, injury and setbacks), I have grown a lot more since then and like to think I am a better version of myself.”*

For one athlete, the benefits she derived from her injury were so important to her that she described feeling glad the injury occurred. Because she was injured during what would have been her final year of sport, she was approved to play an additional year following her recovery. This also meant that because she was the oldest on the team, that she became a leader for her teammates. In her words,

*“...now I’m kind of glad it happened and I got the experience and the extra year...”*

**Learning.** The athletes described many different learning experiences, particularly when reflecting back on their progress over time. *“I learned a lot about myself”* or variants of that phrase were commonly used. The athletes reported learning about how they cope with stress. Other learning was more specifically oriented toward injury rehabilitation, such as learning physical limits and pacing, as described in more detail earlier, as well as gaining a better understanding of the recovery process, how to stay healthy, and how to prevent injury.

**Personal growth.** Throughout the process, the athletes described ways in which they developed as individuals. This personal growth was described as maturing and becoming more confident, independent, optimistic, patient, in-tune with one’s mind and body, and empathic towards others with injury or physical difficulties. The athletes described becoming more self-aware and developing a better understanding of their emotions. One athlete described how being away from his sport led to changes in his emotional reactivity. In his words,

*“... when the injury happened, I had to take a step back, just kind of like think my way through things a little bit because I’m not able to just jump into it like I was before. So, I think that’s what I was trying to get at, like linking the two is that injury made me less aggressive... less hard-headed, less stubborn... I have to use my head more now...”*

He linked this shift in being less aggressive to tactical benefits that he could apply on the field. He said,

*“... I find myself on the field thinking more and its actually helped my game...I try and predict like what the other person is going to do before they do it...having less*

*confidence in my physical ability has made me rely more on kind of the mental part of my game...”*

He viewed this change in himself as positive; being less aggressive or reactive helped him to avoid negative outcomes that could have occurred had he responded in such a way. Another athlete was grateful for the challenges she has faced and how they have molded her in a positive way to become more prepared for the future. In her words,

*“Even though I am sick of rehabbing and frustrated that I can’t play, I try to find positives and think of how I’m growing as a person... I try to think that these experiences will mold me into the best person and best physician... So, each challenge I face, I like to think of it as preparing myself for the future.”*

For another athlete, this personal growth was described as maturing:

*“I grew up a lot, I mean, I thought about things or think about things differently. Definitely get to see things from different perspectives. My value system changed...overall, I looked at things differently and coming home, after that injury, I was not the same, I was not in the same place emotionally...”*

Another area of growth described was an increased sense of mental toughness or resilience. The athletes described becoming better at coping over time; better at managing stressors, developing or refining coping skills (e.g., learning how to anticipate stressors and how to avoid them), and balancing their multiple roles. One athlete said managing stressors became easier over time, and another commented that she learned how much she can handle and this increased her confidence in her ability to manage future challenges. For example,

*“Managing stressors in any capacity has been much easier since the injuries. They’ve put me in a place where I’m mentally tougher and able to cope with situations.”*

Similarly, another athlete said,

*“...I think I learned how to deal with things better... and learned how to be patient...”*

## Reflections on the Journal

Two athletes reflected on the process of completing the journal entry portion of this study. Both athletes described becoming more self-aware of their ways of coping and emotions through the process of reflecting and self-analysis that was needed to complete the journals. One athlete used the journals as a way to stay accountable to her rehabilitation plan, track her progress, and become aware of setbacks. She also used the journal as a coping strategy. When asked in one journal entry what she did that day to deal or cope with stressors, challenges or stressful situations, she said,

*“I completed this journal – it helps me to realign my focus for the day and self-reflecting helps me to be productive.”*

This athlete also described feeling self-conscious in writing her journal entries because she was aware that someone would read her entries. The journal was also an additional source of support for her during her rehabilitation, and she described feeling a loss of support once she completed the journal entries.

## Withdrawn Participants

As described earlier, the four participants who withdrew from the study provided varying amounts of data through the weekly journal entries and did not complete interviews upon returning to sport. The data yielded from their participation was not included in the completed analyses, but were coded. An inspection of those codes revealed many similarities between these student athletes and those who completed the study in terms of reactions to the injury, stressors, and coping strategies used. Some differences were noted, however. For instance, there were fewer descriptions related to some themes, such as finding benefits and personal growth, finding alternatives, focusing on the controllable, and similar others. However, because the datasets were incomplete and no interviews were conducted with these participants to gather further data and engage in theoretical sampling to ensure the accuracy of the interpreted data, no definitive conclusions can be drawn about the reasons for these differences.

