

REDUCING REINJURY ANXIETY
IN ATHLETES: THE USE OF GRATITUDE

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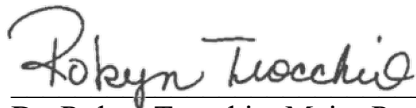
REDUCING REINJURY ANXIETY
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A Thesis for the Degree
Master of Science

by

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ABSTRACT

Sports injuries are inevitable, however, adapting the recovery process to ensure maximal performance when returning to sport is a topic that requires more research. People commonly experience anxiety of reinjury when returning to sport that medical professionals often do not acknowledge when clearing athletes for performance. Therefore, disregarding the psychological component of rehabilitation is neglecting their optimized performance outcome. The purpose of this study was to examine the effects of a one-time gratitude intervention on state gratitude, reinjury anxiety, life and sport satisfaction, and anxiety of returning to sport. Twenty-two injured athletes with at least three years of sport experience took five baseline questionnaires assessing state gratitude, perceived social support, psychological distress, satisfaction with life, and kinesiophobia. After the baseline measurement, athletes completed an online gratitude intervention and then completed the same questionnaires. The intervention included a didactic and an introspective portion allowing participants to write what they were grateful and why via Qualtrics. Results indicated that the gratitude intervention slightly reduced gratitude levels. All other measures were non-significant but showed to trend in the desired direction (decreasing negative affect and increasing positive affect). The gratitude intervention may have brought light to the injury resulting in the worse gratitude scores. Gratitude may be beneficial when used consistently and when implemented in person. Future research should assess an in-person intervention and should include analysis of gender and sport differences.

Chapter I: Introduction

Each year in the United States, an increasing number of people sustain sports-related injuries. Injury is defined as a physical or psychological impairment causing a decrease in performance; it is often sustained in sport, however, is not isolated to that environment (Hsu et al., 2017). Injury can be acute, chronic, physical, or mental, and impacts athletic performance. In the United States, over 3.5 million athletic injuries have been reported that cause both psychological and physical impairments greatly affecting an athlete's present and future (Patel et al., 2017). Common psychological responses to injury are anxiety of reinjury as well as depression, decreased self-esteem, performance decrements, increased pain, isolation, and kinesiophobia, the term used to define reinjury anxiety (Hsu et al., 2017). Reinjury anxiety is an additional common response to injury defined as debilitating or irrational anxiety that physical movements will result in a painful reinjury (Hsu et al., 2017). These psychological responses are commonly experienced when facing a sports injury and, if unaddressed, could elevate and lead to a longer rehabilitation process (Clement, 2015). Injuries are an inevitable component of sport; however, athletes can avoid the negative psychological effects through proper education and training (Yoon & Yoon, 2014). Psychological impairments and other psychological obstacles are common responses to injury as athletes endure a strenuous rehabilitation process when suffering from a severe injury.

Many interventions have been implemented to decrease negative psychological effects amongst athletes. Some of the most common methods included increasing the education of those injured through goal setting and discussions with medical professionals (Hsu et al., 2017), increasing the use of positive self-talk and coping tactics (Swann et al., 2020), and incorporating athletic imagery and relaxation techniques into the athlete's daily life (Yoon & Yoon, 2014).

Ensuring that there is a foundation for solid social support is also important when rehabbing an injured athlete (Hsu et al., 2017). A major fear of returning to sport post-injury is the anxiety of reinjury; the psychological worry of going through the rehabilitation process all over again, exhibiting the pain, and working towards the physical fitness level that was attained before the injury (Hsu et al., 2017). Therefore, healthcare practitioners are seeking other interventions and methods of treatment to combat these negative psychological emotions. The aim of decreasing the levels of reinjury anxiety of returning to sport will help to maximize performance, decrease the risk of reinjury, and increase psychological readiness to return to sport. Thus, understanding the reason why athletes face these anxieties of returning to sport is essential to learn how to combat them. There is a difference between presenting physical readiness such as strength, mobility, and speed, and exhibiting psychological readiness to return to sport. Psychological readiness describes the athletes' individual readiness to return to sport post-injury. Both physical and psychological readiness contribute to the athlete and coexist to maximize performance. Research has demonstrated that athletes who had returned to sport prior to psychological readiness had significantly greater anxieties of reinjury, thus impacting their performance (Olds & Webster, 2021). Therefore, to maximize performance and prioritize the overall health of the athlete, both physical and psychological readiness need to be included in the return to sport.

Returning to sport prematurely is extremely important to understand as it poses a potential risk of reinjury and suggests that athletes face large psychological barriers.

Psychological and physical readiness are the two major components healthcare practitioners consider when clearing the athlete to return to competition. Based on the nature of the injury, there are standardized physical exams of strength, flexibility, mobility, and other sport-specific activities to analyze movement. Conversely, is no one comprehensive definition or any specific

psychological exams, thus revealing the need to implement psychological readiness assessments to ensure that athletes' physical and psychological readiness are cohesive (Monahan, 2018). Demonstrating this phenomenon, research has shown that those who have returned to sport too prematurely had higher rates of joint instability, demonstrating hesitation and lack of psychological readiness (Olds & Webster, 2021). Rehabilitation can be lengthy, depending on the type and severity of the injury. It is deemed "good" to be cleared from rehabilitation early as it appears the athlete has recovered quickly and can return to sport. While certain rehabilitation facilities focus on physical and psychological rehabilitation, the main priority for healthcare practitioners is their physical readiness including meeting the strength guidelines, passing the standardized tests for the injury, and clearing the athlete for athletic performance (Meredith et al., 2020).

Additionally, fear-avoidance is a concept describing the avoidance of activities of movements based on the potential reinjury or pain (Vlaeyen et al., 2016). These fears, combined with increased stress and anxiety, have been shown to negatively impact the kinematic movements in all populations (Glaviano et al., 2018). Several studies have evaluated the concept of fear and fear avoidance and how it contributes to athletic performance specifically. The most common results of the analysis indicate that participants have an elevated fear avoidance post-injury and therefore suffer from decreased confidence, self-esteem, weakness, and anxiety of returning to sport (O'Connor et al., 2021). Excess psychological stress can result in performance decrements amongst athletes by facilitating increased muscle tension and flexibility, altered motor patterns, and therefore, an increased risk of injury (Andersen & Williams, 1988; Cagle et al., 2017). The athletes' motor patterns shift to adjust to the demands and stress placed on them, which in turn, led to performance decrements. Psychologically, pain and fear avoidance are key

inhibitors to success when returning to sport, which in these studies, has been shown to decrease performance and alter motor patterns. Although there have been strides made to ease this transition, researchers and healthcare practitioners must evaluate what psychological interventions can be implemented to decrease these negative effects.

In recent years healthcare providers have implemented more interventions to aid in the transition from rehabilitation to return to sport, examining other methods to increase psychological readiness when returning to sport. The use of gratitude in a rehabilitation and sports injury recovery setting has yet to be thoroughly researched. Gratitude has become more prevalent when analyzing levels of appreciation amongst National Collegiate Athletic Association (NCAA) Division I athletes, however, has primarily focused its' effect on athletes' burnout rates. Gratitude stems from the acknowledgment that something good happened to you, complemented by an appraisal that someone was responsible for it (Cunha et al., 2019). Such feelings of sport and life satisfaction, perceived social support, and overall gratitude affect an athlete's psychological and physical performance. Gratitude is also described as the ability to restructure one's mind to focus on the positives such as life satisfaction, overall well-being, and optimism (Cunha et al., 2019). Such sports injuries trigger many stressors for athletes such as isolation, pain, functional decrements, sociality, and depression, which contribute to the notion of reinjury anxiety (Hsu et al., 2017).

Gratitude can be used by all populations to reduce those negative feelings by highlighting the positivity in one's life and using beneficial approaches to overcome those obstacles. Incorporating this mindset into a rehabilitation setting can be useful for performance, pain levels, and overall attitude. Recent research has been conducted on Division I athletes analyzing their feelings of gratitude, life, and sport satisfaction, burnout, and perceived social support after a 90-

minute intervention (Gabana et al., 2019). The athletes' responses after the intervention greatly varied compared to their answers pre-intervention concluding that gratitude is a useful tool to combat the negative aspects of an athlete's mindset. With the knowledge of this tool and other studies that have implemented the use of gratitude, healthcare practitioners can incorporate this into their rehabilitation to analyze the effects on the athlete when returning to sport.

Purpose

To extend the previous literature, the purpose of this study is to examine the effects of a one-time 60-minute online gratitude intervention on state gratitude, reinjury anxiety, life and sport satisfaction, and anxiety of returning to sport in injured athletes. The current study aimed to provide evidence of the impact of an additional psychological approach (i.e., gratitude intervention) to reduce reinjury anxiety. The use of gratitude was intended to reduce those levels while highlighting the importance of the overall athlete.

