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Psychological Readiness of Athletes to Return to Play Following Injury

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PSYCHOLOGICAL READINESS OF ATHLETES TO RETURN TO PLAY FOLLOWING INJURY

by

ALYSSA C. MONAHAN

(Under the Direction of Jessica Mutchler)

ABSTRACT

Background: Returning an injured athlete to sport before they are both physically and psychologically ready can lead to increased psychological concerns. Traditionally, return to play decisions are based on physical outcomes and it is rare if an athlete is held back from returning to sport if he or she is not psychologically ready to return. Therefore, athletes may be returning to play before they are psychologically ready. **Purpose:** The purpose of the present study was to investigate the psychological readiness of the athlete to return to play following injury, and the degree to which psychological readiness was considered by the athletic trainer (AT) when making the return to play decision. **Methods:** Thirty-four student-athletes between 18-25 years of age currently returning to play from an injury that resulted in a minimum of one missed practice or competition were included in the study. The corresponding ATs making return to play decisions were also included. Questionnaires were given to the student-athlete and the corresponding AT on the day before or day of return to play. Student-athletes completed the Injury-Psychological Readiness to Return to Sport Scale (I-PRRS), and the Athlete Fear Avoidance Questionnaire (AFAQ). ATs answered a Likert scale question assessing their degree of consideration of psychological readiness specific to the athlete. **Data Analysis:** Student-athletes were grouped based on their perceived psychological readiness, identified as: I-PRRS scores ≥ 50 = Ready, and I-PRRS scores < 50 = Not Ready. Descriptive statistics presented demographic information of the athletes and ATs, overall I-PRRS scores, overall AFAQ scores and overall degree of consideration. Independent *t*-tests were used to compare AFAQ scores, and degree of consideration scores between groups. Significance level was set to $p < 0.05$, and effect sizes were calculated. **Results:** The Ready group reported significantly less fear avoidance as compared to the Not Ready group (Ready: 14.76 ± 3.75 , Not Ready: 22.59 ± 8.71 ; $P = 0.003$; $ES = 0.89$). No differences were found in AT degree of consideration between groups. **Conclusions:** The results of this study suggest that not all athletes returning to play are highly confident in their ability to return to play, and the athletes not highly confident have higher self-reported fear avoidance. Regardless of group, the ATs providing care to these athletes and making return to play decisions overall reported only slightly considering psychological readiness when making their decision. Implementation of psychological readiness and fear avoidance questionnaires when making return to play decisions may be beneficial to ensure athletes are confident and not fearful in returning to play.

INDEX WORDS: Psychological readiness, Confidence, Fear-avoidance

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B.S., Springfield College, 2016

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Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE

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DEDICATION

I would like to dedicate this thesis to my mother, Christine Monahan. Thank you for your unconditional love and support. You have taught me to strive for everything I want in life and you've shown me that in order to succeed, I need to give it my all. Thank you for teaching me that I should never settle for anything less than what I deserve. I love you, forever and always.

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CHAPTER I

INTRODUCTON

Nationally, more than 278,000 student-athletes participated in National Collegiate Athletic Association (NCAA) sports during the 2015-2016 athletic season.¹ Involvement in a sport or physical activity has an inherent risk of injury associated with participation. According to the Injury Surveillance System (ISS), a reportable injury must meet the following criteria: (1) injury occurred as a result of participation in organized intercollegiate practice or contest; (2) injury required medical attention by a team certified athletic trainer (AT) or physician; and (3) injury resulted in restriction of the student-athlete's participation or performance for one or more days beyond the day of injury.² Division I had the highest injury rates per 1000 athlete-exposures in both games and practices and Division III had the lowest.² Nevertheless, across all divisions, the rate of game injuries was 3.5 times higher than the rate of practice injuries per athlete-exposure.² This accounts for one injury every two games and one injury every five practices for a team of 50 athletes.² With a high incidence of injury, it is important for sports medicine professionals to consider not only the physical impact of injury, but psychological aspects of injury as well.

When a student-athlete becomes injured, the immediate focus is drawn to the physical damage, and the psychological aspects of injury are often ignored. Between 5% and 19% of injured athletes report psychological responses similar to individuals receiving treatment for mental health concerns.³ These responses can have a significant influence on the quality and speed of the rehabilitation process.⁴ Additionally, psychological factors are important contributors in determining a safe and timely return.

Nevertheless, the definition of psychologically ready to return to play is unclear.⁵ The lack of clarity may be the reason why it is rare for an athlete to be held from returning to sport for the sole reason that he or she is not psychologically ready to return.^{6,7} For this study, psychological readiness is defined as “the degree to which the student-athlete is fully confident to return to play”, further defined as having a ≥ 50 score on the I-PRRS.⁸ Sport-confidence has been previously defined in literature as, “the belief of degree of certainty individuals possess about their ability to be successful in sport”.⁹ Since success means different things to different people, it is imperative sports medicine professionals consider the individual’s psychological response and personal goals for recovery.

The athlete’s psychological response to sport injuries has been explained through the Integrated Model of Response to Sport Injury and Rehabilitation Process (see Appendix C). According to the model, the athlete’s individual perspective of the injury, as well as the athlete’s emotional and behavioral responses are influenced by a range of personal, situational, and environmental factors.¹⁰ Previously, the athlete’s psychological responses have been explained through a phased approach, originally introduced by Weiss and Troxel in 1986. The phased approach includes the reaction-to-injury phase, reaction-to-rehabilitation phase, and finally, the reaction-to-RTP phase.¹¹ The Integrated Model of Response to Sport Injury and Rehabilitation Process provides theoretical support to the phased approach of rehabilitation and recovery, thus validating the importance of addressing athlete’s psychosocial responses for successful recovery.¹¹ The physical recovery of an athlete appears to be strongly influenced by the individual’s psychological response to injury across the different phases of rehabilitation.

This study specifically focused on the return to play phase. When returning to sport, athletes have expressed doubt in regards to their ability to return to play.¹¹ Feeling insecure, nervous, anxious, and fear regarding re-injury were common responses during the return to sport phase.¹¹ Furthermore, negative thoughts (e.g. anger, shock, hysteria) seemed to primarily influence perceived severity and ability to return to sport.¹¹ Specifically, fear has been shown to hinder a full and successful return to sport.¹² Previously, fear has been described as hesitation, holding back, giving less than maximal effort, being wary of injury-provoking situations, and guarding of the body part.¹² These actions often result in decreased performance and satisfaction with performance.¹² It is of concern that reported fear has been shown to increase as athletes approach returning to sport,^{13,14} and can be significantly influenced by the amount of time loss¹⁵ due to the injury. Therefore, knowing whether fear exists prior to the athlete's return to sport is imperative.¹² If these concerns are not addressed appropriately, literature has shown that even two-months post-injury, approximately 53% of injured athletes have significantly higher levels of depression, anxiety, and lower self-esteem than their non-injured or fully recovered counterparts.³ Additionally, a lack of confidence in the injured body part is also frequently observed by sports medicine professionals.¹⁴

ATs and team physicians are in positions to observe and interact with student-athletes on a daily basis, and are often responsible for providing physical and emotional support throughout all phases of rehabilitation, and making return to play decisions. When a student-athlete is injured, the AT and the team physician should be able to consider and identify the athlete's psychological response to the injury.¹⁶ However, even if psychological concerns are present, some athletes will not inform anyone but will "act

out” nonverbally as a way of alerting others that something is bothering them.¹⁶

Behaviors that may reflect psychological concerns in student-athletes include but are not limited to: withdrawing from social contact, decreased interest, loss of emotion, mood changes, irritability, excessive worry or fear, overuse injuries, unresolved injuries, or continually being injured.¹⁶