## Discussion

This study examined coping with day-to-day stressors and injury rehabilitation over time in a sample of university student athletes. Although nine student athletes were recruited, only five completed the study; the other four provided partial datasets before withdrawing from the study. Despite being a relatively heterogeneous sample of student athletes in terms of the sport played, the nature of their injuries, and gender, this group of athletes all suffered significant injuries that required longer-term rehabilitation and time out of sport (i.e., multiple months). The student athletes in this study described a number of benefits or positive aspects of the student athlete lifestyle in terms of social relationships, their overall university experiences, and their convenient access to athletic therapy. In line with previous research (e.g., Jolly, 2008; Macquet & Skalej, 2015; Wilson & Pritchard, 2005), the student athletes in this study identified their most prominent challenge as balancing and managing rigorous time demands and commitments. However, the athletes in this study identified different day-to-day stressors compared to studies that have examined sport or performance specific day-to-day stressors in elite athletes (e.g., Nicholls et al., 2006; Nicholls et al., 2005; Nicholls et al., 2009). In those studies, the most commonly reported stressors included physical errors, mental errors, injury, and difficulties with coaches. For the athletes in this study, non-injury related day-to-day stressors were school-related (e.g., completing homework, studying, receiving poor grades) and involved balancing school demands with athletic demands, as well as other stressors related to employment and interpersonal relationships. Further, because of the intensive time demands placed on student athletes, these stressors have the potential to have a compounding effect, and taking time to manage one stressor may take time away from managing another.

Although student athletes have been included in samples of elite athletes in studies of coping with injury rehabilitation, the results of this study indicate there are important reasons why this group of athletes should be examined separately. Elements of the injury rehabilitation process, such as attending medical or physiotherapy appointments, placed additional strain on their already full schedules. Non-student elite athletes, such as professional athletes for whom sport is their livelihood, may be in a position to focus more exclusively on their rehabilitation compared to student-athletes who are required to keep up their university workload and some level of sport

involvement (e.g., attending practices) while undergoing rehabilitation. The addition of free time was identified as a factor that positively influenced sport injury-related growth in injured athletes from varying competitive levels (Roy-Davis et al., 2017). In the current study, however, additional free time was not reported by those injured during the school year. This discrepancy suggests experiences of athletic injury do vary depending on context, and theories or models of injury responses may not uniformly generalize to all athletes. For instance, one athlete commented that she was glad her rehabilitation took place over summer months as she predicted it would have been much more difficult to rehabilitate during the school term. In addition, for some of the athletes in this study, there was additional pressure associated with maintaining good grades as a sport eligibility requirement. Further, in order to support themselves financially, university students often need to maintain employment over the summer months. For some of the athletes in this study, the injury prevented them from being able to hold their usual summer jobs. Seeking new employment that they were physically capable of doing or relying on their family to provide financial support over the summer placed additional stress on these athletes. Considering the broader context in which student athletes live and function offers a more holistic perspective on the nature of their daily stressors and the impact of those stressors on all domains of life, not just the athletic components. It is important to recognize the unique stressors experienced by injured student athletes as this can provide information regarding the specific types of supports student athletes, injured or not, may benefit from.

Some of the stressors associated with the injury rehabilitation process identified in this study mapped onto a number of Lazarus and Folkman's (1984) underlying properties of stressors. Event and temporal uncertainty, lack of predictability, and ambiguity are properties of stress that relate to some of the athletes' concerns regarding rehabilitation uncertainty, fear of re-injury, and lacking information on the rehabilitation process. Uncertainty about returning to sport, such as whether or not the athlete would be able to return to the same position or return to sport at all, was also a stressor. The timing of events (e.g., rehabilitating during the school term versus over the summer) also affected perceptions of stress. The overall duration of rehabilitation was a challenge, and the athletes in this study commented on the need to be patient with themselves during rehabilitation. One athlete's previous injury experiences reduced the novelty of the situation; this athlete specifically identified his previous rehabilitation experiences as

helpful in increasing the predictability of the rehabilitation process – he had a sense of what to expect. Future research may continue to explore the potential utility of identifying and addressing these proposed underlying properties of stress, rather than targeting individual stressors related to injury rehabilitation.

Thatcher and Day (2008) suggested ‘self and other comparisons’ as an additional underlying property of stress relevant to sport. In this study, some ‘other comparisons’ were described as a source of stress, such as viewing one’s physical limitations as a weakness compared to other athletes and watching practices or competitions when unable to compete. However, making comparisons to similar others was also a coping strategy that helped to reduce feelings of stress, in that the athletes in this study felt more hopeful about their ability to return to sport after learning about other athletes who had been through something similar. Making social comparisons is a way for individuals to assess whether their experiences are normative or not, and these comparisons can be considered “upward” when comparing the self to others who appear to be doing better, or “downward” when comparing the self to others who appear to be worse off (Poole, Matheson, & Cox, 2016, p. 187). According to Poole and colleagues, these comparisons can lead to positive or negative affective reactions, depending on whether the individual feels encouraged or discouraged by the comparison. In the current study, more “upward” social comparisons described by the athletes were associated with feelings of encouragement and hope for recovery when compared to athletes who were previously injured and recovered, but were a source of stress when compared to uninjured athletes. More “downward” comparisons with others with worse injuries or circumstances were associated with feelings of relief and reductions in self-pity.