Statement of the Problem

Sports injuries are inevitable, however, adapting the recovery process to ensure maximal performance when returning to sport is a topic that requires more research. With the increasing number of sports-related injuries sustained, researchers need to further explore this issue. When examining the process of rehabilitation, depending on the severity of the injury, it can take individuals weeks, months, and often years to fully recover. Professionals trained in physical rehabilitation assess the physical debilitations of the individual such as range of motion, strength, flexibility, and speed. These kinematic measures lack concern for the athlete's psychological readiness. People commonly experience anxiety of reinjury when returning to sport that medical professionals often do not acknowledge when clearing athletes for performance. Therefore, disregarding the psychological component of rehabilitation is neglecting their optimized

performance outcome. Rehabilitation is a multidisciplinary process; interventions and other help can come from athletic trainers, physical therapists, sport psychology professionals, family members, teammates, coaches, etc. to implement such gratitude practices on a daily basis. The most common excuse for lack of practice is perceived lack of time, however, gratitude practices such as lists, writing three good things, and consciously shifting mindsets and perceptions are not time-consuming. They can be completed throughout the day and are aimed to make small changes leading to an overall life alteration. The progressive increase of technology aids in the accessibility of these interventions and practices with the use of the internet and other modes of information to increase the frequency of practice. Not acknowledging the psychological component of rehabilitation does a disservice to the athlete, the team, and the professionals involved in the rehabilitation process.

Chapter II: Review of Literature

The succeeding information is a review of literature that is suitable for the utilization of gratitude as an intervention to reduce the lack of mental readiness presenting as fears and anxieties of returning to sport among injured athletes. The psychological component of athletic performance post-injury has been well established through literature, however, the utilization of gratitude as an intervention to reduce the negative aspects has yet to be evaluated (Andersen & Williams, 1988; DiSanti et al., 2018; Filbay & Ackerman, 2016; Ford et al., 2017; Hsu et al., 2017; Ivarsson et al., 2017; McPherson et al., 2019; Salim, J., & Wadey, R., 2021; Swann et al., 2020). Although research has begun to develop in recent years (Cunha et al., 2019; Salim, J., & Wadey, R., 2021), understanding the effects of this research on the psychological readiness to return to sport is further analyzed in the subsequent chapter. Reviewing the literature will provide a comprehensive understanding of the factors contributing to a lack of mental readiness and fear and anxiety of reinjury among athletes and the use of gratitude aimed to combat those feelings further increasing performance when returning to sport. Topics that are addressed below include: (1) the relevant theoretical frameworks and models addressing the psychological effects of stress and anxiety and how they contribute to injury; (2) fear of reinjury and reinjury anxiety during both the rehabilitation phase and return-to-sport phase of recovery; (3) the effects of gratitude on rehabilitation; and (4) the effects of gratitude and how that contributes to athletic performance.

Sport psychology has recently begun to investigate the psychological factors contributing to reinjury, reinjury anxiety, and readiness to return to sport. With these significant components impacting optimal human performance, the concept of gratitude can be implemented into rehabilitation. Gratitude stems from the recognition that something good happened to you,

accompanied by an appraisal that someone, whether another individual or an impersonal source, such as nature or a divine entity, was responsible for it (Cunha et al., 2019). Dr. Nicole Gabana has been at the forefront of gratitude research analyzing the effects of a one-time gratitude intervention on Division I athletes. Gratitude is considered a positive character trait that can be polished to increase benefits in daily life (Gabana et al., 2019) as it has been associated with positive affect, perceived social support, and physical health. Gratitude is usually seen as a state; an emotion experienced in a moment explained as feeling grateful. However, gratitude may also be described as a trait where an individual has a “grateful” outlook on life emphasizing appreciation and positivity (Lambert et al., 2009). Gratitude has also been found to predict life and sport satisfaction and overall well-being (Gabana et al., 2019) emphasizing the significance of further research on how it impacts athletes when transitioning out of rehabilitation. Researchers have acknowledged and begun to implement some psychological interventions thus far such as positive self-talk and reframing the mindset to interpret one’s problems as positive and an obstacle to overcome, such as seeing it as a challenge (Lambert et al., 2009). Implementing the notion of gratitude as both a state and a trait can help aid in the transition between rehabilitation and the return to sport.

Some of the first known gratitude research studies in sport analyzed the relationships between life and team satisfaction and state gratitude. The study in Taiwan found significant positive relationships between the two indicating the correlation between the two (Chen & Kee, 2008). Chen and Wu (2014) revealed that grateful athletes demonstrated higher levels of self-esteem when exhibiting greater trust toward their coaches illustrating a greater level of trust associated with positive affect. Both state and trait gratitude has been seen to be negatively correlated with athlete burnout indicating the benefits it has on the athletes' performance and

perseverance. Implementing this into the daily life of an athlete with its many benefits can aid in individuals' performance, endurance, and enjoyment.

Although research thus far has explored the relationships between state gratitude and overall athlete well-being, no known research studies have analyzed the effects of gratitude on injured athletes with their return to sport. Gratitude interventions typically include tasks such as making lists of things in life that the individual is grateful for, writing an introspective letter to oneself, or expressing gratitude words towards someone in one's life (Wood et al., 2010). Gratitude lists have been most commonly seen throughout literature as a way to visibly see the quantity of positive aspects in one's life. It has been used to treat depression and anxiety and other mental health disorders showing positive effects with the intervention (Cunha et al., 2019). The effects of writing letters of gratitude have been shown to have positive effects directly after the intervention. Interventions such as listing "three good things" from the day have been readily implemented throughout research demonstrating significant lasting effects on psychological well-being (Seligman et al., 2005). With the increasing level of burnout amongst athletes, transitioning these interventions towards injured athletes can be utilized to analyze the benefits of gratitude interventions on overall mindset and level of burnout as they transition back into sport.

Theoretical Frameworks

Two main theories attempt to explain the psychological reactions resulting from sports injury when returning to performance. The stress-injury model claims that individuals make cognitive appraisals of the environmental demands placed on them, the resources they possess to manage the demands, and the consequences of being successful or unsuccessful (Andersen & Williams, 1988, Ford et al., 2017, & Wiese-Bjornstal et al., 1998). The integrated model explains how

personal factors and situational factors the athletes' cognitive appraisals. This appraisals then affect both the behavioral and emotional responses. These theories and models are further explained and are the foundational basis for this study.

Stress-Injury Model

Andersen and Williams (1988) were the first to analyze the psychosocial factors that contributed to injury, using that information to construct a theoretical framework for the stress-injury relationship. This multifactorial perspective states that the initial component is the cognitive appraisal of the athlete's situation. If the athlete perceives the situation and the demands placed on them as stressful, the response will be consequential to those demands. For instance, if an athlete has been able to complete a single leg squat without losing balance in rehabilitation when performing this skill in front of their teammates, their perceived stress of the situation may increase causing more instability. The cognitive appraisal of the situation has a large impact on the athlete's performance, whether it be positive or negative. The factors associated with the highest levels of injury risk were high levels of negative life stress and strong stress responsivity (Ivarsson et al., 2017). These psychological appraisals of the situation affect an athlete's reaction to the situation while behaving as a form of feedback (Andersen & Williams, 1988). The higher levels of perceived stress that the athlete faces, the more they are at risk for altered patterns of movement, decreased stability and coordination, and a higher risk for injury (Ivarsson et al., 2017).

Andersen and Williams (1988) also highlight the history of the individual's life stressors as significant components regarding the athlete's response to stress. Such factors that can contribute to an athlete's stress response include a recent loss of a loved one, childhood trauma, previous injuries, and models of coping witnessed throughout their upbringing. Children are

greatly impacted by their upbringing so, visualizing different methods of coping, psychological skills used, and common responses to stress are what the child knows and will model as they experience stress of their own. Andersen and Williams (1988) further explain how the individual's personality and ability to manage perceived stress directly impact their response to the stressful situation.

Integrated Model

The integrated model of psychological response to sports injury and rehabilitation process was created to analyze the factors contributing to the responses to sport injury. It is significant when considering how an individual responds to both the injury and the recovery process. The integrated model explains how personal factors and situational factors affect the athletes' cognitive appraisals of the situation which in turn, affect both the behavioral and emotional responses (Wiese-Bjornstal et al., 1998). To apply this to an athletic population Clement and Arvinen-Barrow (2015) conducted structured interviews on eight previously injured athletes examining their cognitive appraisals at two different stages of appraisal: the reaction to rehabilitation phase and the reaction to sport phase. During the reaction to sport phase, the athletes indicated experiencing doubts about their ability to perform resulting in their cognitive appraisals of emotional responses such as nervousness and reinjury anxiety (Clement & Arvinen-Barrow, 2015). The results of this study supported the use of the integrated model to understand how physical and psychosocial factors interact during injury and rehabilitation.

This theory highlights the importance of athletes' cognitive appraisals and how their history plays a large role in their response to injury. Thus, if an athlete has negative coping skills learned through their childhood, socialization, or are inherent, their response to injury and rehabilitation would result in a negative cognitive appraisal. The initial component of the model

acknowledges the contribution of the athlete's unique personal and social factors, suggesting that the behaviors will impact the cognitive appraisal and then the response (Hess, Gnacinski, & Meyer, 2019). This model aims to improve coping strategies, psychological skills, and personal and situational factors to decrease the negative responses to injury (Hess, Gnacinski, & Meyer, 2019), however, this is where the individualization of the athlete comes into play such as past injury, health history, personality factors, role of social support, and motivation.