Returning an injured athlete to sport before they are both physically and psychologically ready can lead to increased or prolonged psychological concerns.¹⁷ A successful return to play may include a feeling of self-satisfaction, and the absence of injury related concerns.¹⁸ To determine physical readiness to return to play, ATs often use functional tests which assess pain, instability, kinematics, and symmetry to determine balance, coordination, and multi-planar muscular stabilization.¹⁹ There are specific recommendations and guidelines for return to play decisions based on these measures of physical performance; however, specific recommendations and guidelines for return to play based on consideration of psychological readiness are limited. Since these decisions regarding the athlete’s return to play will always depend on the individual and specific circumstances, the psychological readiness of the athlete to return to play is often overlooked or out-weighted by the physical aspects of injury recovery.²⁰

Therefore, the purpose of the study was to investigate the psychological readiness of the athlete to return to play following injury, and the degree to which psychological readiness was considered by the AT when making the return to play decision. When examining psychological readiness, the foremost question considered was if there were any athletes who were not psychologically ready to return to play, defined as lacking high confidence. Additional research questions included “To what degree did athletic trainers

consider psychological readiness when making their return to play decisions?"; "If there are athletes who are not psychologically ready, was there a difference in reported fear avoidance between athletes who were and were not psychologically ready to return to play?"; and "If there are athletes who are not psychologically ready, was there a difference between the degree the athletic trainers considered psychological readiness between athletes who were and were not psychologically ready to return to play?".

We hypothesized that among athletes currently returning to play, some athletes would not be psychologically ready to return to play; and ATs would consider psychological readiness to varying degrees, based on individual concerns. Furthermore, we hypothesized that among athletes who are not psychologically ready, athletes would report higher fear-avoidance as compared to those who were ready to return to play; and athletic trainers would report a higher degree of consideration for athletes who were not psychologically ready as compared to the athletes who were ready to return to play. The findings of this exploratory study may add to the limited research regarding psychological readiness in athletes, consideration of psychological readiness at return to play, and the need for ATs to more thoroughly address psychological readiness prior to return to play following injury.

CHAPTER II

METHODOLOGY

Participants

The current study included two participant populations: (1) Student-athletes between 18-25 years of age; and (2) Certified Athletic Trainers. All participants were from the same Division I university in Georgia. This study was approved by the Institutional Review Board.

The present study captured 34 student-athlete participants over a five-month time frame. The sample size reflects the maximum number of student-athletes within the convenience sample. Student-athlete participants included 20 males and 14 females, 18-23 years of age, participating in competition cheer and 11 intercollegiate sports including: soccer, volleyball, swimming and diving, tennis, cross country/track and field, basketball, baseball, and softball. Participants reported initial injuries (91.2% of participants), and re-injuries (8.8% of participants) that resulted in an average of 75.44 ± 108.85 days of missed practice and/or competition (See Table 1). Even though there was a large variability for the amount of time loss, the variability was similar between both groups (Ready: 129.08 ± 31.31 , Not Ready: 86.93 ± 21.08). In order to be a participant in the study student-athletes must have been returning to play from any musculoskeletal injury that resulted in a minimum of one missed practice or one competition. This amount of time loss was chosen to meet the criteria of the NCAA ISS definition of injury. Student-athlete participants were excluded from the study if: (1) they sustained an injury in which they were not able to return to participation during the data collection period, (2) if the

student-athlete was a minor, or (3) if the student-athletes' injury resulted in time loss due to a diagnosed concussion.

The university employs 17 ATs; however, three of them assisted with data collection, reducing the sample size to 14. AT participants included 6 males and 8 females with 1-18 years of experience. Previous psychosocial education and/or clinical experiences were documented for each AT. All ATs reported having previous psychology-based coursework such as introduction to psychology, sport psychology and/or abnormal psychology. In addition, all ATs reported previous mental health continuing education, specifically, QPR training. Some ATs reported supplementary mental health continuing education such as Mental Health First Aid, and conferences/lectures specifically relating to mental health and psychological interventions. Some ATs reported previous clinical experiences including athletes with suicidal ideations, anxiety, depression, disordered eating, and psychological barriers when returning to sport from both short-term and long-term injuries.

Procedures

Following approval from the Institutional Review Board, an email was sent to the ATs at the university. A student-athlete recruitment flyer was posted in the hallways and locker rooms of the athletic buildings. Participants were also recruited via word of mouth. Both the student-athlete and the AT responsible for overseeing the athlete's care and eventual return-to-play voluntarily participated in the study.

Upon verbal consent to participate in the study, the student-athlete was provided an informed consent document. By filling out the informed consent, the student-athlete gave the investigators permission to contact the AT who provided them care and to ask

the AT questions about the athlete's care. Following informed consent, the student-athlete completed a demographic form (Appendix D). The student-athlete demographic form included date of injury, date of anticipated return, if the injury was the initial injury or a re-injury, and identification of the AT that provided them with care. All student-athletes were then given two questionnaires including the Injury-Psychological Readiness to Return to Sport Scale (I-PRRS) and the Athlete Fear Avoidance Questionnaire (AFAQ).^{8,21} The student-athletes were asked to be truthful in their responses. These questionnaires can be found in Appendix D.

The AT was given a separate informed consent and demographic form, which requested information such as years of experience as a certified AT, previous psychology-related coursework, psychology-related continuing education seminars, and previous clinical experience related to psychosocial concerns. The AT also reviewed the information provided by the student-athlete; specifically, the date of injury, expected date of return, and if the injury was an initial injury or re-injury. He or she was allowed to make corrections to this information if needed. The AT was then asked to answer the following question truthfully: "To what degree did you consider psychological readiness when making your decision to return to play for this specific athlete?". The response ranged on a 5-point Likert-type scale from 0 (not at all) to 4 (a great deal). The AT was also given the opportunity to further elaborate on their response. This questionnaire can be found in Appendix D.

Administration of the questionnaires occurred in a controlled environment on the day before or the day of return to play. If data could not be captured on the day of or day before return to play, data was not collected for that particular athlete. Return to play was

defined as the point in recovery when an athlete was able to participate in sport following an injury.² For team sports, return to play occurred when the student-athlete was able to participate in team drills or competition without limitations of the injured body part during the designated practice time/competition. For individual sports, return to play occurred when the student-athlete was able to participate in designated practice activity or competition without limitations of the injured body part.

To help maintain confidentiality, the I-PRRS Scale, AFAQ, and directions were given to the student-athlete in a sealed manila envelope, and administered by the lead investigator. Neither the student-athlete nor the AT were aware of the other's responses to the questionnaires. The student-athletes' questionnaires and the corresponding AT's survey were coded by number to remove identifiable information of the student-athlete and AT during data entry. For example, the first student-athlete questionnaire received was numbered 001; the second questionnaire received was numbered 002. The demographic forms of the ATs were numbered AT01 to AT14. Therefore, the student-athlete and corresponding AT data would be entered as AT01_001. The primary investigator was the only person with access to the forms with identifiable information.