## **Applying Models of Sport Injury Rehabilitation**

The applicability of a biopsychosocial model of sport injury and rehabilitation (Brewer, et al., 2002; cited in Brewer, 2007) in understanding the range of factors impacting and impacted by injury and rehabilitation was supported by this study. The injured student athletes’ experiences revealed that the process involved biological, psychological, and social factors. From a biological perspective, the athletes were affected by physical elements of the injury (e.g., pain, swelling, mobility limitations, etc.), which also impacted daily functioning (e.g., sitting in class, preparing meals, travel, sleep

disruption, etc.). The results also demonstrated the importance of using physical coping strategies, such as applying heat or ice and stretching, to manage injury symptoms and promote physical healing. From a psychological perspective, emotions, cognitions, motivation, behaviours, and learning all played a role and impacted, or were impacted by, the injury and rehabilitation process. For example, making rehabilitation progress positively affected mood. Psychological coping strategies were used regularly, such as cognitive reframing, and processes such as learning, experiencing personal growth, and adaptation are largely psychological in nature. From a social perspective, the support provided by the athletes' various social groups was generally described as valuable and helpful during rehabilitation. The support of teammates, administrators, and rehabilitation specialists was particularly important. Making social comparisons also played an important role in stress perceptions and coping. It is clear that all levels of biopsychosocial factors need to be considered in athletic injury.

In support of the integrated model (Wiese-Bjornstal et al., 1998) and in line with previous research, this study found that psychological responses to injuries were variable and changed over time. The injured athletes reported various positive and negative emotional and cognitive responses to their injury. Negative cognitive and emotional responses to the injury and rehabilitation process included fears, worries, negative mood, frustration, reductions in confidence, and concerns about appearing weak or being a burden to others. More intense negative reactions were also reported by some athletes; the injury experience was described as "traumatic" by one athlete, and another described being concerned about her mental health at one point during rehabilitation. These responses are in line with previous research, and support the contention that athletic injury has a negative impact on emotional functioning (Brewer & Redmond, 2017). These responses, however, were not static, but varied over time and with changing circumstances. For instance, feelings of frustration lessened over time as the athletes adapted to their circumstances. Emotional and cognitive states were also impacted by rehabilitation progress; when progress was made, the athletes felt excited, motivated, and more confident. As rehabilitation progressed, some athletes expressed a fear of re-injury which was coupled with excitement about returning to sport. The inconsistent and "up-and-down" nature of injury rehabilitation described by many of the athletes in this study is consistent with previous research (e.g., Ruddock-Hudson et al.,

2014; Tracey, 2003). Thus, positive and negative psychological responses occur in an interwoven fashion across the rehabilitation process.

Changes in personal development and athletic identities were also described. During the rehabilitation process, experiences of personal growth included improvements in coping abilities, confidence, maturing, and enhanced self-awareness. While rehabilitating, some of the athletes in this study described recognizing how important their sport involvement was once they were unable to participate. In other cases, attachment to sport and athletic identity diminished slightly. Marcia's (1994) description of identity moratorium, described earlier, may characterize identity development processes of injured student athletes. Although an injury may threaten one's sense of identity, these individuals are actively and concurrently involved in both sport and career-oriented post-secondary education, and as such, options for primary identity remain open. For instance, one athlete commented that it was his belief that having more components to his identity beyond being an athlete was protective in the face of injury. For athletes with less diverse identities, a serious injury may be more damaging to one's sense of self.

Within the integrated model (Wiese-Bjornstal et al., 1998), cognitive appraisals, an integral feature of the model, affect and are affected by the injured athlete's varied psychological responses and can be altered as circumstances or responses change over time. This study did not examine the nature of the specific cognitive appraisals involved in initial stress experiences (i.e., primary and secondary appraisals). The results of this study did reveal, however, that cognitive reappraisals were an important coping strategy for the injured athletes. For instance, cognitive coping strategies often involved making reappraisals (e.g., viewing stressors as challenges) and shifting or altering perspectives in helpful ways. Shifting one's focus onto controllable aspects of the situation was a commonly employed strategy, in which the athletes refocused on things they could control, change, or improve.