Fear of Reinjury and Reinjury Anxiety

In addition, with the continually increasing number of sports-related injuries, there is a corresponding increase in both physical and psychological impairments. The recovery process can last from days to years to return to the pre-injury level of performance. Further illuminating this notion, Hsu and colleagues (2017) examined the impact of psychology on the fear of reinjury in athletes and potential interventions to be implemented to reduce those effects. While this article provided multiple causes and interventions such as psychologically informed practices, goal setting, and various coping strategies aiming to reduce the fears and anxieties of reinjury when returning to sport, there are limitations related to the methods of measurements used, background factors, severity of the injury, and level of the sport returning to.

Consequently, a group of studies has highlighted fear and anxiety of reinjury within the athletic population and it was found that with these feelings, athletes faced performance decrements, lack of mental readiness, and decreased levels of self-esteem when returning to sport (Filbay & Ackerman, 2016, Hsu et al., 2017, & McPherson et al., 2019). Previous literature utilized the method of clinical review to analyze the impact of fear of reinjury on rehabilitation outcomes during physical training. The researchers measured fear of reinjury through multiple different questionnaires such as the Emotional Responses of Athletes to Injury Questionnaire

(ERIAQ), the Return to Sport After Serious Injury Questionnaire (RSSIQ), the ACL-Quality of Life (ACL-QoL), the ACL- Return to Sport after Injury questionnaire (ACL-RSI), and the Tampa Scale for Kinesiophobia (TSK) (Hsu et al., 2017). The researchers evaluated how each scale was answered and how those answers contributed to their fear of reinjury. This was then compared to the injured individual's physical performance in the rehabilitation setting to examine how their psychological components corresponded to their physical ability. The researchers suggested multiple different intervention options for reducing the fear of reinjury such as increasing education, goal setting, imagery, positive self-talk, graded exposure, social support, and relaxation. It was found that increasing the knowledge of the individual during their rehabilitation process contributed to the reduction in anxiety when returning to sport. The participants were interviewed before their medical clearance on their feeling of psychological readiness. Some of the main results of the study indicated that both male and female participants experienced a fear of movement and loss of athletic identity through their rehabilitation process. Males reportedly aided their recovery using internal dialogue whereas females utilized their social support as a coping mechanism. These psychological barriers were extremely influential in their return to sport as they experienced similar feelings yet dealt with them in different ways. There are many psychological barriers that athletes face when returning to sport and being aware of them and figuring out how to conquer them is imperative for the continual success of athletes.

Examining the kinematic performance of novice table tennis athletes, Sekiya and Tanaka (2019) assessed their performance when challenged with high psychological pressure. The researchers assessed the movements of the head of the racket and ball movements and measured the grip force. After analysis, they concluded that the higher the pressure exhibited by the individual, the more altered movement patterns they experienced. Both the athletes' front and

back swings decreased in length and speed, and under the increased pressure, experienced increased performance decrements (Sekiya & Tanaka, 2019). The results demonstrated that increased pressure led to decreased performance, despite the athletes altering tactics to adjust throughout. Together, these studies indicate that increased stress and anxiety correlated with pain and fear avoidance, affecting an individual's movement.

Other researchers who have agreed with these findings researched post-Anterior Cruciate Ligament (ACL) reconstruction athletes. This is a specific population of participants, however, ensured reliably with the large sample sizes used. One specific article examined the psychological readiness to return to sport and second ACL injuries (McPherson et al., 2019). This injury is commonly researched when discussing the psychological readiness to return to sport due to the extensive rehabilitation time and severity of the injury. This study assessed 329 patients who returned to sport after ACL surgery; 52 of those sustained a second ACL injury after their return to sport. The participants completed the ACL-RSI about two weeks before their surgery and at their 12-month post-operation check-in. This scale measured confidence level, mental readiness, and risk appraisal. The results of the study indicated that the patients who sustained a second ACL injury had a lower reported psychological readiness score at their 12-month checkup as compared to non-injured patients. It also concluded that younger patients had a lower psychological readiness score than older patients. Understanding how the age of individuals affects their mental readiness is extremely important when analyzing the generalizability of psychological interventions.

Another ACL-injured population was studied within the high school setting. The researchers examined 10 high school athletes who underwent ACL reconstruction surgery (DiSanti et al., 2018). The researchers interviewed athletes with questions focused on their

attitudes and perceived physical and psychological barriers to returning to sport. The participants did report great psychological barriers to returning to sport rather than physical barriers. They conveyed feeling a sense of comparison to others going through the same recovery as them as a psychological barrier to their progression in rehabilitation. These barriers are key components of a lack of readiness to return to sport. It is imperative to address these concerns in the rehabilitation setting to ease the transition for them to reduce the risk of reinjury. Complimenting the results found in this research, another study analyzed activity preferences, lifestyle modifications, and fears of reinjury after ACLR. In this research study, 162 participants were analyzed who had undergone ACLR (ACL reconstruction) within the past 5-20 years (Filbay & Ackerman, 2016). This aimed to assess the long-term effects of this surgery on their overall quality of life, psychological effects post-return to activity, lasting symptoms, and pain levels. They completed the ACL-QOL questionnaire and were ranked and then the top and bottom 15 were asked to have a phone call to further discuss their circumstances. With the average age of the participants in this study equaling 36, the older age could contribute to the need for lifestyle modifications and decreased quality of life. The ACL-QOL questionnaire qualitatively analyzed the individualized interpretations of the participants' lifestyles post-surgery. Due to the extensive length of time post-reconstruction, they were able to reflect on how their lives had changed since the surgery and the modifications that were made. These research studies concluded that fears and anxieties of reinjury were the driving force leading to decreased levels of performance, quality of life, and inability to return to complete sport performance.

Increasing the knowledge of the individual during the athlete's rehabilitation process has been shown to contribute to the reduction in anxiety when returning to sport (Hsu et al., 2017). Hsu and his colleagues examined the impact of psychology on the fear of reinjury in athletes and

potential interventions to be implemented to reduce those effects. Creating goals that are specific, measurable, attainable, relevant, and time-bound (SMART) is imperative in the rehabilitation setting to maximize positive rehab progress and to have a positive experience throughout the process (Swann et al., 2020). Goal setting requires knowledge of the injury, the stage in the recovery process, and communication with a medical professional to ensure that both are on the same page. Participants were randomly assigned to an open or closed goal setting where they set “do-your-best goals, as-well-as-possible goals, SMART goals” or were in the control group with no goals set (Swann et al., 2020). They completed a six-minute walking task which established that the groups that set the goals were those that experienced a greater mental effort compared to the control group. Setting goals that push an individual while ensuring that they can reach them can motivate an athlete throughout the process of recovery.

Several studies have examined the potential of reinjury after returning to sport, highlighting the importance of both physical and mental readiness when ultimately returning to the level of competition (Cheney et al., 2020; Hsu et al., 2017). Despite well-designed rehabilitation programs and physical clearance, the psychological aspect of rehabilitation post-injury is one of the largest determinants of performance after returning to sport. Countless athletes never reach their pre-injury level of athletic performance while others never return to sport altogether, suggesting that there are other factors largely contributing to the process of recovery. Increased professional knowledge of these factors would lead to a more encompassing approach in a rehabilitation setting accounting for both physical and psychological recovery. Through analyzing psychological readiness in patients, it was concluded that both fears of reinjury and motivation to play largely determined their positions of psychological readiness (Vutescu et al., 2021). With a reinjury rate as high as 24%-34% in post-ACLR patients, fear of

secondary injury is one of the largest determinants of panic. Those who exhibit an increased level of fear are less likely to return to sport, incorporating the notion of motivation. Such motivations include self-esteem, self-efficacy, self-potential, and the ability to push oneself. Self-determination theory (SDT) is a widely researched theory that addresses three main components: competence, autonomy, and relatedness highlighting the significance of integrating a personal component into rehabilitation. SDT provides a way to better understand the motivations driving the athlete (Hsu et al., 2017), which specifically can be related to the rehabilitation process. When exhibiting fears and anxieties of reinjury, SDT can be utilized to minimize those by emphasizing other driving factors in the recovery process such as milestones met, goals attained, and desire to return. Taylor and Francis (2016) conducted a systematic review analyzing the predictors of adherence to home-based physical therapies. There was strong evidence in this review indicating that increased levels of motivation, self-esteem, and self-motivation led to increased home-based physical therapy adherence. Such factors within the level of self-determination correlate to increased adherence, signifying the importance of the mental state regarding physical performance.

Reinjury anxiety effects on performance

Consequently, psychosocial barriers are common obstacles that athletes face when returning to sport post-injury. Injury is not only physical; it is emotional, social, and psychological. This article focused on examining the perceptions of rehabilitation and return to sport and how it affected the recovery process. After conducting interviews and questionnaires, the participants reported feeling a sense of comparison to others going through the same recovery as them and a psychological barrier to their progression in rehabilitation. These barriers are key components of lack of readiness to return to sport. It is imperative to address these concerns in

the rehabilitation setting to ease the transition for the athletes to aim to reduce the risk of reinjury. DiSanti et al. (2018) shared the breakdown of the results of this study which indicated common responses for barriers for returning to physical activity as well as positive and negative recovery factors. Increased anxiety can reduce optimal performance despite physical characteristics prepared for execution.