Instrumentation

The I-PRRS has been developed and validated to be used as a tool to assess and determine if an athlete is psychologically ready to return to sport following injury.⁸ The questionnaire is a 6-item scale that measures the confidence of injured athletes to return to competition.⁸ Item examples include overall confidence to play, confidence to play without pain, and confidence in the injured body part to handle demands of the situation.⁸ The response scale for each item ranged from 0 to 10, a score of 0 implied that the athlete

had little to no confidence, a score of 5 implied moderate confidence, and a score of 10 implied that the athlete had highest confidence for that item.⁸ The maximum score was 60, which inferred that an athlete had the highest confidence to return to sport at that time. A score of 40 indicates the athlete had only moderate confidence, and a score of 20 indicates the athlete had low overall confidence.⁸

Reliability for the I-PRRS was found to be good ($\alpha > 0.70$).⁸ To determine if the results of the I-PRRS corresponded to those previously established in literature, concurrent validity was established with the POMS ($r = -0.57$ to -0.78).⁸ Additionally, to determine if the results could be generalizable to other people, external validity was checked by comparing athlete and AT responses ($r = 0.82$).⁸ The I-PRRS scale is specifically designed to measure psychological readiness through confidence of injured athletes to return to play. Other scales that successfully measure confidence within sport, however, those scales only measure general trait assessments rather than sport-specific situations, such as an athlete returning from an athletic injury. It is recommended that if an athlete's I-PRRS score is not high (e.g., lower than 50), waiting a little longer before returning the athlete may be best.⁸ If athletes are expected to return to play with high physical demands, then we cannot expect them to return with less than high confidence. Therefore, a score of 50 was used as our cut-off when determining between athletes who are psychologically ready to RTP, and those whom are not.

The AFAQ has been used and validated to determine fear avoidance in athletes related to their sport injury and recovery.²¹ The questionnaire is a 10-item scale that measures the injury-related fear-avoidance in athletes.²¹ Item examples include: "I will never be able to play as I did before my injury," and "I worry that if I go back to play too

soon I will make my injury worse”.²¹ The response scale for each item ranged from 1 to 5, a score of 1 implied that the athlete had no fear-avoidance, a score of 5 implied a great degree of fear-avoidance.²¹ The maximum score was 50, which indicates that an athlete had high fear-avoidance. A score of 10 indicates the athlete has no fear-avoidance at all.²¹

The AFAQ was found to be reliable ($\alpha > 0.805$), and concurrent validity was established with the Fear Avoidance Belief Questionnaire (FABQ; $r = 0.59$).²¹ A gold standard to assess injury-related fear avoidance in athletes has not been previously established in the literature. However, other questionnaires that assess injury-related fear avoidance such as the FABQ and the Fear Avoidance Beliefs Questionnaire-Work (FABQ-W), have been well established in literature for the general population and work-related injuries.²¹ The FABQ-W has been identified as the strongest predictor of work status and may be used to determine return to work.²² However, the AFAQ is specifically designed to assess fear avoidance and pain-related fear in athletes.²¹

Both questionnaires, the I-PRRS and the AFAQ, have independently been recommended as psychosocial instruments that can assist in making return to play decisions.^{8,21} Due to these recommendations, this research study used the questionnaires to describe the psychological readiness of NCAA Division I athletes and cheerleaders at their return to play and the degree to which the corresponding AT considered psychological readiness when making their return to play decision.

The AT degree of consideration question wording and response anchors²³ were created based upon examples in previous literature. The question was developed by the primary investigator and was reviewed and assessed by additional ATs for clarity. Participating ATs were also given an opportunity to explain their response.

Commonalities in the responses were used to describe the responses and support results. However, the explanation was not used to develop common themes or patterns.

Data Analysis

Descriptive statistics (means and standard deviations) were calculated for all demographic and study variables. Student-athletes were classified into two groups, Ready or Not Ready, based on their perceived psychological readiness to return to play via I-PRRS scores. All student-athletes who scored highly confident with an I-PRRS score greater than or equal to 50 were classified as Ready ($I\text{-PRRS} \geq 50$).⁸ All student-athletes who scored below highly confident with an I-PRRS score less than 50 were classified as Not Ready ($I\text{-PRRS} < 50$).⁸

The Statistical Package for the Social Sciences (SPSS v.23.0) was used to complete all statistical analyses. Means and standard deviations were calculated for overall I-PRRS, overall AFAQ scores, overall AT degree of consideration, I-PRRS scores per group, AFAQ scores per group, and AT degree of consideration per group. Independent *t*-tests were used to compare AFAQ scores and AT degree of consideration responses between the Ready and Not Ready groups. The alpha level was set to $p < 0.05$. Cohen's *d* effect sizes (ES) were calculated and interpreted as small (≥ 0.2), moderate (≥ 0.5), and large (≥ 0.8) effects.²⁴ To calculate the sample size needed to produce power for this study, we ran a G*Power analysis using a large effect size (≥ 0.8). However, an accurate prospective statistical power for this study could not be determined due to a lack of previous literature using similar methods. Therefore, Cohen's *d* ES was used to determine and report observed power based on the number of participants, the means, and the standard deviations of variables.

CHAPTER III

RESULTS

Student-athlete in this study were approximately 19 years old and experienced an average time loss from participation that was over 75 days. Demographic information for age, time loss, and sport are presented in Table 1. It was determined that 17 student-athletes scored ≥ 50 on the I-PRRS and were placed in the Ready group. The other 17 student-athletes scored < 50 on the I-PRRS and were placed in the Not Ready group. ATs in this study reported 1-18 years of experience and a variety of psychology-based coursework, continuing education and clinical experiences. Specifics courses taken included introduction to psychology/general psychology (14), sport psychology (3), abnormal psychology (5) and/or other (4) In addition, ATs reported previous mental health continuing education, specifically, QPR training (14), Mental Health First Aid (3), and conferences/lectures specifically relating to mental health and psychological interventions (8).

Upon analysis, Levene's test for homogeneity was violated due to unequal variances, therefore, the following results were interpreted with the corrections. There was a statistically significant difference in the AFAQ scores between the Ready and Not Ready groups (Ready: 14.76 ± 3.75 , Not Ready: 22.59 ± 8.71 ; $P = 0.003$; $ES = 0.89$). Observed statistical power for 34 participants was 81% for the difference in AFAQ scores between groups.²⁴ No statistically significant differences were present in AT degree of consideration between groups (Ready: 2.59 ± 1.33 , Not Ready: $2.76 \pm .65$; $p = 0.628$; Cohen's $d = 0.13$). Overall and per group scores for the I-PRRS, AFAQ and AT degree of consideration are presented in Table 2.

CHAPTER IV

DISCUSSION

The purpose of the study was to investigate the psychological readiness of athletes at return to play following injury, and the degree to which psychological readiness was considered by the corresponding AT when making the return to play decision. We hypothesized that among athletes currently returning to play, some athletes would not be psychologically ready to return to play; and ATs would consider psychological readiness to varying degrees, based on individual concerns. Furthermore, we hypothesized that among athletes who are not psychologically ready, athletes would report higher fear-avoidance as compared to those who were ready to return to play; and athletic trainers would report a higher degree of consideration for athletes who were not psychologically ready as compared to the athletes who were ready to return to play.

The results of this study indicated some athletes returning to play were not considered to be psychologically ready, defined by confidence scores less than 50 on the I-PRRS. Between these groups, there was a difference in reported fear avoidance, which supports our hypothesis. Overall AT consideration of psychological readiness was 2.59 and 2.76 for Ready and Not Ready groups respectively, which is interpreted to be slight²³ consideration of psychological readiness. Our results suggest that the ATs did not consider psychological readiness differently in student-athletes who appeared to have lower confidence as compared to those who appeared highly confident, and therefore deemed psychologically ready. Included in this discussion is an interpretation of the

results for psychological readiness at return to play, fear avoidance at return to play, and the AT degree of consideration.