Consistent with previous research on perceived benefits and stress-related growth following sport injury, the injured athletes in this study derived benefits and described ways in which they developed and grew on a personal level as a result of going through the injury rehabilitation process. In particular, they described becoming more mature and better at coping. Reappraising situations as challenges and taking a

“silver-lining” perspective were cognitive strategies that appeared to be related to benefit-finding and personal growth. This is in line with the grounded theory of psychological resilience in elite athletes put forth by Fletcher and Sarkar (2012) and the grounded theory of sport-injury related growth by Roy-Davis et al. (2017), which suggest that adaptive cognitions, namely, challenge or positive appraisals and meta-cognition, facilitate adaptive responses to stress and the perception of benefits or growth. Through the process of facing and overcoming adversity, resilient athletes have reported positive outcomes and personal growth (Galli & Vealey, 2008; Tamminen et al., 2013). These theories may be useful models for examining stress and coping in injured athletes in conjunction with biopsychosocial and cognitive appraisal models, as these theories offer process-oriented descriptions that involve both person and social-environmental factors (Galli & Vealey, 2008) and emphasize the role of adaptive cognitions in facilitating adaptive stress responses (Fletcher & Sarkar, 2012) and sport injury-related growth (Roy-Davis et al., 2017).

The process of adapting to the injury and the ways in which the injury and associated physical limitations impacted daily life involved various psychological responses and the application of coping strategies over time, including acceptance, learning limits, finding alternatives, and focusing on the controllable. When coping is examined from a process perspective, it becomes evident that coping strategies are not necessarily employed in a discrete or pre-planned sequence. For instance, one athlete commented on the “trial-and-error” nature of learning her limits during rehabilitation, suggesting she experienced a non-linear process of taking action, receiving feedback, and altering actions accordingly as she adapted to life with the injury. Thus, her efforts at problem-focused coping were exploratory, and the process of adapting to physical limits and finding alternative ways of functioning in daily life may have been facilitated by other coping processes, such as acceptance and reframing. This is in line with Folkman and Moskowitz’s (2004, p. 753) assertion that some coping strategies may support or facilitate the use of other strategies throughout this dynamic process. While this study did not examine coping flexibility specifically, this construct may apply to these results. The meta-coping skills proposed in Cheng et al.’s (2014) conceptualization of coping flexibility included adaptation, evaluation, and monitoring. The process of adaptation as outlined above and the utilization of coping strategies such as learning limits, finding alternatives, and shifting coping efforts towards controllable aspects of the situation

suggest that the athletes in this study were evaluating and altering their actions and ways of coping with injury as a result of feedback received from their efforts and as circumstances changed. While Cheng et al.'s review found coping flexibility to be associated with more positive psychological adjustment to stress, the concept of coping flexibility may apply very well to coping with physical injury. In particular, learning physical limits during rehabilitation requires monitoring one's physical state and level of pain, adjusting physical activities accordingly, and evaluating the impact of those adaptations. The athletes in this study described this process as aiding in recovery, preventing pain, and reducing stress. Thus, coping flexibility may be a valuable construct for future research to explore within the context of athletic injury rehabilitation. While there are individual differences in coping flexibility (i.e., some individuals are more rigid in coping strategy application than others; Cheng, 2003), additional research is needed to determine the source(s) of individual variation in coping flexibility (Cheng et al., 2014).

## **Coping Strategies**

Grounded theory methodology asserts that themes and categories should emerge from the data and efforts should be made not to impose preconceived categories onto the data (Charmaz, 2014). Prior to beginning this study, the researcher was aware of the various coping categorizations previously proposed and used in related research. In order to prevent the application of preconceived categories or labels to coping strategies, coping strategies that emerged through the analyses were given descriptive labels but not grouped together based on existing categorizations. It is clear, however, that many of the coping strategies employed by the injured student athletes in this study fit into those existing categorizations. Categorizing coping strategies based on the focus of the strategy and on the method of coping (Moos, 1997) can be applied post hoc to the results of this study. In terms of the focus of the coping strategy, some coping strategies were problem-focused (e.g., rest to reduce swelling, finding alternatives). Others were emotion-focused, including emotional-approach (e.g., identifying anger triggers, using deep-breathing strategies) and avoidant (e.g., distraction) strategies. In terms of coping methods, the athletes in this study employed behavioural (e.g., participating in rehabilitation), cognitive (e.g., shifting perspectives), and social (e.g., engaging social support) strategies. Many of the coping strategies described, however, are not as easily categorized after the fact. Engaging social support can be both

problem-focused (e.g., receiving financial support from parents) and emotion-focused (e.g., receiving empathy). Planning and scheduling involve cognitive activity, but using and referring to one's day planner to stay organized throughout the day also involve behaviour. Even "becoming task-focused" includes both a cognitive and behavioural component; shifting attention toward the task and then doing the task.

