

A Brief Educational Intervention Using Acceptance and Commitment Therapy: Four Injured Athletes' Experiences

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The purpose of this study was to research the experiences of four injured athletes during their rehabilitation from ACL injuries and to examine the potential usefulness of an adapted ACT intervention in addressing individuals' adherence to rehabilitation protocols and their general psychological well-being. We investigated the usefulness of a brief, 4-session ACT program adapted for educational purposes and presented data as case studies. The case studies suggested that (a) the injured athletes experienced a multitude of private events immediately following injury, throughout their recovery, and when approaching a full return to sport; (b) the injured athletes typically avoided these private events and engaged in emotion-driven behaviors; (c) an adapted ACT approach for educational purposes could be useful on at least a basic level to help injured athletes accept private events, commit to rehabilitation behaviors, and have some certainty about returning to sport; and (d) more could be done to address the needs of injured athletes beyond the structure of our 4-session educational intervention. We concluded that the ACT-based intervention, to a certain extent, educated injured athletes about how to meet the challenges of their recoveries and how to commit to their rehabilitations, as well as to exhibit behaviors that would potentially permit their successful reentries to sport.

Keywords: ACT, injury, sport, mindfulness, rehabilitation

Injury in any walk of life often means some form of alteration to daily living (National Center for Injury Prevention and Control, 2000). In a sporting context, injury cannot only mean an alteration to daily living, but may also result in the forced withdrawal from training and/or competition either partially or completely (Williams, Rotella, & Scherzer, 2001). For athletes, the experience of injury can be interpreted in both positive and negative ways. Nevertheless, the emotional experiences associated with athletic injury highlight the struggle some athletes encounter when injured and emphasize the need to actively assist athletes in overcoming the psychological hardships of athletic injury. Athletes who attempt to return to sport

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following injury without having their psychological concerns addressed face a number of risk factors, including a greater risk of reinjury (Williams et al., 2001). The risk of reinjury is suggestive of a vicious cycle whereby injured athletes who return to sport with psychological distress are likely to experience subsequent injuries and progress through another rehabilitation protocol without having their concerns addressed (Williams et al., 2001).

Psychological distress is not only likely to influence athletes when returning to full sport participation, but it is also likely to influence their adherence to rehabilitation protocols (Williams et al., 2001). Athletes who are experiencing distress surrounding their injuries may attempt to hasten their recoveries in an attempt to return quickly to their roles as sportspeople. Alternatively, injured athletes may avoid rehabilitation protocols because they raise uncomfortable or painful sensations (both physically and psychologically). In either case, limited adherence to a rehabilitation protocol jeopardizes the likelihood of a successful recovery and places athletes at greater risk of reinjury upon returning to full sport participation.

Research on long-term athletic injuries such as ACL injuries suggests that the distress that athletes experience throughout the injury process is not constant but instead changes over time (LaMott, 1994; Morrey, 1996). Researchers have demonstrated that following initial distress around the time of surgery, ACL injured athletes report fewer emotional difficulties (as measured by scores on the Emotional Response of Athletes to Injury Questionnaire-ERAIQ) before distress levels rise again as they approach full recovery (LaMott, 1994; Morrey, 1996). Morrey, Stuart, Smith, and Wiese-Bjornstal (1999) suggested that the initial heightened distress of athletes experiencing long-term injuries is due to adjustment difficulties stemming from uncertainties following injury, where as the decrease is due to acceptance of the injury recovery process and a sense of certainty about rehabilitation protocols. Distress levels are speculated to rise again toward the final stages of physical recovery, because athletes are often concerned about their abilities to successfully return to sport and the fear of reinjury.

An Intervention for Assisting Injured Athletes During Reentry to Sport

A sizable body of research supports possible strategies aimed at combating the struggle injured athletes may experience throughout their rehabilitation as well as their reentry to sport (Brewer, Jeffers, Petitpas, & Van Raalte, 1994; Cupal & Brewer, 2001; Rock & Jones, 2002; Ross & Berger, 1996). In the majority of these papers aimed at addressing the emotional experiences of injured athletes, the interventions employed drew on second-wave cognitive behavioral approaches. Although support for second-wave approaches exists (e.g., Cupal & Brewer), research supporting the effectiveness of third-wave behavioral approaches in addressing the emotional experiences of athletes has come to the fore. Acceptance and commitment therapy (ACT) is one such third-wave cognitive-behavioral approach that has received much attention and empirical support for its usefulness in both clinical settings (Hayes, Strosahl, & Wilson; 1999; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996) and, more recently, sport settings (Gardner & Moore, 2004, 2007; Schwanhausser, 2009; Thompson, Kaufman, De Petrillo, Glass, & Arnkoff, 2011).

ACT Theory

ACT is rooted in relational frame theory (RFT), a contemporary behavioral approach to understanding human language and cognition that was developed in the early 1990s (Hayes, Barnes-Holmes, & Roche, 2001). Briefly, at the core of RFT is the manner in which language and cognition interact with direct contingencies on behavior. Individuals are said to make links between events and symbols (i.e., language and cognitions) so that each represents, at least partially, the functions of the other. For example, an individual who experiences trauma may encounter some form of emotional pain as an immediate result and may reexperience similar emotional pain simply by reporting the traumatic event at a later date. In this example, the symbols used to report the traumatic event may also spread to other symbols through a network of related terms. For example, trauma may elicit emotional pain, and emotional pain may trigger an anxiety response. Therefore, trauma and anxiety, which were not previously related in this context, become inherently connected. RFT also emphasizes the importance of internal private events (e.g., cognitions, memories, emotions, bodily sensations, urges) in understanding how language and cognitions influence behavior. Specifically, RFT highlights that symbols associated with private events often have their function altered due to them being evaluated broadly as “positive or “negative.” In the case of private events that are evaluated as negative (e.g., anger, anxiety, sadness—depending on the context), it is a basic component of the human condition to avoid such experience, a phenomenon referred to in RFT and ACT as experiential avoidance (Hayes et al., 1999). Experiential avoidance is the intentional evasion of particular private events due to an individual’s unwillingness to remain in contact with these events. Individuals who are engaging in experiential avoidance do so with the intention of altering the form or frequency of private events and the contexts in which they are presented. Such avoidance is reinforced by the immediate alleviation of uncomfortable and unwanted private experiences but often jeopardizes the general functioning and well-being of the individual. Maladaptive and/or clinical levels of experiential avoidance are characterized by an excessive entanglement with cognitions that support the use of experientially-avoidant behaviors and lead to psychological inflexibility. For a more detailed description of RFT and its links to ACT, readers are directed to the work of Hayes and colleagues (Hayes et al., 1996, 1999).