Psychological Readiness at Return to Play

Psychological readiness in this study was defined as having high confidence to return to play following injury, and determined by a score of 50 or more on the I-PRRS. It is recommended that if an athlete's I-PRRS score is not high, defined as a score of 50 or above, waiting a little longer before returning the athlete may be best.⁸ Given the suggestion that student-athletes wait to return to play until they are highly confident, leaves us to question whether low to moderately-confident athletes are returning to play too soon. Especially since the Integrated Model of Response to Sport Injury and Rehabilitation Process has shown that a common response during the return to play phase is feeling insecure.¹⁰ Furthermore, previous literature has exhibited that returning athletes to sport before they are psychologically ready can lead to fear, anxiety, re-injury, injury to different body parts, depression, and a decrease in performance.^{17,25}

For this study, trends in psychological readiness before returning to play were similar to those described by.⁸ In their study, student-athletes reported I-PRRS scores of 45.32 ± 9.61 before participating in practice, and 54.32 ± 3.76 before returning to competition.⁸ In our study, the student-athletes reported overall I-PRRS scores of 46.94 ± 10.19 before returning to unrestricted practice and/or competition. When interpreting overall confidence scores, it may appear that the student-athletes in this study were psychologically ready to return to play. However, the average score does not represent the individualized perceived confidence of the athletes, which can misrepresent the

student-athletes with low to moderate confidence. Upon dividing the student-athletes into groups of high confidence (Ready), and less than high confidence (Not Ready), those in the Not Ready group have a lower average score than the overall average. Additionally, the student-athletes in the Not Ready group have a lower average score compared to those returning to practice in the study performed by Glazer.⁸

Furthermore, the Glazer⁸ did not define practice as unrestricted. This may indicate that a student-athlete in the current study may have been returned on a day equivalent to competition play as some athletes did complete the questions prior to a competition. Therefore, athletes in our study should be compared to somewhere between the practice (45.32 ± 9.61)⁸ and competition (54.32 ± 3.76)⁸ I-PRRS scores reported in the previous study. This suggests that some athletes may be returning to play too soon, and may be at risk for continued or prolonged psychological concerns and re-injury.

Fear Avoidance

When comparing the Ready and Not Ready groups, student-athletes in the Not Ready group reported significantly higher fear avoidance ($P = 0.003$) than those in the Ready group. It is of concern that the athletes whom had low to moderate confidence in returning to play also expressed higher fear avoidance than those with high confidence.

Our results on fear avoidance were similar to total fear avoidance beliefs described by Watt et al.²⁶ Their study examined the relationship between fear avoidance beliefs, health-related quality of life, and their influence on return to work outcomes.²⁶ Participants in the previous study were receiving vocational rehabilitation services from a Return to Work Assist programs. Participants in the no-return to work group reported

significantly greater fear avoidance ($P = 0.008$) as compared to those who returned to work.²⁶ This can be compared to our study as participants in both studies were expected to perform tasks at a pre-injury level. Additionally, in a study assessing fear of re-injury as a factor in returning to previous level of activity, patients who did not return to their pre-injury level of activity had significantly more fear of pain or re-injury ($P = 0.01$).¹⁴

ATs have been known to utilize a progressive return to play through setting limitations on the injured body part. Progressive rehabilitation can allow the athlete to increase confidence and decrease fear before return to play. If this is not completed appropriately during rehabilitation, fear avoidance can lead to prolonged injury, re-injury, anxiety, depression, decreased performance, and physiological changes.²⁷ Since the prominence of fear has been shown to increase prior to return to play, the time of transition back to full sports participation should be monitored closely to ensure the athlete feels adequately supported in their return to sport.^{12,28} However, even though ATs have a strong background in recognizing psychological concerns, formally testing psychological readiness is not typically used when making return to play decision.

AT Degree of Consideration

ATs have been provided a foundation of knowledge regarding athletes' psychological responses to injury, which is taught and assessed in accredited professional athletic training education programs. The professional knowledge primarily focuses on identification of signs and symptoms as well as referral strategies. Literature has shown that when compared to applied sport psychology specialists, ATs demonstrated high accuracy in identifying symptoms ($P < 0.01$) and making referral decisions ($P < 0.01$),

but struggled in selecting appropriate psychosocial strategies such as helping the athlete develop focus cues and teaching imagery techniques.²⁹ Previous research has also shown that ATs generally felt competent and frequently used goal setting, motivation, and self-talk, yet they reported feeling unprepared to implement more advanced mental skills such as imagery and relaxation training.^{30,31}

ATs' perceived competency, years of experience, and previous psychological coursework has been shown to positively affect their ability to accurately identify symptoms, determine appropriate psychosocial strategies, and make referral decisions.²⁹ Specifically, it has been reported that the ATs' years of experience is a good predictor of their accuracy in making referral decisions ($P < 0.01$).²⁹ The population in this study included ATs with 1-18 years of experience. Therefore, we cannot expect the ATs with less experience to accurately identify psychological concerns based solely on years of experience.

Although years of experience varied among the participants in the current study, all of the ATs reported previous psychology-based coursework, mental health continuing education, and/or clinical experiences related to mental health. Exposure to sport psychology coursework has also been reported as a significant predictor of ATs' accuracy in diagnosing symptoms ($P < 0.01$), and recommending appropriate psychosocial strategies ($P < 0.01$).²⁹ This may be one explanation as to why no difference was found in the reported degree of consideration of psychological readiness between the Ready and Not Ready groups. It is important to note that although the overall mean of AT degree of consideration, and means for each group all indicated slight consideration, the overall

mode and mode per group was three, indicating moderate consideration of psychological readiness. This may suggest that the ATs most frequently consider psychological readiness to a moderate degree, and then either increase or decrease their consideration based on their perceptions of the athlete's individualized need. ATs were not questioned on specific psychosocial strategies utilized, or if the student-athlete was referred to a sport psychologist for additional mental health support, but were given the opportunity to explain the answer they gave to the Likert-type question.

Regardless of group, common responses among AT explanations included effective communication between AT and the student-athlete, knowledge of athlete's personality and medical history, time loss, and if the injury directly affected the student-athlete's primary position/role with team. For example, in the Ready group one AT stated their consideration was "A Great Degree" because the severity of the injury required surgery; the time loss from participation was greater than one year; the AT communicated with the athlete on a daily basis; and the AT adjust the RTP progression to better fit the athletes' needs. A different AT reported "Not at all" for their consideration of psychological readiness because the severity of the injury was minor; and the time loss from participation was approximately one week.

On the other hand, in the Not Ready group, one AT stated their consideration was "A Great Degree" because the nature of the injury was unique due to lack of previous literature; the injury required surgery, the time loss was approximately seven months; the AT communicated with the athlete on a weekly basis over the summer break; and the AT provided one on one attention with the athlete during the RTP progression. Another AT

reported their consideration was “Slight” because the time loss was approximately one week; the AT acknowledged that the athlete was upset about missing a tournament; the AT and the athlete communication daily; and the AT reported considering psychological readiness earlier in the rehabilitation process rather than before RTP>

All of these comments show individualization in the consideration based upon the perception of the student-athlete’s readiness. Additionally, it is important to note that even though there wasn’t a difference found between groups, all of the ATs with athletes in the Not Ready group reported either a Slight, Moderate, or A Great Degree of consideration of psychological readiness while a few ATs with athletes in the Ready group did report no consideration at all.