Many of the specific coping strategies employed by the injured student athletes in this study have been identified in other studies as described previously, such as setting goals, activating social support, managing emotions, distraction, acceptance, and positive reframing. Time management, planning, and scheduling, however, were important coping strategies used by these athletes that have not been identified in previous studies as a primary coping strategy used by injured elite athletes. Because one of the primary stressors identified in this study was balancing demands and managing time, it makes sense that specific strategies would be developed and used to address that particular stressor. Again, this finding highlights the importance of considering the student athletes' specific circumstances and demands. Assisting student athletes in developing effective time management strategies likely would help them to manage this stressor, whether injured or not. This may be particularly important for athletes who are injured during the academic year, as the results of this study suggest rehabilitation places additional demands on their time during school terms and does not simply replace their sport involvement demands. However, it is also acknowledged that given the extreme demands on student athletes' time that there may be circumstances in which some tasks are not accomplished despite the use of effective time management strategies.

Another coping strategy that emerged as particularly relevant to injury rehabilitation was finding alternatives. This strategy exemplifies adaptation and problem-focused coping; the injured athletes developed alternative ways of functioning while their physical limitations temporarily prevented them from completing daily activities or exercise in the usual way. In order to accomplish this, the athletes learned to accept their current limitations, and flexibly or creatively come up with other ways to complete tasks.

Coping strategies were also applied proactively in an effort to avoid potential future stressors. In particular, participating in rehabilitation programs, planning and time

management, and making time for self-care, relaxation, and taking breaks were described as strategies used to prevent stress. These strategies emphasize maintaining a balance between recovering from the injury and other goals while ensuring the injured athletes cared for themselves (e.g., taking physical or mental breaks, getting sufficient sleep, limiting activity to manage pain). In this study and in others (e.g., Gould et al., 1997; Tracey, 2003), athletes who have experienced injuries in the past applied their prior knowledge of the rehabilitation process to their current circumstances in ways that helped them to maintain a positive focus and better cope with the current injury. Student athletes with previous injury experiences could be encouraged to use their own knowledge of the process in helpful ways.

In line with previous research, social support emerged as an important factor in the coping process. Support was derived from multiple sources and those sources provided various types of support. Teammates were important sources of empathic support and motivation, but being in contact with one's team during rehabilitation was also challenging for some athletes, as it increased feelings of frustration at being unable to participate. Coaches should be aware of the effect that ongoing sport participation can have on some injured athletes. While maintaining contact and involvement with teammates offers emotional support to the injured athlete, it should be understood that exposure to the team during practice and competition may increase negative emotional states, and some athletes may opt to avoid attending practice or games for this reason (Tracey, 2003). Injured athletes should be encouraged to maintain positive relationships with teammates during their recovery, but athlete reactions to being exposed to practice and games should be monitored and assessed by a sport psychologist or other clinician involved in their care to determine if opting out of viewing practices or games would be in their best interests, even if only in the short-term.

Another important source of support in this study came from health care providers, including physicians, surgeons, athletic therapists, and physiotherapists. These sources of support provided important information on what to expect at varying points during rehabilitation, how to manage pain, provided treatment, and outlined what levels of physical activity are safe as the rehabilitation process progresses. Having realistic information on the rehabilitation process was important in facilitating coping and managing expectations for some athletes in this study. Health care providers can provide injured athletes with information that reduces uncertainty and ambiguity

regarding their injury and the rehabilitation process, two of the underlying properties of stress outlined by Lazarus & Folkman (1984). Bone and Fry (2006) also highlighted the importance of providing injured athletes with accurate information regarding the nature and severity of their injury, and engaging in collaborative goal-setting and rehabilitation planning (p. 164). Interventions designed to aid athletes in developing effective goal-setting strategies have been found to improve motivation, confidence, and performance (Vidic & Burton, 2010). Further, an empirical review of psychosocial factors influencing recovery in athletes with ACL injuries found support for the role of goal-setting and positive self-talk in improving rehabilitation program adherence, including at-home rehabilitation, and rehabilitation outcomes (te Wierike, van der Sluis, van den Akker-Scheek, Elferink-Gemser, & Visscher, 2013). Goal-setting may be a valuable strategy to employ as a part of rehabilitation programs.

Although not a purpose of the study, the results also speak to participants' experiences of completing the journal portion of the study. Of particular interest is the finding that, for two athletes, the process of completing the journal entries was linked to a better understanding of their coping responses and strategies. In short, if they had not been asked, they may not have become aware of the various ways in which they coped with stress. Utilizing a reflective/narrative approach to studying coping might be an important method for future studies to consider, as the process of reflecting may enhance awareness of coping strategies, as opposed to having participants select the coping strategies they employed from a checklist, for example. There is also some evidence to suggest that written emotional disclosure exercises may help to improve emotional states during long-term injury rehabilitation (Mankad & Gordon, 2010) and reduce levels of stress (Mankad, Gordon, & Wallman, 2009). Further, Wadey et al. (2011) have suggested that the process of reflection may be a mechanism through which injured athletes become aware of and perceive benefits of the injury process (p. 154). Together, these findings have applied implications as well. For instance, clinicians working with injured athletes can consider including self-reflective practices into counselling/support sessions to enhance coping self-awareness and opportunities to discover benefits or positive outcomes of the injury process. Further, athletes may also benefit from reductions in stress levels and improvements in mood.