ACT targets six core processes with the goal of increasing psychological flexibility: (a) cognitive defusion, (b) experiential acceptance, (c) mindfulness, (d) self as context, (e) values, and (d) committed action. Psychological flexibility is defined as the ability to connect with the present moment fully as a conscious human being and to change or persist in behavior when doing so serves valued ends (Arch & Craske, 2008; Hayes, Luonma, Bond, Masuda, & Lillis, 2006). A description of the six core processes ACT addresses in establishing psychological flexibility follows (also see Figure 1).

Cognitive Defusion

Cognitive defusion is the unbinding of cognitions and contexts (e.g., the thoughts one has stemming from a particular situation or event). If the relationships between cognitions and contexts are weak, then behaviors are likely to be determined by personal values (McCracken, 2006). To achieve cognitive defusion, individuals are

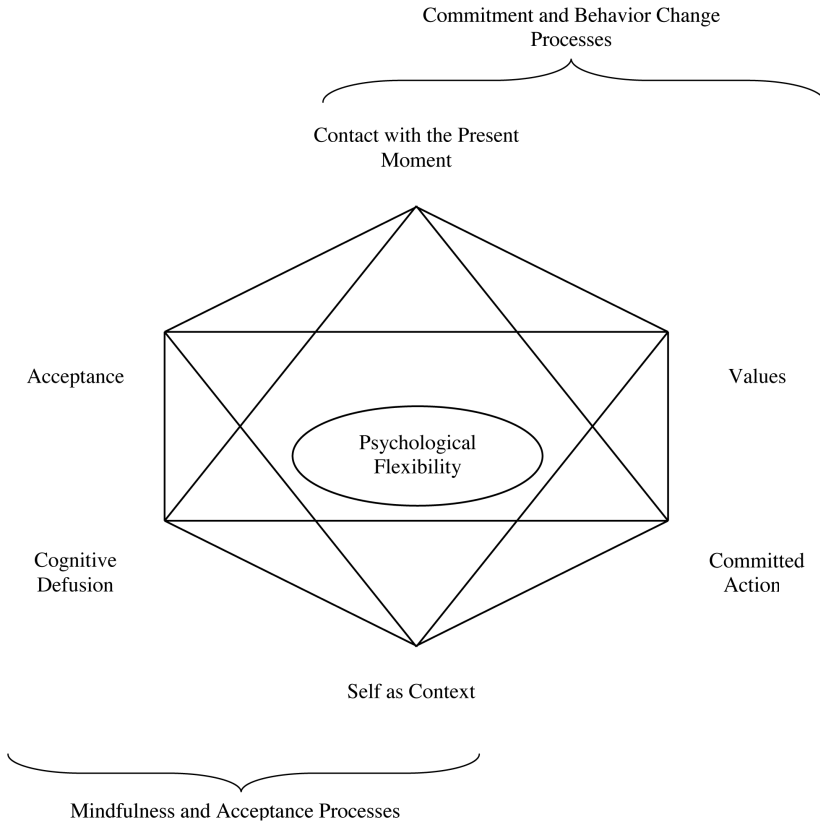


Figure 1 — ACT model of processes aimed at strengthening psychological flexibility (Hayes et al., 2004).

educated about techniques that unbind the relationship between cognitive events and specific contexts. Perhaps the most common cognitive defusion technique is labeling the process of thinking (“I’m having the thought that I am a failure”). Such procedures are designed to reduce the literal quality of cognitions, weakening their regulatory strength, and emphasizing the direct experience instead (Hayes et al., 2006). Injured athletes, for example, who are tightly fused with thoughts about reinjury, may benefit from being taught cognitive defusion skills to distance themselves from cognitions that may otherwise restrict them from adhering to a rehabilitation protocol.

Acceptance

Acceptance involves actively and consciously embracing internal private events without altering their form, frequency, or situational sensitivity (Arch & Craske, 2008; Heimberg & Ritter, 2008). For example, individuals with anxiety are taught

to experience the private events associated with anxiety without struggling against such experiences. Theoretically, acceptance allows individuals to invest in functional behaviors without the fear of evoking “negative” private events, which in turn allows individuals to demonstrate behaviors consistent with personal values (Hayes et al., 2006). Athletes learning concepts surrounding acceptance are often encouraged to engage in particular behaviors *despite* the existence of uncomfortable and unwanted emotions (Bernier, Thienot, Codron, & Fournier, 2009; De Petrillo, Kaufman, Glass, & Arnkoff, 2009; Gardner & Moore, 2007; Moore, 2009; Schwanhausser, 2009). For example, injured athletes may be encouraged to accept emotions such as frustration about rehabilitation setbacks, boredom from being withdrawn from usual activities, and/or anxiety about reinjury. Acceptance of one’s emotional states allows athletes to connect more easily with the present moment and to focus on the task at hand—in the case of injured athletes, adhering to rehabilitation protocols (Gardner & Moore, 2007).

Mindfulness

Because psychological inflexibility is characterized by the mind’s occupation with cognitions related to previous occurrences or future events, ACT educates individuals on techniques of being present minded. In ACT, individuals learn to experience moments as they occur, which allows for value-driven behaviors providing individuals with psychological flexibility (Hayes et al., 2006). The ability to remain focused on the present has been found to be particularly important for performance outcomes in sport. Gardner and Moore (2007) stipulated that the delineation between *mindful awareness* and *mindful attention* is important to acknowledge and understand. Gardner and Moore described mindful awareness as “the process by which one learns to notice and accept a variety of thoughts and emotions as naturally occurring phenomena that are not necessary to control” (p. 73). This description is distinguishable from mindful attention, which they defined as “the ability to self-regulate task attention” (Gardner & Moore, 2007, p. 73). In the case of injured athletes, mindfulness awareness may be useful in drawing individuals’ foci to the private events they are experiencing throughout their rehabilitation as well as encouraging such events to come and go without trying to control the experiences. Mindful attention may be useful for injured athletes to draw their focus to rehabilitation exercises to ensure correct execution of movements and to gain maximum benefits from physical interventions.

Self as Context

In essence, individuals are educated about how to detach from a conceptualized self (i.e., the “thinking” self) and to view the self as context (i.e., the “observing” self). This process fosters cognitive defusion and acceptance and increases the likelihood of individuals achieving psychological flexibility (Arch & Craske, 2008; Hayes et al., 2006). Viewing the self as context is often a skill taught through the processes of mindfulness. Practitioners typically encourage individuals to avoid describing themselves by their perceived roles (e.g., athlete, coach, student, parent) and to start viewing themselves as a being with transient experiences. This approach may be important to injured athletes who, during long-term injuries, may begin to view themselves as being defined by their role as an “injured athletes” rather than

acknowledging the fleeting nature of the experiences. Injured athletes who view themselves as context would be more accepting of uncomfortable private events during rehabilitation, which may benefit their recovery in the long run because they may be more compliant to particular rehabilitation protocols.