Overall, the current study has suggested that not all athletes returning to play are psychologically ready, and that the athletes not psychologically ready may have higher self-reported fear avoidance. The ATs providing care to these athletes and making return to play decisions overall reported only slightly considering psychological readiness when making their decision. This degree of consideration was similar across both groups of athletes. It is important to highlight that the ATs were not provided the athletes’ scores on the questionnaires, and the results of their scores did not influence their return to play. The independent use of patient-reported outcomes by the ATs was not prohibited or restricted in any way, but also was not reported by any ATs when providing the rationale for their degree of consideration.

The primary concern regarding the results of the study is that some athletes are being returned to play before psychologically ready, and with a significantly higher

degree of fear than their highly confident counterpart. These findings may indicate the need for psychological readiness and fear avoidance questionnaires, such as the I-PRRS and AFAQ, to be administered and considered when making the decision of whether the athlete is ready to return to play or not.

Limitations and Future Research

There were several limitations to the current study. Outside psychological factors such as personal, situational or environmental influences of the student-athlete were not considered or controlled. ATs in the study had varying years of clinical experience and educational background. Additionally, we did not explore if psychosocial strategies were implemented in the rehabilitation process or if student-athletes were referred to sport psychologists. All participants were recruited from one institution over approximately five months, which limited the sample size of both the student-athletes and ATs. Lastly, there will always be an inherited bias when completing survey research due to social desirability. The limitations of this study are realistic and traditional limitations when researching at the collegiate setting. Future research should include a larger sample size over a longer time frame, and across several collegiate institutes. It may be beneficial to investigate athlete responses on the I-PRRS and the AFAQ at several benchmarks during the rehabilitation process to determine how the responses change over time, and if these scores affect psychosocial strategies, length of time loss, and return to play decisions.

Conclusion

Identifying student-athletes with decreased confidence and high levels of fear avoidance using sport-specific scales could allow clinicians to address psychological

barriers earlier in the rehabilitation process, prior to making return to play decisions. By monitoring the individual student-athlete's psychological readiness to return to sport participation, ATs can more confidently determine the appropriate time for injured athletes to return to competition without the concern of prolonged fear avoidance and psychological concerns. Therefore, future research should investigate athlete responses on the I-PRRS and the AFAQ at several benchmarks during the rehabilitation process to determine how the responses change over time, and if these scores affect psychosocial strategies, length of time loss, and return to play decisions made by the corresponding AT.

Table 1. Student-Athlete Participant Demographic Information

Demographic	Mean \pm SD
Age (years)	19.76 \pm 1.42
Time Loss (Days)	Overall: 75.44 \pm 108.85 Ready: 129.08 \pm 31.31 Not Ready: 86.93 \pm 21.08
Sport	Baseball (10) Women's Soccer (2) Men's Soccer (7) Cheerleading (1) Women's Swimming & Diving (4) Volleyball (1) Women's Tennis (1) Men's Tennis (2) Softball (1) Cross Country / Track & Field (2) Women's Basketball (2) Men's Basketball (1)

Table 2. Overall and Between Group Scores for all Questionnaires

Measure	Mean Scores \pm SD			<i>p</i> -value	ES	Confidence Interval
	Overall	Ready	Not Ready			
I-PRRS Scores	46.94 \pm 10.19	55.76 \pm 2.75	38.12 \pm 6.42	N/A	N/A	N/A
AFAQ Scores	18.68 \pm 7.71	14.46 \pm 3.75	22.59 \pm 8.71	.003†	0.89	-12.597 to -3.050
Degree of Consideration	2.68 \pm 1.04	2.59 \pm 1.34	2.76 \pm 0.66	.628	0.13	-0.919 to 0.566

† Statistical significant difference between variables at $p < 0.05$

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APPENDIX A
EXTENDED INTRODUCTION

Research Questions:

- RQ₁: Are athletes psychologically ready to return to play following injury?
- RQ₂: To what degree did athletic trainers consider psychological readiness when making their return to play decisions?
- RQ₃: If there are athletes who are not psychologically ready, is there a difference in reported fear avoidance between athletes who were and were not psychologically ready to return to play?
- RQ₄: If there are athletes who are not psychologically ready, is there a difference between the degree the athletic trainers considered psychological readiness between athletes who were and were not psychologically ready to return to play?

Research Hypotheses:

- H₀: All athletes feel psychologically ready to return to play.
- H₁: Among athletes currently returning to play, some athletes will not be psychologically ready to return to play.
- H₀: Consideration of psychological readiness by the athletic trainer was the same for all athletes.
- H₂: Athletic trainers will consider psychological readiness to varying degrees, based on individual concerns.
- H₀: There will be no difference in reported fear-avoidance between athletes who were not psychologically ready and those who were ready to return to play.

H₃: Athletes who were not psychologically ready will have higher fear avoidance compared to those who were ready to return to play.

H₀: There will be no difference in reported athletic trainer degree of consideration between athletes who were psychologically ready and those whom were not.

H₄: Athletic trainers will report a higher degree of consideration for athletes who are not psychologically ready as compared to the athletes who were ready to return to play.

Inclusion Criteria:

- Male and female student-athletes between 18-25 years of age returning to play from an injury resulting in a minimum time loss of one missed practice or one missed competition during the data collection period.
- Athletic Trainers with varying years of experience employed at Georgia Southern University.
- Voluntary Participation.

Exclusion Criteria:

- Student-athletes with an injury that does not allow them to return to play during the data collection period.
- Student-athletes resulting from time-loss due to a concussion.
- Student-athlete is a minor.
- Athletic trainers assisting in data collection (3).

Limitations:

- Outside psychological factors such as personal, situational or environmental influences.

- Athletic trainers with different educational backgrounds.
- Athletic trainers with varying years of clinical experience.
- Social Desirability.
- All participants were part of a convenience sample collected over a five-month time frame.

Assumptions:

- Student-athletes and athletic trainers will be truthful in answering all questions.

Operational Definitions:

- Return to play: The point in recovery when an athlete is able to participate in sport following an injury. For team sports, return to play will occur when the athlete is able to participate in team drills without limitations during the designated practice time. For individual sports, return to play will occur when the athlete is able to participate in designated practice activity without limitations of the injured body part.
- Psychological Readiness: The degree to which the student-athlete is fully confident to return to play, further defined as having a ≥ 50 score on the I-PRRS.

APPENDIX B

REVIEW OF LITERATURE

The following review of literature will summarize the current knowledge of psychological readiness to return to play following injury as well as the physical and psychological considerations of Certified Athletic Trainers (ATs). Included in this review is background information on epidemiology of athletic injury; psychology of injury as it pertains to the athletic population; and defining return to play. These main topics will break down into the psychological response to injury; psychological strategies and referral guidelines commonly used by ATs and sports medicine professionals; physical considerations of return to play; psychological considerations of return to play; and measuring psychological readiness to return to play.