On the other hand, one athlete in this study described feeling self-conscious in completing the journal because she knew that someone (i.e., the researcher) would read

her responses. This participant also, however, described the journal as a source of support, and upon completion of the study, she described feeling the loss of that support. Tracey (2003) also found that, in her interview study with ten injured university student athletes, the researcher became a source of support to the participants who commented that they appreciated being able to talk about their experiences (p. 290). It may be important for future studies employing a similar methodology to consider that this may occur. Participants could be forewarned that they may have this experience or participants could be debriefed about this issue at the end of the study and provide suggestions or referrals for similar forms of support when possible. Further, the results of this study indicate that the student athletes often benefited from learning about the injury experiences of similar others. Providing injured student athletes with opportunities to discuss their experiences and relate to others who have gone through or are going through something similar may be a very helpful source of support (Tracey, 2003).

While this study did not attempt to assess the relative effectiveness of particular coping strategies, the athletes involved described the effects their coping strategies had, or were intended to have. Certainly, stress reduction was an intended effect of coping, but other important effects were also noted, including improvements in mood states or emotion management, improved productivity, enhanced motivation, and coping efforts, all of which also supported injury recovery. As noted earlier, research on the effectiveness of coping strategies has been challenged by the difficulty associated with determining appropriate outcome measures (Folkman & Moskowitz, 2004). Personal goals certainly need to be considered in assessing coping strategy effectiveness. Measures of stress reduction are warranted in determining if a strategy reduces stress, but in the case of this study, making forward movement and progress towards the participants' goals (e.g., injury recovery, academic goals, etc.) were noted as positive effects of coping. Further, through the process of balancing demands, athletes in this study employed time-management strategies to cope with the heavy time demands required of their multiple roles. However, in some cases, it was noted that some demands were prioritized at the expense of others. Does this suggest that the athletes were ineffective in managing their time, or that the time-management strategy was not the most effective choice in that circumstance, or that a perfect balance was not achievable in that situation? Determining the benefits of coping strategies extends beyond reductions in subjective or objective stress levels to include goal-directed or

valued outcomes that are personally relevant. Further, coping effectiveness may be relative and context-dependent, not absolute.

As coping research programs continue to evolve, investigators may wish to consider whether using discrete categories of coping is the most appropriate and useful way to understand coping strategies, or if other conceptualizations are more helpful. Coping categorization based on timing (proactive vs. reactive), focus (problem vs. emotion), and method (cognitive, behavioural, emotional, or social) could provide a more useful matrix for identifying and categorizing coping strategies in future research. While this matrix may not be exhaustive in terms of outlining all of the facets of coping (e.g., approach vs. avoid), it might improve communication between researchers regarding the coping strategies being investigated. Context and situational factors, however, still need to be considered. For example, managing time using a day planner could be considered a proactive, problem-focused, behavioural coping strategy if used on a Sunday evening before a busy and potentially stressful week, or it could be a reactive, problem-focused, behavioural strategy if used on a Wednesday of a week that has had some unexpected added demands or setbacks making what would have been a normal week more stressful.

## **Strengths and Limitations**

The methods and design of this study have a number of strengths and limitations. One strength of the study is that it began to address a gap in the literature by conducting an in-depth examination of the experiences of a population that has been understudied within the context of athletic injury. The use of weekly journals has both strengths and weaknesses. The weekly journals allowed the researcher to access close to real-time perspectives and appraisals of stressors, stressor impact, and coping responses over a period of time. Journal methods are useful in reducing recall bias and for examining within-person processes over time (Gunthert & Wenzel, 2012). The participants were asked to reflect on their stressors and coping responses that occurred that day, over the past week, and they were also asked to reflect on how they had been managing stressors since their injury. In terms of recall, the daily reflections were less likely to be affected by memory decay compared to the weekly and “since injury” reflections. Retroactive reports of coping have been found to be discrepant from daily reports in a sample of college students, which is likely due to memory decay (Ptacek,