Values

Individuals who are unclear of their own values often revert to achieving goals that foster an attachment to the conceptualized self and consequently lead to psychological inflexibility. Experiential avoidance, and the behaviors used to engage in experiential avoidance, typically contradicts the personal values of individuals, as they instead serve only to avoid or alter one's immediate negative internal state (Hayes et al., 1996). Values are defined as being chosen qualities of purposive action that can never be obtained as object-like goals but can be attended to moment-by-moment. Uncovering values allows individuals to follow through with consistent behaviors, assuming they have paved the way by learning and successfully incorporating cognitive defusion, acceptance, and mindfulness techniques (Hayes et al., 2006). One particular distinction individuals are introduced to when considering values is the difference between value-driven behaviors and emotion-driven behaviors. Value-driven behaviors are those that represent individuals' desired personal qualities. For example, an injured athlete who values commitment as a personal quality may ensure he or she attends all physiotherapy sessions, takes the advice of professionals literally, and completes prescribed unsupervised tasks and exercises to the fullest. In contrast, emotion-driven behaviors are those that are dictated by the emotional experiences of an individual and can jeopardize the pursuit of values. For instance, an injured athlete who values commitment, but is entangled with anxiety about returning to sport, may avoid attending physiotherapy sessions, ignore the advice of professionals, and be noncompliant with prescribed unsupervised tasks and exercises, because all three events raise unwanted anxiety or other uncomfortable emotions and cognitions. Not surprisingly, the exploration of values may be beneficial in assisting injured athletes through their recoveries, because it encourages them to persist in value-driven behaviors in the face of particular psychological experiences.

Committed Action

Guided and motivated by values, committed action is similar to concepts of traditional behavioral therapies, and almost any coherent behavior change method can be incorporated into an ACT protocol, including exposure, skill acquisition, shaping methods, and goal setting (Arch & Craske, 2008; Hayes & Duckworth, 2006). Committed action needs to be supported by additional processes outlined in ACT such as cognitive defusion, acceptance, mindfulness, and values. Consider, for example, athletes who are firmly aware of their values for participating in sport and are able to manage the uncomfortable and unwanted private events that arise during the pursuit of such values. Such athletes would be able to commit readily to particular behaviors that are associated with their values as well as maintain committed action by employing mindfulness and acceptance skills. Intuitively, knowledge of the process of committed action would be beneficial for injured athletes in assisting them through their recoveries.

Support for ACT

Research evaluating the effectiveness of ACT in both sporting contexts and the clinical domain has grown substantially over the past decade, and empirical evidence demonstrates that ACT successfully addresses both the functionality and psychological well-being of individuals. For example, a meta-analysis of 32 studies ($n = 6628$) demonstrated that ACT processes were correlated moderately ($r = 0.42$) with psychological outcomes across a variety of clinical disorders including depression, generalized anxiety disorder, and posttraumatic stress disorder (Hayes et al., 2006). Specific to the topic of anxiety, studies have supported the effectiveness of ACT in addressing social anxiety disorders (Block, 2002; Dalrymple & Herbert, 2007), workplace stress (Bond & Bunce, 2000), test anxiety (Zettle, 2003), agoraphobia (Levitt, Brown, Orsillo, & Barlow, 2004), anxiety related distress (Kashdan, Barrios, Forsyth, & Steger, 2006), and panic disorder (Felder, Zvolensky, Eifert, & Spira, 2003). In these cases, the mechanism of change postulated by ACT is said to occur on multiple levels. ACT interventions are said to influence anxiety and other clinical or subclinical issues by decreasing experiential avoidance, thereby increasing acceptance and inevitably value-driven behaviors (Forman, Herbert, Moitra, Yeomans, & Geller, 2007).

In support of this, Bond and Bunce (2000) demonstrated that stress reduction in a workplace setting was mediated by the acceptance of undesirable cognitions and emotions. In addition, two studies examining the effectiveness of ACT for psychosis supported the importance of cognitive defusion as a mechanism for change (Bach & Hayes, 2002; Gaudio & Herbert, 2006). In both studies comparing individuals in one of two conditions (ACT and treatment as usual), patients in the experimental condition were less likely to believe their delusions to be true and be rehospitalized in the future, compared with the control participants. In addition, in both cases, findings pointed to a mediating role of believability in ACT's superiority. As a final note on the support for ACT's mechanisms of change, Creswell et al. (2005) reported the beneficial effects of an experimental intervention emphasizing reflections on personal values. Specifically, compared with control participants, those who were instructed to reflect on personal values had reduced cortisol responses to laboratory stress tasks.

In the field of sport psychology, ACT (as well as other mindfulness-acceptance based interventions) has received growing support as an effective means to improve the performance and psychological well-being of athletes. One study in particular reported that individuals' performances on a canoeing training apparatus improved following a sport-modified ACT intervention compared with a matched control condition that received hypnotherapy (Garcia, Villa, Cepeda, Cueto, & Montes, 2004). A recent study by Watson (2008) investigated the effectiveness of ACT in accepting experiences associated with performance anxiety in golf. Watson carried out four adapted ACT sessions with 14 golfers who identified themselves as experiencing performance anxiety. The sessions sought to educate participants on topics of cognitive defusion, mindfulness, and values with the purpose of providing the golfers with skills to accept uncomfortable and unwanted private experiences while committing to performance-related behaviors. The study reported a functionally significant change in performance (as measured by player handicap) with participants' performances improving over the course of the four sessions. Further,

Watson reported that the majority (90%) of participants perceived a positive change in their performance anxiety.

Formal mindfulness-acceptance based interventions, including the mindfulness-acceptance-commitment (MAC) approach to performance enhancement (Gardner & Moore, 2004, 2007), mindful sport performance enhancement (MSPE; Thompson et al., 2011), and mindfulness-based cognitive therapy (MBCT; Segal & Williams, 2002), have received attention in the sport literature (see Moore, 2009, for a full review). Specifically, research has shown that mindfulness and acceptance based interventions have contributed to performance enhancement of athletes, where more traditional approaches have fallen short (Bernier et al., 2009; Schwanhausser, 2009; Wolanin, 2005). Research has demonstrated that overall psychological well-being also significantly improves in individuals who undergo such programs. Schwanhausser (2009) and De Petrillo et al. (2009) reported that individuals exposed to a MAC and MSPE intervention, respectively, showed decreases in scores on sport anxiety. Such results demonstrate mindfulness and acceptance approaches as being effective for the enhancement of athletic performance and overall psychological well-being. It is therefore plausible to expect that an adapted ACT approach would be beneficial for injured athletes in both their adherence to rehabilitation procedures and improvements in their general well-being during recovery. Thus, the intention of our study was to research the experiences of four injured athletes during their rehabilitation from ACL injuries and to examine the potential usefulness of an adapted ACT intervention in addressing individuals' adherence to rehabilitation protocols and their general psychological well-being. Based on a few previous uses of short ACT-based programs (Bernier et al., 2009; De Petrillo et al., 2009; Watson, 2008), we investigated the usefulness of a brief, 4-session ACT program adapted for educational purposes.