Epidemiology of Athletic Injury

The National Collegiate Athletic Association (NCAA) Injury Surveillance System (ISS) has collected injury and exposure data from sport activities since 1988. A total of 182,000 injuries and slightly more than one million exposure records are contained in a sample from 1988 through 2004¹ According to the ISS, the participation in men's sport increased 28% between the 1891-1982 athletic season to the 2003-2004 athletic season. Participation in women's sports has also increased nearly 120% during this time period.² More than 450,000 student-athletes participated in NCAA sports during the 2011-2012 athletic season.³ According to the ISS, a reportable injury must meet the following criteria: (1) injury occurred as a result of participation in organized intercollegiate practice or contest; (2) injury required medical attention by a team certified athletic

trainer or physician; and (3) injury resulted in restriction of the student-athlete's participation or performance for one or more days beyond the day of injury.¹

The highest game injury rates occur during regular season competition with 14.5 injuries per 1000 exposures.¹ Preseason accounts for the lowest injury rates in all divisions with 6 injuries.¹ Postseason injury rates were significantly higher than those in preseason with 8.7 injuries, however, these rates were significantly lower than those in the regular season.¹ For practices, preseason accounted for the highest injury rate with 6.6 injuries per 1000 exposures, whereas post season has the lowest with 1.6 injuries occurring during practice.¹ Regardless of season, Division I had the highest rates in both games and practices and Division III had the lowest.¹ The rates account for one injury every two games and one injury every five practices for a team of 50 athletes.¹ For both practices and games, player contact accounted for the majority of injuries with 41.6% and 58% respectively. Noncontact mechanisms accounted for 17.7% in games and 36.8% in practices. A high percentage of noncontact injuries primarily reflects muscle strains and joint sprains.¹

Approximately 18-30% of all acute injuries are sport related.⁴ The most commonly injured body part from both practice and games was the lower extremity with 53.7% and 53.8% respectively.¹ The next commonly injured body part is the upper extremity with 21.4% occurring during practice and 18.3% from games.¹ The head/neck and trunk/back were the next most commonly injured followed by other/system being the least commonly injured. With a high prevalence of injury across all divisions, it is important for sports medicine professionals to consider not only the physical impact of injury but psychological aspects of injury as well.

Psychology of Athletic Injury

Psychological Response to Injury

Weiss and Troxel⁵ were the first to attempt to identify the psychological response to athletic injury. Factors such as level of self-esteem, anxiety, and motivation are likely to affect an athlete's response to injury and the rehabilitation process.⁵ Weiss and Troxel⁵ proposed that injured athletes pass through four stages of response to injury. These stages include: (1) "What happened?" or the injury as a stressor; (2) "What do athletes think about what happened?" or the cognitive appraisal of injury; (3) "How does the athlete feel about what happened?" or their emotional response to injury; and finally, (4) "What will the athlete do about what happened?" or their behavioral rehabilitation consequence.⁵ The authors found that of the athletes who were interviewed, their responses to injury included fear, tension, fatigue, disbelief, depression, and somatic complaints such as insomnia, loss of appetite, and upset stomach.⁵ Regardless of how the response to injury is described, athletes will manifest different reactions to injury and may exhibit different reactions due to a variety of factors.⁵

The athlete's psychological response to sport injuries has also been explained through the Integrated Model of Response to Sport Injury and Rehabilitation Process. This model provides theoretical support to the phased approach, thus validating the importance of addressing athlete's psychosocial responses for successful recovery.⁶ According to this model, the athlete's individual perspective of the situation or injury, as well as the athlete's emotional and behavioral responses are influenced by a range of personal, situational, and environmental factors. The model recognizes the interaction among the cognitive appraisal and the emotional and behavioral responses as a dynamic

and multidirectional process, which in turn has an effect on both physical and psychological recovery outcomes.⁷ Weise-Bjornstal et al.⁷ postulated that with the application of the model across the different phases of rehabilitation, ATs could potentially be more cognizant of athlete's psychological response and be able to take the necessary steps to ensure successful recovery.

Clement et al.⁶ reported that athletes had changes in their cognitive appraisals and heightened emotional responses a result of their diagnosis. The top three psychological reactions to an injury were stress or anxiety, anger, and treatment adherence problems.⁶ It has also been supported in literature that the athlete's knowledge of their injury amplified previously reported negative thoughts, emotions and feelings of isolation.^{6,8} During rehabilitation, the main feeling vocalized by athletes was anger, frustration, and depression. However, both positive and negative appraisals have been shown to be reported during the recovery phase.⁶

When returning to sport, the athletes expressed doubt in regards to their ability to return to play.⁶ Feeling insecure, nervous, and anxiety or fear regarding re-injury were common in the return to sport phase.⁶ Furthermore, negative thoughts (i.e. anger, shock, hysteria) seemed to primarily influence perceived severity and ability to return to sport. Literature has shown that even two months post-injury, approximately 53% of injured athletes have significantly higher levels of depression, anxiety, and lower self-esteem than their non-injured or fully recovered counterparts.⁹ Therefore, returning an injured athlete to sport before they are both physically and psychologically ready can lead to further psychological concerns.¹⁰

Since fear is a common reaction during recovery and return to sport, the fear-avoidance model has been created and used extensively in literature. The model is based on the emotional reaction of pain perception and high levels of fear avoidance that can lead to dysfunction.¹¹ The model contains two extreme coping responses to injury, confrontation and avoidance. A person who shows the adaptive response of confrontation is: (1) likely to be someone who views pain as a temporary nuisance; (2) strongly motivated to return to normal activities; and (3) prepared to confront their personal pain barrier.¹¹ On the contrary, the pain-avoider is considered to be motivated to avoid exposure to pain. This is viewed as having two components: (1) avoidance of pain experience or cognitive avoidance; and (2) avoidance of painful activities or behavioral avoidance.¹¹ Individuals who experience elevated levels of fear of pain and signs of fear avoidance associated with acute injury are more likely to develop chronic pain than those who confront their fears.¹¹

The chance of re-injury or failed recovery are factors almost every injured athlete is concerned with. An individual may fear being re-injured while in the recovery phase or throughout the return to play process. In a literature review of anterior cruciate ligament (ACL) injuries, only 36% of the patients reduced their activity level due to the knee function alone.¹² In a previous study, 24% of participants reported the reason for not returning to sport after ACL injury was fear of re-injury.¹² The participants who returned to the pre-injury level of activity had less fear for re-injury due to movement, expressed by the Tampa Scale of Kinesiophobia (TSK).¹²

Traditional rehabilitation programs are designed to ensure the athletes' full recovery to pre-injury level. However, athletes must not only be physically prepared to

return to sport but also psychologically ready.¹³ What it means to be psychologically ready to return to play is unclear, however, psychological factors are important contributors in determining a safe and timely return.¹⁴ Athletes initially reported a negative response to injury such as anger, frustration, and depression at the beginning stages of rehabilitation. Even though psychological factors such as anxiety and depression have been shown to correlate with injury occurrence, it is rare if an athlete is held back from returning to sport if he or she is not psychologically ready to return.^{15,16} Therefore, healthcare professionals such as ATs should promote motivation, increase support from the coaches and teammates, and apply appropriate psychological strategies and referral techniques.

Psychological Strategies and Referral

Behaviors that may reflect psychological concerns in student-athletes include but are not limited to: withdrawing from social contact, decreased interest, loss of emotion, mood changes, irritability, excessive worry or fear, and overuse injuries, unresolved injuries, or continually being injured.³ However, even if psychological concerns are present, some athletes will not inform anyone but will “act out” nonverbally as a way of alerting others that something is bothering them.³ A lack of confidence in the injured body part is a common observation made by sports medicine professionals.¹² Therefore, it is imperative that these professions have the knowledge and ability to recognize both the obvious psychological concerns and the subclinical changes in mood and mental state.