Gratitude

The concept of gratitude has been increasingly popular amongst scientific researchers in recent years analyzing how psychological states can affect performance, rehabilitation, and overall well-being. Modern psychology research suggests that gratitude can play a large role in psychological and physical well-being (Chen & Kee, 2008). Based on a series of self-reported assessments, McCullough et al. (2002) discovered that a disposition of gratitude is positively associated with well-being, positive behavior, social traits, and spirituality indicating a positive impact on long-term well-being. Further studies have shown that there is a linkage between gratitude and well-being that exceeds subjective measures. Researchers have seen that a higher degree of coherence in the rhythmic activity of the heart led to a greater feeling of appreciation in one's life (McCraty & Childre, 2004). With the new gratitude research in the field of gratitude emerging, researchers have begun to further dive into the benefits of analyzing athletic performance and its impact. Adolescent athletes devote a large amount of time to academic studies and sports, thus, discovering ways to make this involvement more positive can enhance their well-being.

Thus, the concept of gratitude highlights the appreciation and positivity in one's life, which, are targeted to reduce the effects of anxiety and stress on an athlete (Gabana et al., 2019). Additionally, further examining the efficacy of gratitude on injured athletes, Salim and Wadey

(2021) examined two groups of participants: an experimental group and a control group. The participants in the experimental group were required to write and share a letter displaying their gratitude with an intended recipient. The athletes in this group were then interviewed as well as their recipients in which it was concluded that the one-time gratitude intervention led to increased growth compared to the control group. These findings highlight the significance of incorporating gratitude into the rehabilitation process to maximize the athlete's physical and mental recovery.

The use of gratitude is further supported by Gabana and her colleagues (2019) when they examined 51 National Collegiate Athletic Association Division I student-athletes' levels of state gratitude, sport and life satisfaction, burnout rate, and perceived support. After the gratitude intervention was completed to these athletes, it was concluded that there were increases in levels of sport and life satisfaction while concurrently decreasing levels of distress and burnout. Furthermore, after the gratitude intervention workshop, the athletes scored higher on individual measures of well-being and lower on measures of ill-being when compared to their initial baseline scores (Gabana et al., 2019). Together, these studies indicate the benefits of gratitude on both psychological and physical health and emphasize the importance of furthering the research within this field to decrease fears and anxieties of reinjury when returning to sport. To date, published research on gratitude in the field of sport has engaged quantitative methods to explore connections between gratitude and positive athletic performance. Many studies have analyzed the effects of gratitude on adolescent athletes discovering that gratitude had a positive impact on life and sport satisfaction and a negative impact on athletic burnout (Chen & Kee, 2008). Existing research on the association between gratitude and sport indicates that gratitude is a personal construct; Chen (2013) discovered that the relationship between gratitude and well-

being in high school-aged athletes was partly facilitated by perceived support such as teammates and coaches. However, research on the benefits of gratitude for elite athletes has not been readily investigated. Chen and Chang (2014) were the first researchers to truly analyze the effects of gratitude on performance in the elite athletic population. They investigated the directionality between gratitude and burnout among adolescent Taiwanese athletes. The study discovered that experiences of burnout had a negative impact on gratitude further increasing over time. This suggests that negative feelings of sport and life satisfaction do not discriminate between age or level of sport.

Research question

Does a one-time online 60-minute gratitude intervention impact injured athletes' levels of state gratitude, well-being, and reinjury anxiety?

Hypotheses

H1: A one-time online 60-minute gratitude intervention will increase state gratitude and well-being (e.g., life and sport satisfaction) pre-to-post intervention.

H2: The gratitude intervention will decrease feelings of psychological distress and kinesiophobia (pre-to-post intervention).

Definition of terms

- i. Athlete- traditional athlete, a person who participates in competitive sports intending to return (Cohen et al., 2018).
- ii. Gratitude- gratitude stems from the recognition that something good happened to you, accompanied by an appraisal that someone, whether another individual or an impersonal source, such as nature or a divine entity, was responsible for it (Cunha et al., 2019).
- iii. Injury- a physical and psychological impairment causing decreased performance

- iv. Psychological stress: “A 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 well-being” (Lazarus & Folkman, 1984, p. 141)
- v. Physical Stress: The physical fatigue induced during training and/or competition (Kellmann & Beckmann, 2018).
- vi. Reinjury anxiety- reinjury anxiety is more of a negative thought or worry of the consequences of injury (e.g., additional surgery and more time in rehabilitation) (Hsu et al., 2017)
- vii. Stress: “a physical, mental or emotional, demand, which tends to disturb the homeostasis of the body” (Bali, 2015, p. 92)

Independent and dependent variables

- i. Independent variables: one-time online 60-minute gratitude intervention
- ii. Dependent variables: state gratitude, satisfaction with life and sport, and kinesiophobia

Chapter III: Methods

Participants

The study consisted of 30 participants, however, only 22 were analyzed due to incomplete questionnaires. A total of 22 injured participants who were returning to their competitive sport participated in the current study. Participants included both males ($n = 7$) and females ($n = 15$) who competed in a variety of sports at different levels (see Table 1). Thus, the average age of the participants was 22.09 ($SD = 6.69$). Participants sustained a sports-related injury that restricted them from practice for at least one month. In addition, participants were currently working through their recovery in rehabilitation. The participants were over the age of 18 and have practiced their sport for at least three years, hence the competitive level. The participants were recruited by the researcher from various rehabilitation facilities within the United States, internally through Texas Christian University, and through personal connections. The gratitude intervention took place 2-4 weeks prior to their return to sport to examine the participants' psychological states in a pre-post analysis. Participants were excluded from the study if they were below the age of 18 or were not suffering from a current injury.

Table 1*Demographics*

	Mean ± SD
Age (y)	22.09 ± 6.69
	N (%)
Sex	
Female	15 (68.2%)
Male	7 (31.8%)
Race/Ethnicity	
White/Non-Hispanic	16 (72.7%)
Hispanic/Latino	4 (18.2%)
Two or more races	2 (9.1%)
Sport	
Soccer	4 (18.2%)
Diving	5 (22.7%)
Tennis	2 (9.1%)
Baseball	2 (9.1%)
Lacrosse	2 (9.1%)
Runner	2 (9.1%)
Exerciser	1 (4.5%)
Cycling	1 (4.5%)
Swimming	1 (4.5%)
Gymnastics	1 (4.5%)
Sport Level	4 (18.2%)
Recreational	2 (9.1%)
Club	15 (68.1%)
Collegiate	1 (4.5%)
Professional	

Measures

Participants took each of the following questionnaires 24-72 hours prior to the intervention (part 1) and immediately following the online gratitude intervention (part 2).

Informed Consent

The informed consent form was provided by the researcher prior to the intervention to inform the participants of the purpose of the study and what their expectations were. This form also detailed the participants' legal rights to terminate their participation at any point in the study. This included their right to anonymity. The informed consent was the first form they completed to continue their participation in the research or opt out of the study.

Demographic Questionnaire

The next form the participants completed is the demographic questionnaire which discerns the participant-specific information such as age, race/ethnicity, sport played, years of experience, occupation, annual income, injury history, playing status/classification, etc. The questionnaire also asked participants to answer additional questions, such as their anticipated time in rehabilitation, how they acquired their injury, and location of residence.

Psychological Distress

To measure the participants' level of psychological distress, the Behavioral Symptom Inventory-18 (BSI-18; Derogatis, 2001) was provided to the participants to quantify psychological distress. This questionnaire contains three subscales (anxiety, somatization, and depressive symptoms) with 18 different Likert items ranging from 0 (not at all) to 4 (very much). This questionnaire has been readily used throughout research to analyze psychological distress symptoms and has been seen to be both valid and reliable (Franke et al., 2011; Meachen et al.,

2008; & Recklitis et al., 2017). The reliability of the three scales was good: Somatization $\alpha=0.79$, Depression $\alpha=0.84$, Anxiety $\alpha=0.84$, and GSI $\alpha=0.91$ (Franke et al., 2011).

Perceived Social Support

The Perceived Available Support in Sport Questionnaire (PASS-Q; Freeman et al., 2011) was provided to the participants to measure their level of perceived social support. This questionnaire analyzes four subscales of support such as Emotional, Informational, Tangible, and Esteem support with Likert type items ranging from 0 (not at all) to 4 (extremely). Researchers have correlated high levels of perceived social support with decreased levels of athlete burnout while increasing levels of self-esteem (Freeman, Coffee, & Rees, 2011). Internal validity (Cronbach's $\alpha = .69$ to $.87$) and test-retest consistencies ($.73$ to $.84$) were psychometrically thorough. Researchers have reported moderate ($r = .40$, $p < .05$) to high ($r = .84$, $p < .05$) correlations between perceived available support. The organization of this scale has been validated to evaluate perceived available support within sport. Researchers stated that all four components of the PASS-Q exhibited sound models (Freeman et al., 2011) with the alpha coefficient for the sample being $.85$.

Life and Sport Satisfaction

To quantify the participants' level of life and sport satisfaction, the researchers provided the Satisfaction with Life Scale (SWLS; Diener et al., 1985) which measures five different items. The questionnaire quantified the participants' responses using a rating scale of 1 (strongly disagree) to 7 (strongly agree). The Likert type scale correlates with other comparable units of measure when assessing overall well-being (Gabana et al., 2018). The initial SWLS determined promising properties such as high reliability and internal consistency (Diener et al., 1985), however, this research utilizes the amended scale completed (Diener et al., 2006).