Method

Participants

Four athletes (2 males and 2 females, age range 18–49) were recruited from a sport academy, a physiotherapy center, and an orthopedic practice in Brisbane, Australia. A more detailed description of each participant is provided in the case study section below.

Materials

Demographic Questionnaire. A demographic questionnaire was developed to gain an understanding of the participants' general backgrounds, sporting histories, and sport injury histories.

Acceptance and Action Questionnaire-II (AAQ-II). The AAQ-II (Bond et al., 2010) is a 10-item, self-report measure that assesses the construct of psychological flexibility or, more specifically, acceptance. Responses range from 1 (*never true*) to 7 (*always true*) with higher scores indicating greater acceptance. Across seven samples with a population pool totaling 3,280 participants, the AAQ-II has been shown to have high internal consistency (mean $\alpha = 0.83$). The AAQ-II has also been reported to be high in concurrent validity (Bond et al.), demonstrating strong

correlations between measures to which it is theoretically connected (e.g., AAQ-I, $r = 0.82$; Beck Depression Inventory-II, $r = -0.71$). In addition, the AAQ-II has been shown to predict variance in both self-report and objective measures in important health and work-related outcomes as well as thought suppression and personality dimensions (Bond et al., 2010). A sample item is "It's OK if I remember something unpleasant."

Mindfulness Attention Awareness Scale (MAAS). The MAAS (Brown & Ryan, 2003) measures individuals' general tendencies to be attentive and aware of the present-moment on a 15-item self-report questionnaire. Responses are recorded on a 6-point Likert-type scale ranging from 1 (*almost always*) to 6 (*almost never*). High scores indicate a greater ability to be attentive and aware of the present moment. A high internal consistency ($\alpha = 0.82$) was reported for the MAAS along with promising convergent and discriminant validity findings (Brown & Ryan, 2003). Specifically, the MAAS was significantly positively correlated with openness to experience, emotional intelligence, and well-being and negatively correlated with rumination and social anxiety and unrelated to self-monitoring. A sample item is "I find it difficult to stay focused on what's happening in the present."

Sport Injury Anxiety Scale (SIAS). The SIAS measures anxieties associated with athletic injury (Brown & Ryan, 2003). The 29-item self-report inventory measures anxiety across seven subscales typically associated with sport injury anxiety related to losing athleticism (e.g., "I am losing athletic potential"), being perceived as weak (e.g., "Some people think I am faking it"), experiencing pain (e.g., "I am in a lot of pain"), loss of social support (e.g., "I lose some social support"), letting down important others (e.g., "I am letting my teammates down"), reinjury (e.g., "I think that I am more likely to get injured again when I return"), and an impaired self-image (e.g., "I worry about getting fat"). Individuals respond on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with an additional option of "not applicable." The SIAS has been reported to have strong internal consistency ($\alpha = 0.95$) and equally strong measures of reliability for the seven subscales (alpha coefficients ranging from 0.81 to 0.90). A factor analysis supported the construct validity of the SIAS, demonstrating that items mapped onto their intended factors for the seven subscales (Cassidy, 2006).

Procedure

Participants attended weekly the one-on-one educational sessions for four weeks following reconstructive knee surgery. A four-session program was deemed appropriate due to two previous studies demonstrating the usefulness of a short mindfulness-acceptance based intervention in sport (e.g., De Petrillo et al., 2009; Watson, 2008) and the time-scarce lifestyles of athletes. Participants were initially provided with an informed consent form and an information sheet and involved in a brief semistructured interview aimed at obtaining an understanding of the participants' experiences of their injuries from onset up until their current circumstances as well as predictions regarding their remaining rehabilitation and their reentry to full sport participation. Participants then completed a battery of questionnaires consisting of the demographic questionnaire, the AAQ-II, the MAAS, and the SIAS. Participants were asked to complete this battery of questionnaires again following

the four-week intervention. A second semistructured interview was also completed at the end of the fourth and final session to investigate athletes' perceptions of the intervention. Upon completion of the data collection, participants were provided with a debriefing form and given the opportunity to ask questions of the researcher. A trained masters student who had undergone both basic and advanced training courses in ACT and had used ACT in his role as a supervised therapist, administered the four-week intervention under the supervision of an associate professor who was a fully registered psychologist.

Adapted ACT Approach. Over the four sessions, participants were introduced to components of ACT during one-on-one sessions. The program reflected an educational intervention consistent with previous research that has highlighted the effectiveness of such approaches (e.g., De Petrillo et al., 2009; Watson, 2008). In order of delivery, the components of the four ACT-based sessions were cognitive defusion, mindfulness, acceptance, and values. The other two components of the ACT approach, while not explicitly included, were implicit within the four sessions (e.g., values and committed action were linked). During the first session, focusing on cognitive defusion, the therapist aimed to teach participants techniques for unbinding themselves from their cognitions. Participants were educated on methods by which they could observe thoughts or images without interpreting them as reality. The topic of the second ACT-based session was mindfulness and aimed to train participants in mindful awareness. During this session, participants were directed through a number of mindfulness scripts aimed at enhancing their consciousness of their physical surroundings and internal private events. The topic of the third ACT-based session was acceptance. The aim of this session was to provide participants with skills they could use to accept uncomfortable and unwanted private events without struggling against them. Athletes were directed through a script designed to address the aims of the session. The aim of the final ACT session was threefold: to introduce participants to the notion of values, identify participants' own values, and identify factors that have been inhibiting value-driven behavior. Although, as with all sessions, the content differed depending on the individual, all participants were exposed to the same concepts and underlying themes. At the end of each session, participants were provided the opportunity to ask questions of the therapist and debrief from the session.

Case Studies

In accordance with the Ethical Principles for Psychologists and Code of Conduct (American Psychological Association, 2002), confidentiality will be maintained by referring to the four case studies using pseudonyms.