ATs and team physicians are in positions to observe and interact with student-athletes on a daily basis. Often, these personnel have the trust of the student-athlete and are people the student-athlete turns to for advice or during times of crisis.³ Sports

medicine professionals believe they must address psychological aspects of injuries in order for their work to be effective.¹⁷

Psychological skills are assumed to strengthen rehabilitation, however, the implementation of psychological strategies are often limited within the rehabilitation program. Some techniques have been shown to benefit the injured athlete by promoting and maintaining a positive environment. Literature shows ATs frequently use specific psychological strategies including: keeping the athlete involved with the team, using short-term goals, creating variety in rehabilitation exercises, encouraging effective communication, and encouraging positive self-talk.¹⁷ Some strategies that have been shown to have success include support from friends and family, goal setting, imagery, simulation training, and a lesser form of verbal persuasion.¹⁸

Support has been reported to be important in situations where rehabilitation was slow, during setbacks, and when other life demands added additional pressure on the athlete.¹⁸ In a study examining the impact of goal orientations, perceptions of support, and sources of rehabilitation confidence on the process of confidence restoration from athletic injury among intercollegiate athletes, the authors noted that overall support from family, teammates, coaches, and sports medicine professionals may have contributed to the athlete's ability to focus on the personal progress in rehabilitation and increased confidence.¹⁹ Reassurance from family and close friends can also have a positive impact on the athletes psychological state throughout the recovery process.²⁰ The implementation of these psychological strategies allows the athlete to focus on healing and decreases stress or anxiety through positive psychological strategies.¹⁹ Injured

athletes (87%) were less likely to report symptoms of depression and anxiety at return to play when they received satisfactory support from ATs.²¹

By providing appropriate rationale and implementing psychological strategies, ATs may also have the ability to enhance rehabilitation adherence rates and prevent over-adherence which are important factors in achieving optimal outcomes.²² For example, setting goals in the beginning of the rehabilitation can promote adherence and during return to play to enhance self-efficacy.¹⁸ When ATs take the time to make the environment of the athletic training room familiar and less threatening, injured athletes are more likely to look to those in the athletic training setting to promote their confidence regarding the outcome of rehabilitation.¹⁹ Therefore, the education of psychosocial techniques plays a vital role in the preparedness and confidence of the AT to care for the injured athlete.²³

The National Athletic Trainer's Association Executive Committee for Education released educational competencies which includes the Psychosocial Strategies and Referral content areas to ensure psychological support is provided for injured athletes. The Clinical Integration Proficiencies and competencies were designed to ensure that ATs are exposed to situations that will increase their ability to provide psychological support to injured athletes, and ensure a holistic approach to injury rehabilitation.¹⁷ These competencies mainly focus around signs and symptoms of a mental illness and referral strategies, however, techniques to assist the AT in the rehabilitation and return to play decisions are not available.

Since the current standards of practice are limited, ATs have expressed a desire to increase their current knowledge and understanding of psychological strategies, such as

understanding motivation, using effective communication, and setting realistic goals, in order to provide the best possible care and advice to injured athletes.¹⁷ Of the ATs who responded to a questionnaire, 47% believe that every injured athlete suffers psychological trauma to some extent. Twenty-four percent responded that they have referred an athlete for counseling for situations related to their injury.²⁴ Finally, 25% of ATs reported that they have a sport psychologist as a member of their sports medicine team. Of the ATs indicating having access to sport psychologists, 84% reported making a referral for services.¹⁷ This suggests that ATs should address the psychological aspects of injury as well as the development of referral to the appropriate provider during their education to ensure appropriate return to play of injured athletes.²⁴

Defining Return to Play

Physical Considerations of Return to Play

One of the main goals of sports medicine practitioners is to return an injured athlete as quickly as possible without putting that individual at risk for further harm. After a musculoskeletal injury, the time for an athlete's full recovery and return to play is influenced by a variety of factors including pre-injury condition, type of tissue injured, response to treatment, need for surgical intervention, the demands of sport activity, and the psychological impact of injury.²⁵ Overuse syndromes, re-injury, and even long-term disability may occur when an athlete returns to sport too quickly.²⁶ A full recovery is not assured unless joint range of motion, flexibility, strength, coordination, general fitness, endurance, and sport specific skills are optimized.²⁷ However, a successful return to play can be achieved by a combining evaluation, musculoskeletal care or treatment, rehabilitation, functional testing, and training in sport specific skills.²⁷

Musculoskeletal tissue healing has defined limits that cannot be shortened without risk of harm. The phases of tissue healing and recovery have been well established in literature and include: acute response to tissue damage and inflammatory phase, proliferation phase to prepare for granulation of tissue, and the maturation phase or the restoration of normal tissue function.²⁸ Treatment and rehabilitation should progress through these phases to reduce the chance of re-injury and increase the athlete's ability to perform at their best after return to play.

Treatment of the athlete should be initiated as early as possible. The key principles of treating any musculoskeletal injury include early control of inflammation, minimizing period of immobilization, active range of motion, flexibility, strengthening, and endurance exercises.²⁷ Utilization of therapeutic modalities and manual therapy are also beneficial in the treatment of musculoskeletal injuries. Additionally, the rehabilitation plan should include re-injury prevention training.²⁹ Continually monitoring the athlete's recovery process is necessary to ensure the efficacy of treatment and keep the athlete on the path to full recovery.²⁷ Unfortunately, specific recommendations and guidelines are limited for most return to play decisions. Therefore, decisions regarding the athlete's return to play will always depend on the individual and specific circumstances.²⁷

In determining the athlete's ability to return to play from an musculoskeletal injury, subjective and objective data is required in both a quantitative and qualitative manner.³⁰ A significant amount of objective scoring systems exist in the literature, however, at the present time, none have been validated for return to play.³⁰ Therefore, tests for determining return to play should assess pain, instability, kinematics, and

symmetry to determine balance, coordination, and multi-planar muscular stabilization with weight-bearing loads. Balance and proprioception can be tested functionally through The Star Excursion Balance Test (SEBT). This test requires strength, flexibility, and proprioception and can determine unilateral balance and dynamic muscular control.³⁰ Agility can be determined through the T-Test which assesses movement in multiple directions. The typical time to complete this test for athletic adults is between 8.9 and 13.5 seconds.³⁰ The Vertical Jump Test can evaluate strength, speed, energy, dexterity, and estimation of power. This test is important because athletes who demonstrate deficits in strength and flexibility are more prone to lower extremity injuries.³⁰ To determine readiness to return to play following a concussion, it is first essential for baseline testing to be conducted prior to the start of the athletic season. Baseline tests can include self-reported symptoms, neurocognitive testing, and physical examination.³¹ Following injury, re-testing the concussed athlete can assist the AT and team physician in making an appropriate return to play decision.

Even though concussions may occur less frequently, the injuries often produce more significant health risks.¹ Concussions may also be the one injury that has specific return to play guidelines, however, there is still a lot of subjectivity within the recommendations. Only after normal clinical findings, the resolution of concussion-related symptoms, and the return to pre-injury scores on tests of motor control and neurological function should the physical exertion progression begin.³¹ The consensus statement on concussion in sport discusses a stepwise process for the graduated return to participation. The athlete should only continue to the next phase if the patient remains asymptomatic at the current level. The six phases are as follows: (1) no activity, (2) light

aerobic exercise, (3) sport-specific exercise, (4) non-contact training drills, (5) full-contact practice, and (6) return to normal game play.³² Each step should take about 24 hours or approximately one week to proceed through the full rehabilitation protocol.³² If post-concussion symptoms occur, the athlete should take a step back in the progression to the previous asymptomatic level and try to progress after a 24 hour rest period has passed.³² Healthcare providers are encouraged to evaluate the patient for common affective symptoms associated with traumatic brain injuries such as depression and anxiety.