Smith, Espe, & Raffety, 1994). Asking participants to report on their stress and coping experiences in the moment (e.g., ecological momentary assessment methods) would be expected to reduce problems with the memory decay associated with retrospective accounts. However, according to Folkman and Moskowitz (2004), "...momentary assessments might also elicit literal reports of specific thoughts and actions, and miss the broader conceptualizations of coping that are better perceived with the benefit of some retrospection..." (p. 749). Thus, requesting that the participants reflect back over varying time frames may have provided insight into specific thoughts and actions close in time to when they occurred and insight into the participants' broader understandings of the overall coping with injury rehabilitation experience. Further, Folkman and Moskowitz suggest that narrative approaches (i.e., asking participants to provide an account of their thoughts, feelings, and actions as they occurred throughout a stressful situation) can be useful in revealing previously unidentified coping strategies and "...defining the domains of stressors that are relevant for the study population" (p. 751). This study utilized daily, retrospective, and narrative-like approaches, and while the various methods of assessing and studying coping each have strengths and weaknesses, using multiple methods may be the most advantageous approach in some circumstances (Folkman & Moskowitz, 2004, p. 751).

The results of this study have limited generalizability due to the small sample size. The attrition rate was high – nine participants were initially recruited with five of them completing all data collection components. It is noted, however, that this can be a common problem with this type of research. For example, Nicholls, et al. (2006) reported a 60% drop-out rate in their longitudinal daily diary study of stressors and coping among rugby players. Lazarus (2000b, p. 668) contends that while a longitudinal study with repeated measures is a desirable approach to studying coping phenomenon, it is very challenging (in terms of cost and effort) to obtain data from participants over extended periods of time, and this problem limits sample size and generalizability. In any event, given the sample size, the results of this study should be interpreted with caution. The degree to which participant self-selection bias may have occurred is also unknown. For example, perhaps the athletes that completed the study were "better copers" in that they were better able to manage the additional time demand of completing the journal entries compared to those who dropped out of the study. It is also noted that the participants who withdrew from the study were generally younger (age range 18-21) compared to

those who completed the study (age range 20-23). One study found differences in the coping strategies employed between senior and junior student athletes; more senior student athletes used more problem-focused coping strategies than junior student athletes, who used more emotion-focused strategies and social support to cope with stressors (Macquet & Skalej, 2015). However, differences in coping effectiveness based on seniority were not examined. Because the athletes that dropped out of this study did not provide explanations for withdrawing, any ideas on the reasons why are speculative.

Although this study collected data at varying points throughout the injury rehabilitation process and following return to sport, the athletes in this study provided data at different points in their rehabilitation and were out-of-sport for varying amounts of time. Thus, direct comparisons with respect to stress and coping at specific phases of rehabilitation (e.g., one-week post-injury, four-weeks post-injury, two-months post-injury, etc.) cannot be made. That being said, more general comparisons of the injury recovery process over time and across athletes revealed some overall trends, such as the processes of acceptance, adaptation, and personal growth. Finally, as noted earlier, given the sample size, the results cannot be considered an exhaustive representation of the experiences of student athletes coping with injury and other stressors. The findings from this study do, however, bring to light important differences between student athletes and non-student athletes coping with injury that warrant further study.

## **Recommendations**

A number of research and applied recommendations have been suggested throughout this discussion. Additionally, the results of this study suggest that, based on the unique circumstances of the injured student athlete, further investigation into this specific population is warranted. Future researchers may wish to expand on this study's research design in various ways. For example, data could be collected from all participants at the same specific time points during rehabilitation to examine similarities and differences in coping throughout the phases of rehabilitation. Mixed-methods research designs could be utilized to examine larger samples of injured student athletes; quantitative measures could be used to identify student athletes reporting specific stress or coping experiences of interest, and those individuals could participate in a more in-depth analysis of that particular experience. This approach might be particularly useful in identifying and examining the experiences of injured student athletes who are struggling

to cope and may not be able to devote their limited time and resources to participating in a longitudinal study. Both the biopsychosocial model (Brewer et al., 2002, cited in Brewer, 2007) and the integrated model (Wiese-Bjornstal et al., 1998) identify social demographic factors, such as age, gender, ethnicity, or sport played, as impacting the injury rehabilitation experience. As noted above, differences in coping with time management have been identified between first and third-year students (Macquet & Skalej, 2015), and racial issues were sociocultural factors that affected the resilience process in African American athletes (Galli & Vealey, 2008). Further, it is known that gender differences exist in terms of help-seeking attitudes (Leong & Zachar, 1999) and behaviour (Rickwood & Braithwaite, 1994), and emotional disclosure and coping strategies (Tamres et al., 2002). This study aggregated all data across genders, however, it may be that male student athletes employ coping strategies differently and may be less likely to disclose emotionally-laden information about their stressors and injury experience. These factors should be examined further in future research, both within the context of coping with sport injury as well as coping with adversity in athletics more generally.