Case Study 1: "Brian"

Case Introduction. Brian was a 49-year-old Caucasian male who participated at a social level in numerous competitive sports including squash (primary sport), tennis, and cycling. Brian reported that he had been participating in his primary sport for 30 years and that he was currently competing at his highest level of competition. He also reported that he spent roughly 10 hr per week in sport-related activities

(training and competition) and that he participated in his primary sport all year round. He was recruited for our study via his physiotherapist who was treating him for an ACL injury incurred while skiing. Brian had not ruptured either of his ACLs before his current injury, nor had he experienced any other injuries that had forced him out of training or competition in his sporting history for longer than one week. According to information Brian received from his physiotherapist, upon commencement of the adapted ACT intervention, he was roughly four months away from complete recovery (i.e., complete function of his knee and the ability to participate fully in sport).

Assessment. Brian's scores on both the AAQ-II and MAAS indicated that before commencement of the intervention, he was highly accepting and mindful of personal experiences. His preintervention SIAS score indicates that Brian was highly anxious about his injury. Following the intervention, Brian's scores on the AAQ-II and MAAS decreased slightly. Similarly, his injury-related anxiety scores also decreased slightly. We argue that no clinically significant changes in acceptance, mindfulness, or injury-related anxiety were recorded in Brian's responses to the questionnaires from time 1 to time 2 (see Figure 2).

Preintervention Interview. During the preintervention intake, Brian illustrated the emotional challenges he had experienced from the onset of injury to his current recovery status. Brian described that initially following the onset of his injury, he was unsure about the severity of what had occurred. He commented, "[I was] uncertain about the extent of what I had done, hoping it hadn't been extreme." When he was informed that he had ruptured his ACL and would require surgery leading to between six and nine months of recovery, he stated that he "nearly died." Brian's initial shock was coupled with difficulties adjusting and accepting the limitations of his injury. He commented that "[the] process is long and tedious . . . virtually everything I did in terms of activities I couldn't do anymore . . . you know that, but the reality

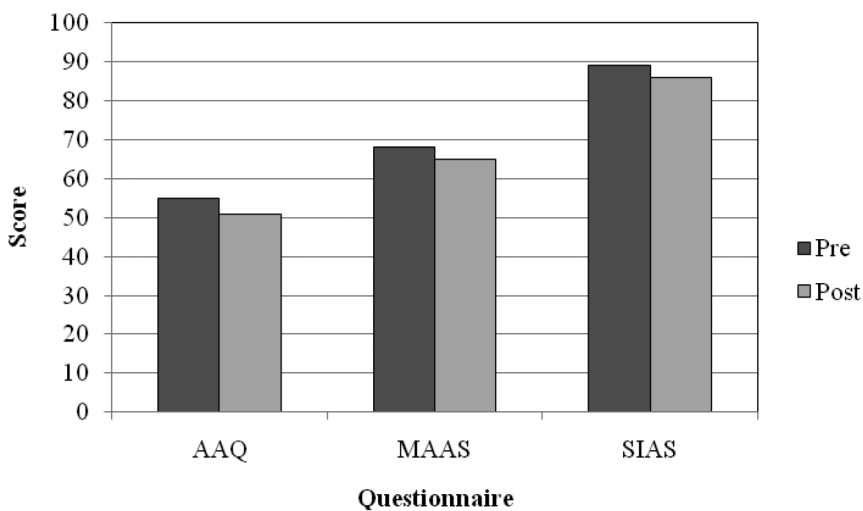


Figure 2 — “Brian’s” pre- and postintervention scores.

is something else.” He also acknowledged that his recovery was boring and that it was a struggle to restrain himself from participating in activities he enjoyed but that would jeopardize his recovery: “basically I’m bored out of my brain . . . I have to balance overcoming the boredom and making a bad choice, so [my physiotherapist] emphasizes that pretty importantly. But it’s hard when you’re that sort of person.” Brian also showed uncertainty about his reentry to sport following full recovery: “I wonder if at the reentry point, will I be adjusting what I do, or will I deal with it at the time.” He also commented, “I am trying . . . to discipline myself to trust myself when I am ready for the next gate.” These statements illustrated the potential that Brian would engage in emotion-driven behaviors but that he also acknowledged the importance of acceptance and mindfulness.

Postintervention Interview. During the postintervention interview, Brian communicated his understanding of skills learned in sessions. Regarding cognitive defusion, Brian stated, “[I’m] not going to be guided by a small incident or a thought that builds . . . I can deal with things that don’t have the right to have so much of an impact on me, I know that they are just thoughts.” Cognitive defusion appeared to be a novel skill learned by Brian during the sessions: “I was surprised at the impact on [a thought] that I would have considered as a really important, but an unhelpful thought . . . the defusion thing happened and it really surprised me.” Brian also identified the importance of and his use of mindfulness learned from the sessions: “There is a tendency to think that because I’ve had a thought that it’s real or I’ve got to do it, whereas it might be from who knows where and have no worth at all. I think that recognition is valuable.” He also commented that the skills learned in session allowed him to commit to value-driven behaviors: “I know I don’t have to stop everything that I’m doing.” Brian also applied the skills of the sessions outside of his rehabilitation: “I’ve probably thought about applying some of these ideas more to normal life issues” and appreciated the short-term nature of the intervention: “What I liked most was that in a short period of time you see a whole framework of how to view and approach life in terms of how to deal with issues either in a sporting, injury, or general realm.” Brian also commented that the use of metaphors was useful. One improvement that Brian suggested was to have a one-page summary of each session to take away and reflect upon.

Case Study 2: “Emma”

Case Introduction. Emma was a 21-year-old Caucasian female who was recruited for our study via a sport academy. Her primary sport was football (soccer), which she had been playing for 15 years. Emma was both a state and national representative who spent roughly 11 hr per week in sport related activities (i.e., training and competition) all year round. She ruptured her ACL while competing in her primary sport and had no prior history of ACL injuries, despite having had five other injuries that had prevented her full participation in football for more than one week. At the time of intervention, Emma stated that she had roughly six months remaining before she was likely to be fully recovered and return to full training and competition.

Assessment. Similar to Brian, Emma’s scores on the AAQ-II and MAAS decreased slightly between pre- and postintervention data collection. Her SIAS scores reflected a slight increase in sport anxieties associated with her injury.