Tampa Scale of Kinesiophobia

The Tampa Scale of Kinesiophobia (TSK) aimed to analyze the reinjury anxiety and fear of movement amongst individuals suffering from chronic pain (Hsu et al., 2017). However, this scale was amended and has more recently been integrated into acutely injured populations (Goldberg et al., 2018; Trigsted et al., 2018; & Woby et al., 2005). This Likert type scale consists of 11 questions with responses ranging from 1 (strongly disagree) to 4 (strongly agree). The aspects of this scale were compared to the original; both demonstrating sound internal consistency (TSK: $\alpha = 0.76$; TSK-11: $\alpha = 0.79$), test-retest reliability (TSK: ICC=0.82, SEM=3.16; TSK-11: ICC=0.81, SEM=2.54), responsiveness (TSK: SRM=-1.19; TSK-11: SRM=-1.11).

State Gratitude

To measure the participants' state gratitude, the Gratitude Questionnaire (GQ-6) was completed by participants (McCullough et al., 2002). This questionnaire is comprised of six different Likert type statements that address the participants' current interpretation and feelings towards their feelings of gratitude within their life. The scale of scoring these descriptors ranges from 1 (strongly disagree) to 7 (strongly agree) and has been demonstrated to have high internal consistency and validity when examined in adults and adolescent participants (Gabana et al., 2019). Researchers discovered the GQ-6 to be interrelated with other gratitude assessments including the Gratitude Adjective Checklist (GAC; McCullough et al., 2002), which quantified a Pearson r of .75. Preceding research has established this measure to be both reliable and valid (e.g., Froh et al., 2011; McCullough, Tsang, & Emmons, 2004). The alpha for the current sample was .85.

Procedure

Upon Institutional Review Board approval, researchers recruited injured athletes to partake in a 60-minute online gratitude workshop via Qualtrics. Before any data collection, all participants completed an informed consent. This intervention was an individual session during the chosen time of the participant. Prior to the intervention (part 1), researchers sent the participants a link consisting of the various questionnaires: demographic questionnaire, the BSI-18, GAC, SWLS, and PASS-Q all for baseline measurements (24-72 hours before).

Gratitude Intervention

The primary researcher recorded the intervention consisting of three different components: didactic, a gratitude introspective portion, and a discussion/debrief in which the participant partook in. The recorded intervention was embedded into Qualtrics not allowing the participants to continue without completing each portion of the intervention. The first component of the intervention is the didactic component. The didactic portion of the workshop included an introduction to the overall concept of gratitude, incorporating introspective and thought-provoking questions along with examples. The participants listened to the pre-recorded information prior to moving on to the next element.

The next portion of the workshop included the introspective aspect. The concept of redemptive gratitude (e.g., gratitude arising from the positive aspects of a stressful experience or acknowledging positive aspects of a stressful experience) was explained (approximately 10 minutes). Participants were then provided the prompt to list out aspects of their lives for which they are grateful for. They were instructed to take 10 minutes to complete this aspect of the intervention before moving on but did not have a time limit. The next portion consisted of “the why” component in which the participants wrote why they listed what they were grateful for in

the previous portion, delving deeper into the meaning. After that, they entered into the self-reflection portion of the intervention where they read each of the things they wrote and truly comprehend this information. The applied portion came next in which they listened to another pre-recorded video detailing how this can be applied to their daily life and how they can continue this through rehab and into the RTS process. Last is the take aways in which they had the option to download a living with gratitude document as a refresher to what they did during the intervention. Qualtrics provided an open text box in which the participants constructed their individualized responses. After the time is up and this portion of the workshop is complete, the participants returned to the primary researcher's recorded intervention where they reflected on their experience and overall levels of gratitude and appreciation after the tasks. They listened to another pre-recorded debrief statement and were offered methods to adhere to these practices throughout daily life. Prior to the reflection, the researcher highlighted the importance of confidentiality, a nonjudgmental attitude, and open communication to ensure comfortability and success in the workshop.

The last component of the workshop consisted of a discussion of how the participants can apply these aspects in their daily lives after the workshop terminates. They had the opportunity to think within themselves to brainstorm ways to incorporate these methods into their routine to continue to receive the benefits. The participants had the ability download a Living Gratitude worksheet to which they can refer as needed that was sent to them with the follow-up questionnaires link. Immediately, after the workshop was complete, the participants were then sent the follow-up questionnaires by the researcher (part 2) so that their gratitude and other levels could be analyzed by the researchers before and immediately after the intervention (pre-to-post).

The entire intervention lasted approximately 45 minutes to one hour depending on the individual's pace and was completed anywhere of the participant's choosing.

Data Analysis

After all data were collected, all variables were analyzed using IBM's Statistical Package for Social Sciences Version 29 (SPSS). Demographic information was analyzed with descriptive statistics to calculate means and standard deviations. Paired sample t-tests were calculated to analyze pre-to-post intervention scores for all subsequent questionnaires GQ-6, BSI-18, PASS-Q, SWLS, and TSK-11.

Chapter IV: Results

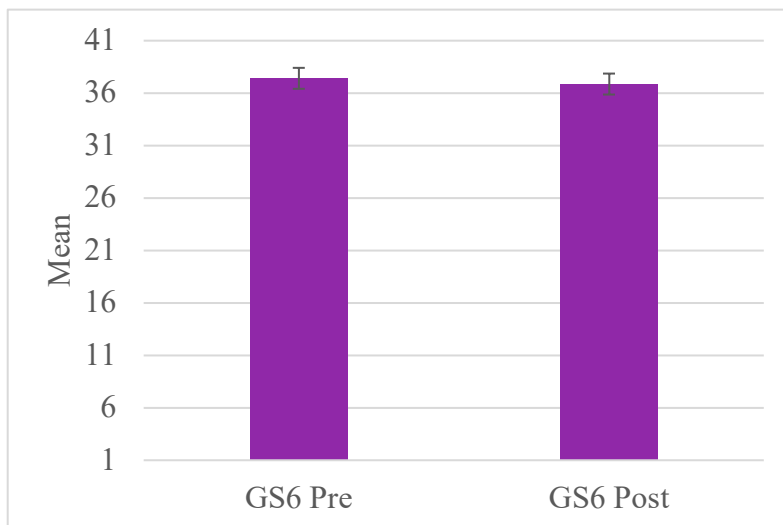
GQ-6 Questionnaire

The GQ-6 questionnaire assessed the current levels of state gratitude the participants felt before and after the intervention. It was hypothesized that participants would have higher ratings on the GQ-6 after the intervention compared to the initial baseline measure.

A paired sample t-test was calculated examining the pre-to-post levels of state gratitude. The mean of the pre-intervention scores was 37.41 ($SD = 3.86$) and the mean in the post-intervention was 36.86 ($SD = 4.68$). A non-significant difference was found between the two time points ($t(22) = 0.425, p = 0.625, d = 0.09$; see figure 1) with post scores being lower than the pre-intervention.

Figure 1

Mean Gratitude-6 scores Pre-to-Post Intervention.



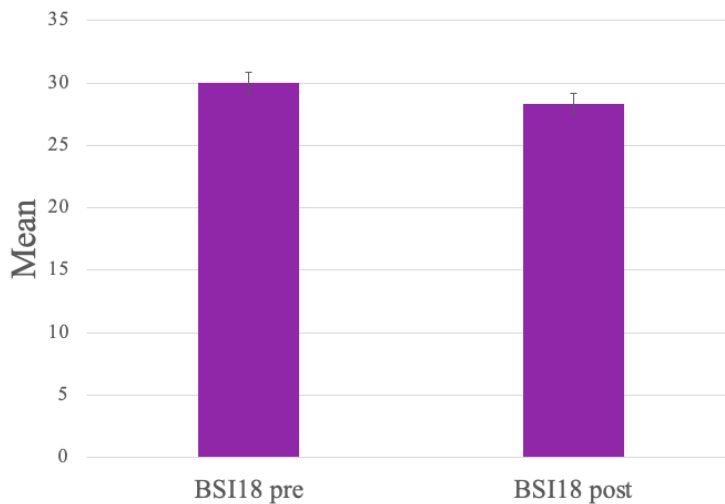
BSI-18 Questionnaire

The BSI-18 questionnaire was used to measure participants levels of perceived psychological distress. It was hypothesized that participants would report lower levels of psychological distress post-intervention as compared to their baseline measure.

A paired sample t-test was calculated examining pre-to-post levels of psychological distress. The mean of the pre-intervention scores was 30.00 ($SD = 12.99$) and the mean in the post-intervention was 28.32 ($SD = 12.88$). A non-significant difference was found between the two time points ($t(22) = 0.39, p = 0.70, d = 0.08$; see figure 2).

Figure 2

Mean BSI-18 scores Pre-to-Post Intervention.