In terms of clinical implications, the above discussion has offered a number of suggestions that may be useful to university athletic departments and personnel, specifically to those involved in sport injury rehabilitation (physiotherapists, physicians, sport psychologists, etc.). In addition, student athletes who are unable to maintain their usual vocational activity due to their injuries and may experience financial strain. Individuals working with those athletes may be able to support them further by offering referrals to the university's financial aid or awards systems for information on bursaries or other financial supports for those athletes without athletic scholarships. Student athletes could also be referred to university health services or clinics for psychological assistance or employment counselling for assistance in finding work they are physically capable of while rehabilitating. Student service and athletic departments could consider developing athlete specific referral processes to facilitate access to supports or peer-based support programs, such as peer-led stress inoculation training (Fontana, Hyra, Godfrey, & Cermak, 1999). For example, the University of Guelph recently implemented a pilot student athlete peer-support program that offers mental health and well-being information and support services (Armstrong, 2017).

## Conclusion

Most studies that have explored psychological responses to injury and coping have not considered broader contextual factors that may affect student athletes' experiences in coping with injury. Student athletes are a unique population that experiences significant athletic injuries within an academic setting—a setting that makes many unique and challenging demands on a student athlete's time and energies. The results of this study indicate that injured student athletes do experience stressors that differ from other groups of injured high-level athletes, and use coping strategies that are uniquely directed at those stressors. Managing injury rehabilitation placed additional strain on the student athletes' already very demanding schedules and activities; time, resources, and energy are finite. Despite such challenging circumstances, the student athletes in this study utilized multiple coping strategies, demonstrated adaptability, and benefitted from their experiences in various ways. Student athletes', or any athletes', broader life circumstances and the ways in which those circumstances might impact or be impacted by injury-related stressors should be considered given the dynamic person-environment transactional nature of stress and coping.

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# Appendix A.

## Weekly Journal Template

This journal entry includes open-ended questions about your experiences with respect to how you are dealing with stress, demands and challenges. Although I am interested in stressors and problems related to your injury and sport involvement, I also want to know about how the stressors and demands from other areas of your life have impacted you today, this past week, and over the course of your injury rehabilitation. Please reflect on your experiences and answer the following open-ended questions. There are no right or wrong answers, and you may write as little or as much as you like. At the end of the questions is a space for you to write about anything else you would like to share about your experiences. Please feel free to print a copy of your journal entry if you wish.

### PART A - TODAY

1. Did you encounter **any stressful situations or deal with any challenges today**? If so, can you tell me about those experiences, no matter how big or small they might seem? Remember, these stressors or adversities might be related to your sport, injury, school, or any other area of life.
2. Can you describe anything you did today to **deal or cope with stressors, challenges or stressful situations**?
3. Can you describe anything you did today to help **improve any stressful situations**?
4. If you did anything today that helped to **prevent stressful things** from occurring, could you describe what you did?
5. What effects, if any, did these stressors/challenges and/or your attempts to deal with them have on your day or how you felt today?
6. Is there anything else you would like to say about your day?

## PART B – THIS WEEK

1. If you encountered any **stressful situations or challenges this week** (no matter how big or small), please write about how you managed or reacted to those situations?
2. Is there anything else you would like to say about your week?

## PART C – SINCE THE INJURY (please complete this section for journal entries 4, 8, 12, and 14 only)

1. Looking back to the day you were injured, how have things been for you since that event?
2. How you have been managing or reacting to stressors since your injury?  
Remember, these stressors or adversities might be related to your sport, injury, school, or any other area of life.
3. Is there anything else you would like to say about your experiences since your injury?

## Appendix B.

### Interview Guide

“Thank you very much for agreeing to participate in this interview, and to discuss with me your experiences as a student athlete and with your injury. I’m going to ask you some questions about your experiences, some of which are related to the information you provided in your journal entries. However, we are free to talk openly about whatever comes up during the interview; the questions are just a guide for us. For instance, if you feel like you have something you would like to share with me that would be relevant to this discussion, go ahead and tell me about it. There are no wrong answers, all I want is to gain a deep and accurate understanding of what life as a student athlete has been like for you. Do you have any questions before we begin?”

1. How would you describe the demands and challenges you face as a student-athlete?
2. Looking back on your injury rehabilitation, what were the biggest challenges you faced?
3. As you may recall, I am interested in learning about how you managed stressors related to both your injury rehabilitation and day-to-day life as a student athlete. What were effective or helpful ways of coping with the stresses and challenges during this time? What was not effective or helpful?
4. How did your injury impact your daily life? How did your daily life impact your injury?
5. Looking back on your injury rehabilitation, do you notice any changes or learning anything about yourself as a result of going through that experience? What does this mean to you?
6. What role has being part of your team and sport played in your injury rehabilitation? In your day-to-day life?