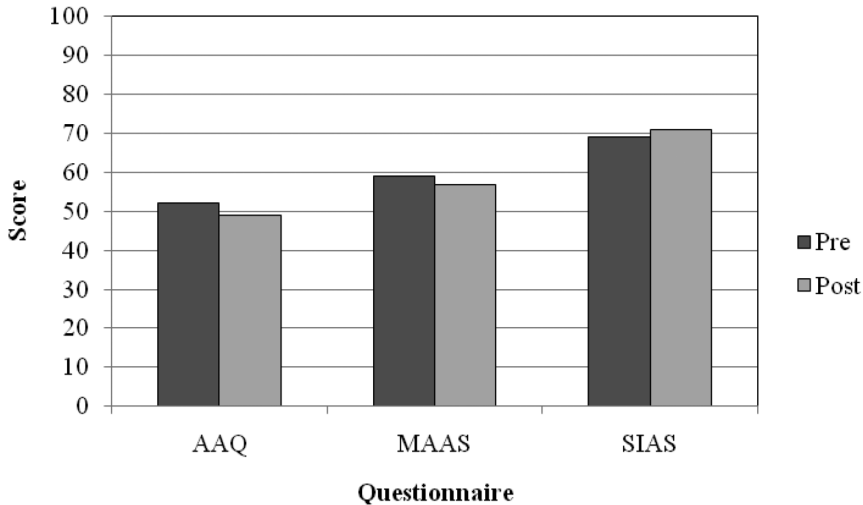


Figure 3 — “Emma’s” pre- and postintervention scores.

Again, there appeared to be no clinically significant changes to Emma’s scores on the measures (see Figure 3).

Preintervention Interview. During the preintervention interview, Emma described herself as an individual who had encountered a number of unwanted and uncomfortable emotions from the onset of her injury and over the course of her rehabilitation. During the initial stages of her injury, she reported being distressed: “I was crying the whole time.” In the lead up to ACL reconstructive surgery, she noted that she was stressed, but that stress changed to frustration during the early stages of recovery because of the slow progress she was making compared with one of her teammates who also had an ACL injury. Emma also reflected that she had “lost a bit of motivation” and that “I don’t have anything to look forward to this year at all.” Her recollection of her journey through injury also suggested that she was avoiding a number of private events. For example, immediately following her injury she recalled, “I didn’t let myself believe it” and “I didn’t feel anything,” which suggested that Emma was ignoring her cognitions and emotions surrounding what appeared to be a challenging time for her. She also demonstrated her unwillingness to accept the experiences of her rehabilitation: “I just want to get it over and done with.” Finally, Emma raised concerns about her reentry to sport and her fear of reinjury: “I’m worried about doing my other knee as well and what this one is going to be like because it’s common for someone to do one knee and come back and do the other.”

Postintervention Interview. Following the intervention, Emma appeared to have developed a sound understanding of the acceptance-mindfulness approaches and the benefits of committing to her rehabilitation protocols despite the private events she may experience. For example, Emma commented, “normally I don’t want to train so I don’t, but now I am more aware since I’ve had these sessions that I need

to do the training and get on with it.” She also commented, “I think all the thoughts are still there, but now I am more aware of them. I think I still take it as I am, but being aware of the thoughts is going to allow me to get on with what I need to do.” These statements are in stark contrast to Emma’s preintervention interview where she appeared to be avoiding such experiences and potentially jeopardizing her rehabilitation. She also displayed some idea of self-as-context: “in terms of the program, nothing will change, but I think it more within myself that will change.” We believe this statement reflects Emma’s change in her approach to acceptance and mindfulness of private events and demonstrates her understanding of the transient nature of her experiences. This change in acceptance and mindfulness was also supported by Emma’s views about reinjury cognitions: “I will try not so much to fight against [thoughts about reinjury], but just accept it . . . it’s just a thought and a thought doesn’t change my behavior.” Despite a change in her acceptance and mindfulness, Emma still appeared to be avoiding some private events: “I’m really bad at rehab . . . I just don’t like it. I’d rather be playing.” When asked what was ineffective about the intervention, Emma commented, “some things didn’t work for me.”

Case Study 3: “Maria”

Case Introduction. Maria was an 18-year-old Caucasian female whose primary sport was football (soccer), which she had been playing for seven years. She competed at the state level—her highest level of competition—spending roughly 12 hr per week training and competing all year round. Maria ruptured her ACL during a competitive football match and was recruited for our study via a sport academy. This injury was the second time Maria had ruptured her ACL. She also reported that she had experienced roughly four other injuries that had prevented her from participating fully in her sport for more than one week at a time. During the initial session, Maria noted that she was roughly one month away from full recovery and reentry into full competitive sport and training.

Assessment. Maria’s scores on the AAQ-II increased from pre- to postintervention. Her MAAS and SIAS scores stayed fairly similar over the two time periods, but decreased slightly. The results of Maria’s AAQ-II suggested a clinically significant change in her acceptance of private events, but no confident conclusions about changes to her mindfulness or anxieties about sport injury can be drawn (see Figure 4).

Preintervention Interview. Because this was the second time within the space of two years that Maria had ruptured her ACL, she was more certain about the process of rehabilitation and the emotional challenges she was likely to encounter. Even immediately following her injury, Maria acknowledged that she was aware of what she had done and that while frustrated, she was not as anxious about her rehabilitation and reentry to sport as the first time she injured her ACL: “It’s a lot different to my first [injury] because I’ve been through all the emotions and everything that was hard to go through . . . it’s easier this time. This time it’s more just waiting to get that clearance, not having a fear of what to do. So that’s been a lot easier and I’ve come back a lot quicker this time as well.” Although this statement highlights the differences in Maria’s experience of her reinjury compared with her initial injury, it also highlights how acceptance may support a quicker recovery

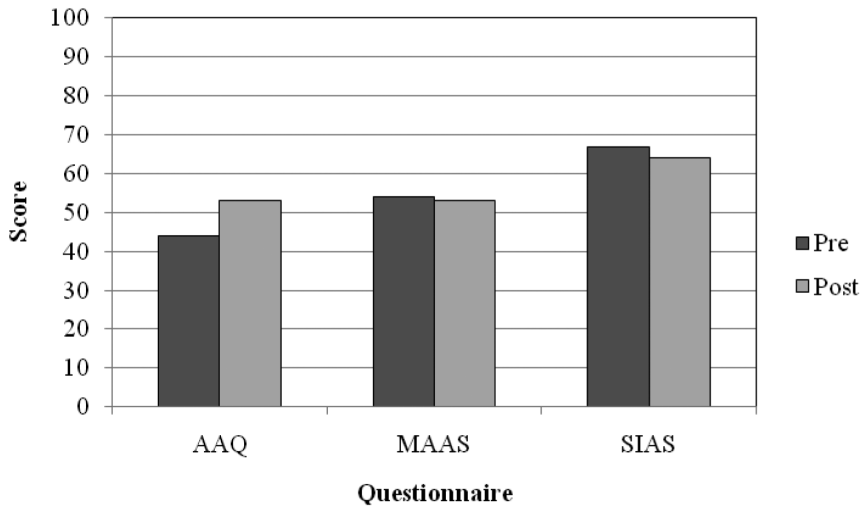


Figure 4 — “Maria’s” pre- and postintervention scores.

from athletic injury. Nevertheless, Maria’s second ACL injury also raised unwanted emotions such as frustration and illustrated that she still encountered testing private events: “The second [injury] was frustrating, I had to start from square one again and do everything the same.” This frustration appeared to have influenced her rehabilitation behaviors negatively and also related to the strong belief that she only had a limited time to reach her athletic potential: “I’m rushing back this time. A lot of my frustration is ‘let me get back. I need to get back’ . . . I guess it’s fear that this is the only chance that I am going to have.” She also mentioned that she was concerned about her ability to perform successfully following reentry to full competition: “[poor training] puts doubts in my mind, like can I do it when I go back on the football field.”