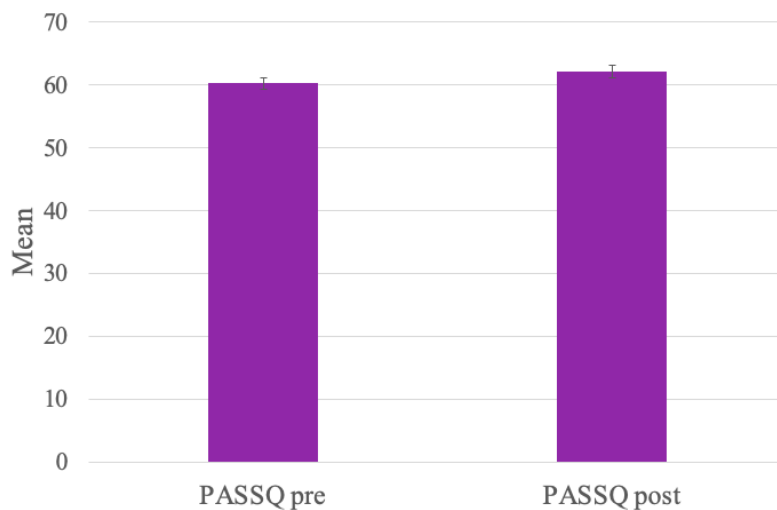
PASS-Q Questionnaire

The PASS-Q questionnaire was used to measure participants levels of perceived available social support in sport. It was hypothesized that participants would report higher levels of perceived available social support in sport post-intervention as compared to their baseline measure.

A paired sample t-test was calculated examining pre-to-post levels of perceived social support. The mean of the pre-intervention scores was 60.27 ($SD = 13.85$) and the mean in the post-intervention was 62.18 ($SD = 15.87$). A non-significant difference was found between the two time points ($t(22) = -0.42, p = 0.68, d = -0.09$; see figure 3).

Figure 3

Mean PASS-Q score Pre-to-Post Intervention.



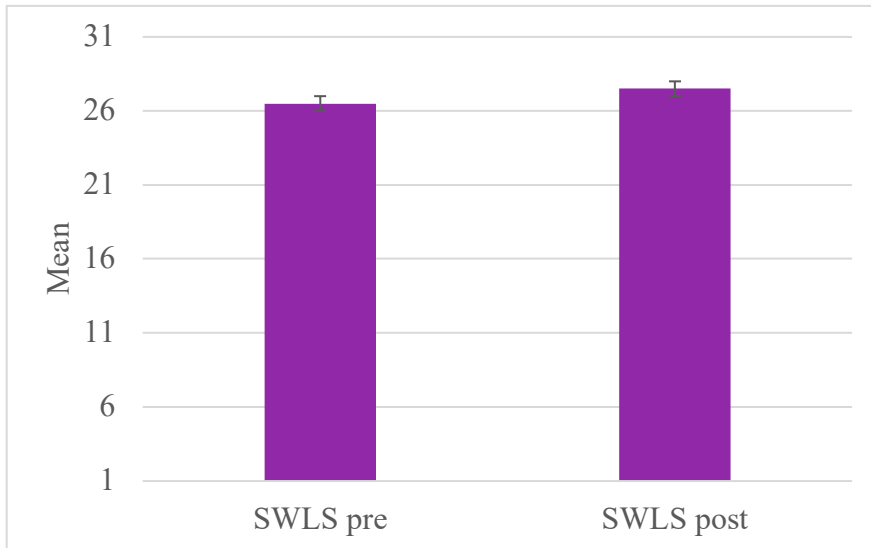
SWLS Questionnaire

The SWLS questionnaire was used to measure participants levels of satisfaction with life. It was hypothesized that participants would report higher levels of satisfaction with life post-intervention as compared to their baseline measure.

A paired sample t-test was calculated examining pre-to-post levels of satisfaction with life. The mean of the pre-intervention scores was 26.50 ($SD = 5.87$) and the mean in the post-intervention was 27.50 ($SD = 6.27$). A non-significant difference was found between the two time points ($t(22) = -0.54, p = 0.60, d = -0.12$; see figure 4).

Figure 4

Mean SWLS scores Pre-to-Post Intervention.



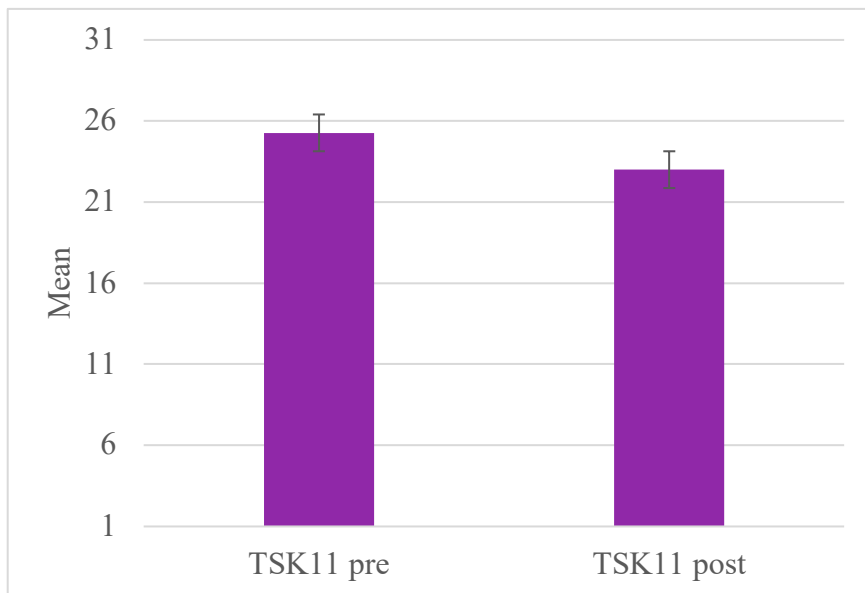
TSK-11 Questionnaire

The TSK-11 questionnaire was used to measure participants levels of kinesiophobia. It was hypothesized that participants would report lower levels of kinesiophobia post-intervention as compared to their baseline measure.

A paired sample t-test was calculated examining pre-to-post levels of kinesiophobia. The mean of the pre-intervention scores was 25.27 ($SD = 4.15$) and the mean in the post-intervention was 23.00 ($SD = 5.90$). A non-significant difference was found between the two time points ($t(22) = 1.37, p = 0.19, d = 0.29$; see figure 5).

Figure 5

Mean TSK-11 scores Pre-to- Post Intervention.



Chapter V: Discussion

The purpose of this study was to evaluate the effects of a one-time online individual gratitude intervention on state gratitude, reinjury anxiety, life and sport satisfaction, and anxiety of returning to sport. The results indicated that this gratitude intervention did non-significantly reduce symptoms of psychological distress or kinesiophobia, however, did concurrently increase levels of perceived available social support and satisfaction with life. Additionally, results indicated that participants reported non-significant slight decreased levels of state gratitude post-intervention as compared to baseline measures.

Gratitude

In contradiction to the initial hypotheses, there was a non-significant difference in gratitude pre-to-post intervention, which was measured using the GQ-6 (34.41 ± 3.86 vs. 36.86 ± 4.68). This indicates that the utilization of an online, self-reported questionnaire did not significantly improve gratitude levels when completed independently. Some explanations for this result include a lack of self-awareness and bringing attention to the injury itself. When reflecting on other aspects of the life one is grateful for, bringing attention to the injury during this intervention may have caused the decrease in state gratitude immediately post-intervention. Another explanation for the results could include the participant not completely being committed to the process; gratitude is a difficult state to attain, therefore the discrepancy in the results.

Gabana and colleagues (2019) have continued to progress research on gratitude aiming to understand how it can aid in the struggles of mental health. Not only has state gratitude been correlated with higher optimism, life satisfaction, prosocial behavior, social support, and lower negative affect (Froh et al., 2008), but trait gratitude has also been found to predict psychological well-being and life satisfaction. Similar to Gabana's findings, the current study found decreases

in psychological distress with concurrent increases in perceived social support and satisfaction with life. However, the athletes in Gabana's study found significant increases in gratitude levels post-intervention, which does not align with the findings in the current study. Furthering these findings, more research has been done analyzing the effects of gratitude to promote sport-injury related growth and discovered that by writing letters to an intended recipient, gratitude, and positive growth dimension (relating to others) were positively impacted (Salim & Wadey, 2019). With the implementation of technology and an all-online intervention, the full experience of the intervention may not have been as impactful as it was done initially, a potential reason as to why the results indicated decreased gratitude levels.

In accordance with this, Allen (2018) explained that there are three reasons as to why gratitude is so difficult for certain people, of which one potential reason may explain why the results did not align with Gabana's previous research. The first reason is genetics; genetics may help explain why some people find it easier to feel and express gratitude than others. Perhaps the strongest evidence that supports this genetic gratitude foundation for gratitude stems from a study examining twins. Steger and his colleagues (2007) found that identical twins, who effectively have the exact same DNA, had more similar self-reported levels of gratitude than fraternal twins, who only share 50 percent of their DNA. These findings suggest there may be a genetic component to gratitude. Thus, research examining state versus trait gratitude would be beneficial to understand if gratitude can be learned or if it is innate in a human, and how that affects interventions such as this. Many other studies have investigated what particular genes may underlie an individual's grateful (or less grateful) disposition (Algoe et al., 2014; Allen et al., 2018; Kogan et al., 2011). One gene is CD38 which is involved in the secretion of the neuropeptide oxytocin. Algoe and colleagues (2014) found that the differences in this gene were

significantly associated with the frequency and quality of various expressions of gratitude toward a romantic partner. This knowledge can help researchers understand how gratitude differs based on each aspect of life; one may encompass gratitude for one aspect of their life but not another, which would affect how they perceived the intervention.

Additionally, Allen (2018) indicated the final point why gratitude is so difficult to attain is due to personality discrepancies. Genetics and individual brains are not all-encompassing; different personality factors also act as barriers to gratitude. Narcissism, materialism, and envy even cause people's gratitude to degrade over time. Analyzing undergraduate students, researchers found that those with higher levels of narcissism, along with materialism, envy, and cynicism, were less grateful after two months, even after controlling for their levels of gratitude at the initial part of the study (Solom et al., 2017). The influence of personality and other individualized factors greatly impact responses: how they interpreted the information, the location of their completion, the time of day, and how they felt about their day, all explained through the integrated model (Hess et al., 2019). Another factor that may have contributed to the decrease in gratitude levels is the highlighting of the injury itself. The intervention encouraged participants to analyze various parts of their lives, which in turn, could have reminded them about their injury, therefore decreasing their levels of gratitude.

Reinjury Anxiety

Reinjury anxiety is a common response to injury, especially when returning to a high level of competitive sport. Many researchers have aimed to combat this issue by incorporating various psychological practices such as progressive muscle relaxation, imagery, various coping skills, meditation, and more, however, few researchers have highlighted the use of gratitude when coping with reinjury anxiety. Salim and Wadey (2019) explored the efficacy of a gratitude

intervention (in-person visit) intending to promote sport-injury related growth. After writing a gratitude letter and sharing it with the intended recipient, similar to Gabana's study design (2019), findings revealed a significant difference between the experimental control group over time (relating to others). Understanding the differences with in-person contact, the current online component of the research study could have been a barrier as to why there was a non-significant difference in levels of kinesiophobia.

It was hypothesized the gratitude intervention would decrease levels of reinjury anxiety, which was measured utilizing the TSK-11. Interestingly, there was a non-significant difference found between the pre-to-post measurements of kinesiophobia (25.27 ± 4.15 vs. 23.00 ± 5.9). This indicates that a one-time, online, individualized gratitude intervention may not be the best psychological tool to combat the negative effects and perceptions of rehabilitation. These results are consistent with previous research indicating that gratitude is difficult to attain and therefore may be impacted by various factors such as personality, technology, and individual differences (Allen, 2018). Recently, Tomczyk et al. (2022) found that dispositional gratitude was positively correlated with well-being and was negatively correlated with anxiety and depression in women. More specifically, women with heightened depressive symptoms who were more grateful (compared to those who were less grateful) were more accepting of their condition, which was related to increased well-being and decreased feelings of anxiety and depression. Therefore, state gratitude in the current moment may not influence reinjury anxiety, however, may impact overall dispositional gratitude, thus impacting the responses in the post-intervention. Those who experience lower levels of dispositional gratitude may not be as affected by the intervention.

Concurrently, different injuries and different competitive levels provide different recovery experiences. Therefore, the rehabilitation experience can greatly differ from individual

to individual. The integrated model of psychosocial response to sport injury and rehabilitation further explains the variety of experiences after suffering from an injury. The integrated model explains how situational factors and personal factors affect the athletes' cognitive appraisals of the situation which then, affect both the emotional and behavioral responses (Wiese-Bjornstal et al., 1998). Understanding how the integrated model can be applied to the injured population, the type of injury, severity, location, how it was sustained, individual response to injury, environmental factors, personal factors, and more all contribute to the response to the questionnaires. Therefore, providing context as to a potential reason as to why there was not a significance found in the change from pre-to-post-intervention.

Perceived Support

Supporting the initial hypothesis, the participants' perceived available support increased pre-to-post intervention. It was originally hypothesized that this intervention would increase feelings of perceived social support, making participants both indicate and reflect on parts of their lives that they are grateful for. In the present study, a non-significant increase in perceived social support was found after analyzing the results. (60.27 ± 13.85 vs. 62.18 ± 15.87). This small deviation in pre-to-post-intervention could have resulted from the average age of the participant (22 ± 6.69), in which the majority of the participants reported to current students in undergraduate-level education. Mahmoud et al. (2015) examined the relationships between coping, negative thinking, life satisfaction, social support, and demographics with the anxiety of college-aged students. Findings suggested that negative thinking was the strongest predictor of both maladaptive coping and anxiety and that life satisfaction was enhanced by perceived social support. The participants showed high levels of perceived social support and perceived social support which was found to be an important positive predictor of subjective well-being, in

accordance with the results found in the current study. In conclusion, these findings reconfirm the importance of perceived social support as a predictor of subjective well-being among youth. This could be a factor as to why the results showed an increase in the average PASS-Q score post-intervention.

Additional research studies confirm that perceived social support is an indicator of reduced negative affect. Zhou et al., in 2013, perceived social support significantly moderated the influence of perfectionism upon depression/anxiety. Further supporting the findings in the current study, these results indicate that perceived social support may have a protective effect in preventing perfectionists from experiencing depression and anxiety, which is extremely common among athletes. Gabana and colleagues (2019) furthered this point after conducting research on college-aged student-athletes at eight NCAA Division I and NCAA Division III institutions. The results of this research indicated gratitude was negatively correlated with burnout and positively correlated with sport satisfaction (Gabana et al., 2019), supporting the findings in the current study. This suggests that athletes who reported more general gratitude concurrently experienced lower levels of athletic burnout and increased levels of satisfaction within their college sport experience. Perceived social support was found to be a mediator in both relationships, demonstrating the large role it has within the athletic population. Thus, the influence of this current research study and the role that perceived social support has on young athletes.

Psychological Distress

Another main component of the initial research question was if the intervention would decrease symptoms of psychological distress. To measure levels of psychological distress, the BSI-18 was utilized. Although the difference pre-to-post intervention was not significant, there was a decrease in symptoms of psychological distress after the intervention (30.00 ± 12.99 vs.

28.32 ± 12.88). It was hypothesized that the participants' scores would be significantly lower after the intervention, however, the results accept the null hypothesis. There has been extensive research completed on the role of psychological distress on athletes and research has shown that many factors contribute to symptoms. Symptoms such as quality of sleep, current pain level, time of year/season, disease, quality of life, and overall personality contribute largely to symptoms of psychological distress. Ng and Wong (2012) support these factors with their study examining the cross-sectional mediating role of sleep in the relationship with anxiety and depression in patients with chronic pain. Results of multiple regression analyses generated a modest mediating effect for sleep on the gratitude–depression link whereas a stronger mediating effect was found for sleep on the gratitude–anxiety link. This demonstrates how much of the effect of gratitude on depression was direct whereas sleep exercised a stronger mediating effect on the gratitude–anxiety link (Ng & Wong, 2013). Therefore, the role of sleep plays a large role in the negative symptoms of anxiety. Since this research study did not include any data on sleep, a rough night of sleep could have greatly impacted the results reported and therefore would be an interesting future study.

Life Satisfaction

Satisfaction with life is a concept that has been readily researched through various avenues such as mental state, disease progression, overall mental health, living environment, and relationship status, however, is difficult to fully understand due to its everchanging nature. Gabana (2019) utilized this questionnaire in her study design because Chen et al. (2015) demonstrated a positive relationship between gratitude and life satisfaction, further demonstrating a positive correlation. Sport satisfaction was seen to be significantly higher immediately following the gratitude intervention; however, the significance of this effect did not

last over time (Gabana, 2019). It would be worthwhile to explore whether an ongoing gratitude series with athletes could produce longer-lasting effects on sport satisfaction in comparison to a one-time workshop. Moreover, in this study specifically, satisfaction with life and sport was measured through the SWLS. The initial research hypothesis predicted that satisfaction with life and sport would increase post-gratitude intervention due to the idea that it would surface aspects of one's life that they are grateful for. Although it was not a significant change, there was an increase in satisfaction with life and sport post gratitude intervention (26.50 ± 5.87 vs. 27.50 ± 6.27). Previous studies have shown that various barriers impact overall life satisfaction such as self-efficacy, career status, perceived barriers, income, health status, perceived social support, medication, and life meaning (Duffy et al., 2013; Jaensch et al., 2015; Riddick, 1985). To further understand life satisfaction across the lifespan, two large-scale, nationally representative panel studies (the German Socioeconomic Panel Study and the British Household Panel Study) were used to assess changes in life satisfaction across the lifespan. The cross-sectional and longitudinal features of these studies were used to isolate various age-related changes from confounding factors including cohort and instrumentation effects (Baird et al., 2010). Although projected satisfaction trajectories varied slightly across studies, two findings consistently emerged. Foremost, both studies show that life satisfaction does not decline over much of adulthood. Additionally, it was shown that there is a steep decline in life satisfaction among those older than the age of 70. Furthermore, age plays a large role in life satisfaction and could therefore be a large factor contributing to overall life satisfaction. As most participants in the study were college-aged, their perceived life satisfaction could have been skewed.