Postintervention Interview. Overall, Maria appeared to gain a sound understanding and a number of useful skills pertaining to acceptance and mindfulness that related to her injury, rehabilitation, and reentry to sport. She commented that the intervention “has made me more aware of what is going on.” In reference to cognitive defusion and mindfulness, she stated, “it’s like you can pull away and be like, ‘okay, it’s just a thought, that’s all it is’ and then look at it a different way.” Another statement that reflected this line of thinking was, “you can sort of think about your thoughts and be ‘yeah it’s a thought’ and let it go.” Maria’s cognitive defusion skills also reflected increased acceptance and commitment to rehabilitation: “These skills taught me to be more motivated, to realize your thoughts and let them come and go.” She also identified that her approach to rehabilitation would not be made any easier by her newfound skills, but that she was accepting of the hardships of recovery: “Physically, it’s still hard, but now I know these skills, it won’t be as emotionally hard.” Further, Maria alluded to the usefulness of reviewing her values for participating in sport: “doing these sessions helped me to look at why I play sport.” Finally, Maria identified that, although mindfulness and cognitive defusion

were skills that she gravitated toward with ease, she struggled with understanding acceptance completely and commented that “some things were harder to learn.”

Case Study 4: “Jake”

Case Introduction. Jake was a 21-year-old Caucasian male who ruptured his ACL for the first time while participating in his primary sport of sailing. Jake had participated in sailing for 13 years and was competing at the national and state level before his injury. He participated in sport related activities (i.e., training and competition) for roughly 10 hr per week for 9 months of the year. Aside from his ACL injury, Jake had sustained four other injuries during his athletic career that had prevented him from fully participating in his sport for more than one week. Jake was recruited for our study via his physiotherapist who informed Jake that he was roughly one month away from full recovery and reentry to sport at the time of our initial session.

Assessment. Jake’s scores on the AAQ-II decreased substantially from pre- to postintervention data collection. This change suggested that Jake became less accepting of private events. His pre- and postintervention scores on the MAAS underwent little change but were slightly higher postintervention. Finally, Jake’s SIAS scores increased across the two data collection times, suggesting that he was experiencing more anxieties about his injury following the intervention (see Figure 5).

Preintervention Interview. During the preintervention interview, Jake frequently demonstrated that his actions and beliefs were strongly dictated by his emotional states. Predominately, he held a strong belief that his choice of actions in both rehabilitation and reentry were determined by his confidence level. Two statements

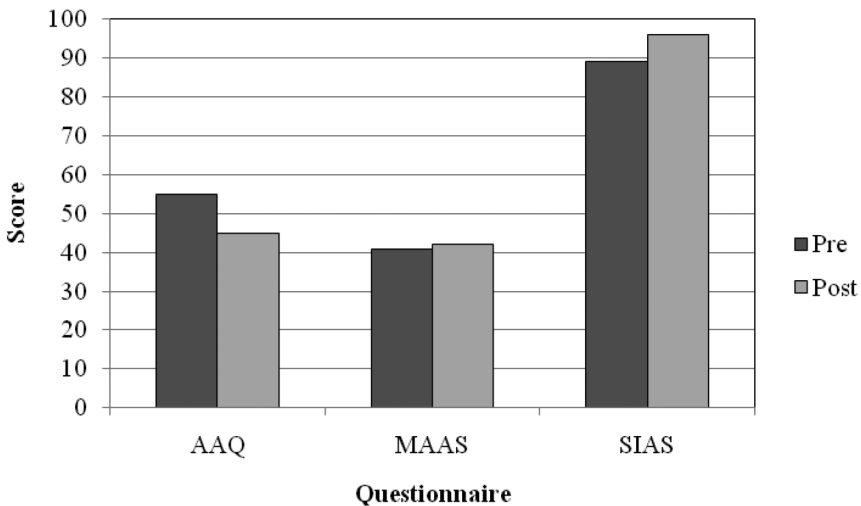


Figure 5 — “Jake’s” pre- and postintervention scores.

that reflected this belief were “I’ve got to build up my confidence to do rehab exercises” and “I know in the initial stages of physio I took it really easy because I wasn’t confident.” Jake also noted anxieties about reinjury. He made comments such as, “I’m afraid of having to go through the whole process again. I hate being dependent” and “I’ve been scared the whole time through the recovery that I’m going to injure it again.” The unwillingness to accept private events—whether surrounding confidence or reinjury anxieties—appeared to have prevented Jake from fully committing to rehabilitation protocols. Because he had avoided particular rehabilitation exercises, Jake was conscious that he was at the stage where he had to “step over certain boundaries” to make a full recovery, but that it seemed he had left it late considering he was one month away from the usual full recovery milestones of individuals experiencing typical ACL injuries. He acknowledged that he “probably tends to put up my own limits as such to protect myself from reinjury” but was unable to see that his avoidance of rehabilitation protocols potentially placed him at greater risk of reinjury in the long-term.

Postintervention Interview. During the postintervention interview, Jake communicated a basic understanding of some of the concepts discussed in sessions and highlighted how he had been able to, or would be able to use the specific skills. For example, he noted that he was able to relate differently with private events: “I probably won’t make such a big deal about certain emotions that don’t need as much thought or not giving something as much credit as it wants.” He commented that cognitive defusion techniques were particularly useful: “I can use the little voice in my head telling me what I’m thinking rather than just thinking. It just puts it into that third person perspective.” Jake interpreted that by being able to defuse from cognitions and accept emotions, he would “be able to aim towards that end goal or value.” The ability to defuse from cognitions and accept emotions also appeared to positively affect how Jake viewed his reentry to sport: “I have the methods or the means of dealing with the emotional side rather than just winging it and seeing how I go.” Despite these changes in Jake’s approach to the private events surrounding his injury and return to sport, he still demonstrated an unwillingness to accept particular experiences, and engaged in emotion-driven behaviors. For example, Jake stated, “I still haven’t got the physio’s permission to do flips and stuff, but I tried some of them because I was a bit impatient.” Additionally, there was a concern that Jake was still attempting to alter private events instead of accept them, which was reflected in statements such as “I just try to forget about those other worries and just kind of chill out.” Overall, Jake appeared to lack a thorough understanding of the ACT principles taught in sessions, as even he stated, “I’m still learning to use the skills.” We believe that Jake understood the ACT principles taught in sessions at a basic level, but that he was not fully able to implement the skills. This belief may also explain Jake’s assessment scores.

Discussion

The intention of our study was to investigate the experiences of four injured athletes during their rehabilitation from ACL injuries and to examine the potential usefulness of an adapted ACT-based educational intervention in addressing individuals’ adherence to rehabilitation protocols and their general psychological well-being.

The case studies suggested that (a) the injured athletes experienced a multitude of private events immediately following injury, throughout their recoveries, and when approaching full return to sport; (b) the injured athletes typically avoided these private events and engaged in emotion-driven behaviors; (c) an ACT approach adapted for educational purposes could be useful on at least a basic level in assisting injured athletes to accept private events, commit to rehabilitation behaviors, and have some certainty about returning to sport; and (d) more could be done to address the needs of injured athletes beyond the structure of our four-session educational intervention.

The four injured athletes in our study all commented that the experiences of their ACL injuries and recoveries were full of numerous uncomfortable and unwanted private events. There was a general consensus that immediately following the onset of injury, the individuals experienced shock and uncertainty about both what they had done and what would follow. During the rehabilitation phase, the athletes' emotions changed to frustration and boredom surrounding their rehabilitation protocols, slow progress, and limited activities. Finally, all participants mentioned a fear of reinjury and a great desire to avoid having to go through another recovery phase. The one athlete who was recovering from a second ACL injury in as many years illustrated that the experiences differed the second time around. Her experiences were less concerned with anxieties and more concerned with frustration and boredom. The athletes typically reported using avoidance strategies to cope with the private events that arose during their injuries. In addition, these avoidance strategies also appeared to be linked with emotion-driven behaviors, predominately in the form of nonadherence to rehabilitation protocols. These findings not only demonstrate the emotional upheaval that is common during ACL injuries but also the inclination of individuals to employ avoidance-based coping strategies and engage in emotion-driven behaviors during the recovery phase.

Participants reported that the skills learned during the short educational intervention may help them accept private experiences encountered throughout ACL injury rehabilitation and provide them with methods to assist in adhering to rehabilitation protocols. All participants noted that the skills—particularly cognitive defusion and mindfulness—were useful in accepting emotions such as frustration, boredom, and anxiety and that the skills also promoted value-driven behaviors. Our findings tentatively suggest that an ACT-based educational program may assist in the development of committed rehabilitation behaviors and the well-being of injured athletes. Findings from studies on similar mindfulness-acceptance based approaches (Garcia et al., 2004; Watson, 2008) have suggested that ACT (and similar approaches) is an effective method to address the committed behaviors and general well-being of athletes.

Limitations and Future Directions

There are considerable limitations to our research that need to be noted and areas that future research should address to ensure that injured athletes are being appropriately supported. The main limitations of this study were (a) the limited length of the program (affecting ability to thoroughly cover the basic topics) and (b) the educational approach used to communicate the core ACT principles.

First, although two previous research studies have demonstrated that brief mindfulness-acceptance based approaches can be affective with athletic populations

(e.g., De Petrillo et al., 2009; Watson, 2008), they emphasized that greater benefits could be gained from longer programs. We selected a four-session program because of the support from such research, but more so because of the time-scarce lifestyles of athletes. Future research needs to consider a program length that is both clinically meaningful for change but also meets the demands of athletes. In fact, most of the empirically supported mindfulness and acceptance based programs in both the clinical and sport domains are at least double the length of time as our study (e.g., MAC, Gardner & Moore, 2007; MBCT, Segal & Williams, 2002; ACT, Hayes et al., 1999; MBSR, Kabat-Zinn, 2003). The length of our program was likely limiting because we were not able to adequately address all six principles central to the ACT approach. We believe that the four topics that were covered could have been more comprehensively addressed, even before considering the other two neglected principles. In addition, if an athlete misunderstood a concept or skill, there was inadequate time to sufficiently address the misunderstanding. The case of Jake is an example of where greater time was needed to discuss the central concepts of the program. The scattered and inconsistent results on the AAQ-II, MAAS, and SIAS may also be explained by the limited timeframe of the program. Athletes may not have been aware of their avoidance of private events until the commencement of the program. The intervention may have heightened their awareness of such processes, resulting in lower acceptance and mindfulness scores during postintervention data collection. Given additional time for training, the benefits of the skills learned in sessions may have afforded athletes the opportunity to become more accepting and mindful.

Second, the educational approach of the program was also a limitation. Moore (2009) strongly argued that mindfulness-acceptance based approaches are experiential in nature. They require individuals to involve themselves in behavioral tasks that raise uncomfortable and unwanted private events, while employing mindfulness and acceptance skills to endure such experiences in the pursuit of personal values. Based on previous research (e.g., Bernier et al., 2009), our study was educational in structure and could have benefitted by employing more experiential tasks associated with the avoidance of private events related to the athletes' rehabilitations. This limitation may also explain why a number of the statements in the postintervention interviews were focused on skills that *could* be used, rather than skills that *were* being used by the four injured athletes.

We recommend that future research continue to investigate the potential effectiveness of mindfulness-acceptance based approaches to support the needs of injured athletes. The prevalence of emotional upheaval, experiential avoidance, and emotion-driven behaviors within this group provides strong grounds for the use of mindfulness-acceptance based approaches. Future research should adhere to a program length that contributes to meaningful change to the rehabilitation behaviors and general well-being of injured athletes, while at the same time accommodating for their limited time availability. In addition, future research could be extended to focus on the reentry behaviors of injured athletes who are returning to competition, especially considering reinjury anxieties were a common concern among participants in our study. Finally, programs should maintain adherence to all six principles of ACT. The inclusion of all six principles ensures a well-rounded program that fully addresses the theoretical framework of the intervention, thereby enhancing intervention gains.

Conclusion

The present study investigated the effectiveness of an adapted ACT protocol to address the needs of four athletes recovering from ACL injuries. Our program used an educational approach in an attempt to emphasize acceptance of uncomfortable and unwanted private events and the need for value-driven behaviors during rehabilitation. Overall, our study highlighted that during recovery, injured athletes experienced a number of emotions that they are typically unwilling to accept and therefore attempt to avoid. Our four-session educational intervention, although brief, suggested that ACT may be an effective method for educating injured athletes about the usefulness of acceptance and related skills. Overall, mindfulness-acceptance based approaches appear to provide injured athletes with the opportunity to meet the challenges of their recoveries, and allow them to commit to their rehabilitation program and maintain behaviors that support successful reentry to sport.

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