Injury greatly impacts quality of life; based on the severity, can alter independence, movement, function, and can potentially last a lifetime. According to the self-determination

theory, individuals need to have three components attained to maintain self-efficacy: competence, autonomy, and relatedness (Deci & Ryan, 2012). When exhibiting reinjury anxiety, SDT can be applied to reduce those negative symptoms by accenting other motivating factors in the recovery process. Minzlaff et al. (2018) analyzed participants who had undergone arthroscopic anterior cruciate ligament (ACL) reconstructions reported measures of life satisfaction at various time points in their rehabilitation (day before surgery, 6 and 12 weeks, and 6, 12, and 24 months postoperatively). The results of this study revealed that patients' satisfaction with health significantly increased, their individual health values increased, and their functional outcomes improved postoperatively. Patients reported that their general life satisfaction was impaired during the early postoperative course, however, returned to preoperative values when assessed after two years. Knowing how impactful injury is on quality of life, more research should be completed on various ways to ease the load onto these already negatively affected individuals.

Based on the contradictory results of the study with previous research, it may be that gratitude is not a state that can be achieved online. Technology tends to bring increased stress with notifications of work or school and other tasks that may arise, in turn distracting the individual. It is important to understand the potential risks and work to combat those through various forms of practicing this skill.

Limitations and Future Research

This study does not come without its own limitations, so caution should be used when generalizing the results of this study to other populations. This is an initial study analyzing the effects of a one-time, online gratitude intervention on reinjury anxiety and perceptions of rehabilitation, and future research should examine other methods of evaluating the effects of

gratitude on anxiety and performance. Alternative measures such as specific strength testing before and after or heart rate could be used to evaluate the effects of gratitude. Also, the present study examines the effects of gratitude acutely where the participants experienced the gratitude intervention for just one, 60-minute interval. This one-time session was a pre-scripted, pre-recorded intervention designed by the researchers. With the pre-scripted and pre-recorded intervention, some participants may not have enjoyed the intervention as much as others. Technology is a large factor; some participants may have preferred to complete the intervention in person, rather than typing it from the location of their choosing. By having participants choose their own location, it could have impacted their responses based on their surroundings and the multitude of potential distractions. There is a possibility that a one-time, online gratitude intervention did not have as great of an effect as it could have if used for an extended period of time, or if the intervention could have a greater initial effect and lose its effectiveness over time.

This study being solely online poses a limitation in itself. Self-reported questionnaires allow for potential reporter bias. People are often biased when they report on their own experiences. For example, many individuals are either consciously or unconsciously influenced by "social desirability." That is, they are more likely to report experiences that are considered to be socially acceptable or preferred (Salters-Pedneault, 2022). Another consideration in using self-report questionnaires is the clarity of the items, which brings the risk of obtaining various interpretations of the items along with the lack of flexibility, especially with fixed-choice questions. Asking the participants to rate a statement gives them limited ability to express themselves and their feelings (Demetriou et al., 2015). When utilizing self-reported, self-assessed questionnaires, other factors play a large role, such as time of day, individual perceptions, self-awareness, location, and other life factors, all impacting responses. Because of

this, participants may have had their attention elsewhere, potentially influencing their responses. Future research should revisit this study design and examine the effects of gratitude on reinjury anxiety when participants can take the questionnaires in person with the researcher and when there is a quantitative measure included to examine the effects. Additionally, future research should consider utilizing a qualitative approach to gain a more in-depth understanding.

Continuing with the limitations of this study, another limitation is that this study had a small sample size. This limits the generalizability of this study, so future research should examine gender differences for the effects of gratitude on athletes' perceptions of rehabilitation focusing on the aspect of gratitude. Females tend to experience stress and anxiety significantly differently than males, thus the benefits of incorporating gratitude may be different in males and gender differences should be examined. This study also had an inclusion criterion set to a minimum of 18 years of age. This low threshold may have impacted the psychological skill set that individuals have been exposed to at that age. At a younger age, there could have been greater variations in their response's different effects of gratitude on their individual perceptions. The older the individual, the more exposure to various situations, thus they may be more accustomed to coping with these feelings, so the impact of a one-time, online gratitude intervention may have been higher with a younger individual. Future research should investigate the effects of a gratitude intervention on younger athletes currently in rehabilitation, with less experience and exposure to injury, to examine if their results are similar to this study and to investigate if age is a factor.

Additionally, when conducting research with participants within an age range, the age and experience of the individual can influence the results. Due to the age range being 18-51, this study only accounted for young adults, thus future research should address different age

brackets. Such differences could result in large variations in perceptions and the influence of gratitude. Furthermore, various athletes at different levels of competition influenced this study. For example, those who play a NCAA Division I sport may feel different anxieties and may be influenced by gratitude differently than someone who is training for a half marathon. The level of competition returning to plays a large role in the perceptions of rehabilitation. Such athletes have additional stressors on top of play; earning their starting spot, maintaining a scholarship, upholding high grades to keep eligibility, as well as many others, all influencing the process of rehabilitation and leading to those increased anxieties when returning to sport. Future research should address this and examine the stressors of returning to a university sport versus a recreational sport and the influence of gratitude on mediating those stressors.

It is also important to consider the effects of individual versus team sport. This study examined the perceptions of reinjury anxiety in athletes who are currently in rehabilitation, and how gratitude affected their individual perceptions. Variations in responses based on team versus individual sport may affect the individuals' responses. If they are fighting for their starting spot back or are solely responsible for their score, the effect that reinjury anxiety has on them may differ. To really examine how gratitude can impact reinjury anxiety, future research could examine the performances of different psychological skills and how they impact performance in rehabilitation and self-perception of performance.

Practical Implications

There are several practical implications gratitude can provide for clinicians. These results from the current study are insightful for practitioners, coaches, and athletes when deciding when/if to utilize gratitude as an anxiety reduction tool. Despite the significant decreases in gratitude levels, all other subscales improved overall positive affect by increasing perceived

social support and satisfaction with life and decreasing levels of kinesiophobia and psychological distress. Caution should still be taken when applying the results of this study to one's practice. It is still important to consider individual differences regarding unique responses to injury and anxiety.

How an injury affects a person is dependent on many factors: background, age, self-awareness, personality, etc. Certain athletes may have a severe problem with reinjury anxiety and being aware of the effects of a gratitude intervention, it may be a tool to try for those with severe reinjury anxiety. With the increase in popularity and accessibility, it is becoming a more popular tool to combat negative aspects of injury. Several tools are already put in place to combat these negative effects such as deep breathing, imagery, and various. Understanding that each individual copes differently, new ways of combating the negative effects may be a useful tool to assist those who may not benefit from the other methods. However, with the general injured athlete population, other methods of combating anxiety and the return to sport process ought to be used.

Gratitude interventions may be a beneficial tool to utilize after returning to sport when the injury is no longer present, therefore not highlighting the injury and reminding the athlete of the situation. Injury rehabilitation can bring an additional source of stress to the athlete and a sense of unknown to them. Utilizing relaxation techniques throughout a rehabilitation program can be beneficial for return to sport by modulating stress to help with improved outcomes and a faster return to sport. Additionally, gratitude can be a practical means to use as a preventative tool to combat upcoming increased stress, whether that be academic or athletic based. Coaches or trainers could employ a gratitude intervention systematically for athletes who report feeling increased anxiety or negative affect to prevent the possibility of injury in the future. Some

athletes may have a more difficult time employing gratitude interventions through technology; thus, the in-person interventions can help these athletes with their relaxation techniques and provide a more present experience to achieve a higher relaxed state and ease the transition back into a competitive level of sport.

Gratitude can be utilized within a team environment. Injury rehabilitation can bring upon additional negative effects such as isolation, self-doubt, and decreased motivation. Therefore, if reducing the negative aspects of injury is the goal, a gratitude intervention could be a viable technique to employ as a team increasing team cohesion and facilitating self-reflection. Further research on gratitude with team cohesion is needed to determine the exact relationship it can have within a team, but this study does provide insight into how useful gratitude is for reducing reinjury anxiety and other factors associated with it. With gratitude's increased accessibility and low cost, a gratitude intervention is becoming more attainable for practitioners to use to help keep teams united, rehabilitation programs effective, and individuals successful. As its popularity increases, gratitude will continue to interest the sporting world, so it is important to understand the benefits and limitations it provides in various settings.

In conclusion, the purpose of this study was to examine the effects of a one-time, online, gratitude intervention on state gratitude, reinjury anxiety, life and sport satisfaction, and anxiety of returning to sport. Results indicated that the intervention significantly decreased levels of state gratitude pre-to-post, however, did increase levels of satisfaction with life and perceived social support. Additionally, there were decreases in psychological distress symptoms and levels of kinesiophobia pre-to-post intervention. Despite no significant differences, the gratitude intervention showed decreases in negative aspects of injury and increases in positive aspects, thus, gratitude may be an effective tool to utilize throughout rehabilitation when completed

regularly. Instead, gratitude interventions may be more effective when completed in person versus online to maximize the benefits. With several limitations, this study serves as an initial step, establishing a basic framework for future research to build off of and evaluate gratitude with a more in-depth approach in regard to easing the rehabilitation and return-to-sport process within injured athletes, all aiming to reduce the effects of stress and increase performance.

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