Prior to the occurrence of a musculoskeletal injury or concussion, the sports medicine team should have a strategy for returning the athlete to play. The process must protect the athlete's health and safety and should be in compliance with existing local, institutional, and/or governing body safety regulations.³³ This in turn allows the athlete, ATs, coaches, and other individuals related to the care of the athlete to communicate effectively on the process of return to play. Generally, sports medicine professionals should consider: tissue healing, restoration of functionality, restoration or sport-specific skills, the presence of risk, and the psychological state of the athlete prior to returning the athlete to sport.

Psychological Considerations of Return to Play

For most injured athletes, the main goal following injury is to successfully return to play as quickly as possible. Research indicates that the success of the athlete's recovery and return to play following injury, may be related to the extent to which coach, sports medicine professionals, and significant others nurture the athletes' psychological needs.³⁴ A study performed by Podlog and Eklund³⁴ was one of the first attempts at

examining the magnitude in which athletes perceive their success in returning to sport. Several aspects of a successful return were noted in the study including: a return to pre-injury levels and attaining pre-injury goals; staying on the “right” path; creating realistic expectations of post injury performance; a feeling of self-satisfaction; an absence of injury related concerns and remaining uninjured; and finally, the ability to overcome adversity.³⁴

An aspect that has been shown to hinder a full and successful return is a fear of re-injury. This has been described as hesitation, holding back, giving less than maximal effort, being wary of injury-provoking situation and strapping the injury body part when participating in sport.³⁵ Sports performance and satisfaction with performance can be affected by behaviors such as these. Knowing whether fear of re-injury exists beyond the return to sport phase is also important.³⁵ Researchers also noted that the reported fear increases as athletes’ approach returning to sport.^{12,18} A study found that injuries that are considered major, defined as time loss greater than three weeks, resulted in greater fear of returning to sport among injured athletes than moderate or minor injuries.³⁶ Time loss is defined as the time between the original injury and return to play at a level that would allow competition participation.² When examining the influence of time loss and fear of re-injury when returning to sport, the researcher found that about 23.7% of injuries produced moderate to severe fear of re-injury while 14% of athletes reported a moderate to severe fear of returning to sport.³⁶

Athletes may have anxieties concerning return to play and possible re-injury.¹³ Confidence in returning to play is often regained at different points during the athlete’s rehabilitation. Therefore, knowing if cognitive and emotional readiness is a concern

amongst the athletic population can be advantageous to sports medicine professionals. Furthermore, by monitoring both the athlete's physical and psychological readiness to return to play, ATs can determine a more appropriate time to clear the athlete for full participation.

Measuring Psychological Readiness to Return to Play

Confidence in sport has been well researched, however, the scales have been inadequate in measuring confidence after athletic injury. Therefore, the Injury Psychological Readiness to Return to Sport Scale (I-PRRS) was developed. The questionnaire is a 6-item scale that measures the psychological readiness of injured athletes to return to competition.¹³ When compared to pre-existing scales, the Profile of Mood States (POMS) short form and the Total Mood Disturbance (TMD) score, the I-PRRS scores were negatively correlated with the TMD score or the POMS short form at all-time intervals, showing concurrent validity.¹³ The I-PRRS scores were lowest after injury, increased before practice, and then increased again before competition, however, there was no change after competition. External validity ($p < 0.001$) was also demonstrated for the I-PRRS scale as it was completed by the athlete and the respective AT, and was positively correlated.¹³ This scale is reliable for measuring psychological readiness after injury (0.93), before practice (0.92), before competition (0.78), and after competition (0.80).¹³ This scale can be a helpful tool for ATs to assess the athlete's psychological state and readiness to return to play after injury.

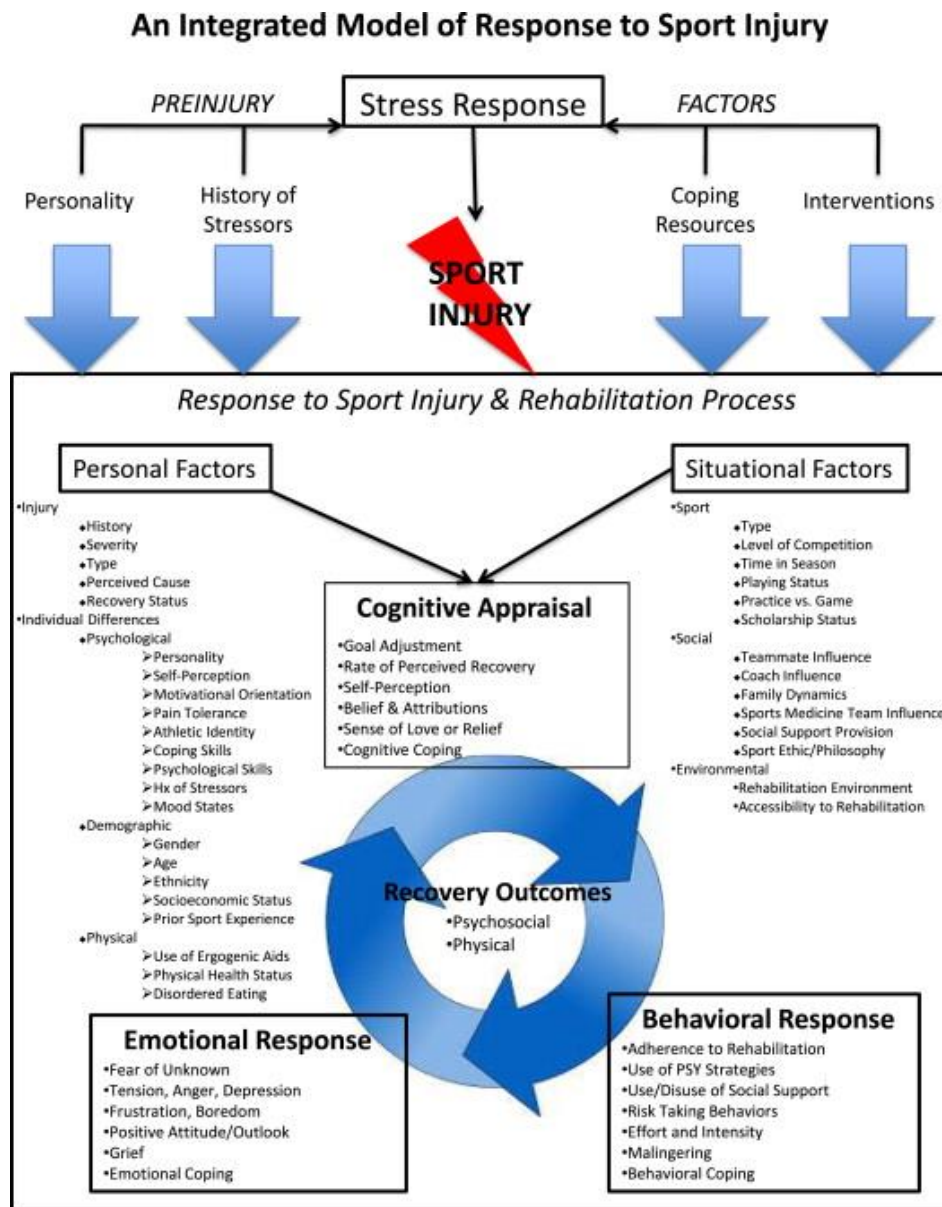
Literature has also shown that poor adherence to rehabilitation protocols may be associated with worsening of clinical and functional rehabilitation outcomes. Poor adherence could prolong the rehabilitation process or lead to a premature return to

participation.³⁷ Prior to the study by Podlog and colleagues, no measure of over-adherence existed to correlate adherence and risk of premature return to sport. The study examined both high school and collegiate athletes with The Rehabilitation Over-adherence Questionnaire.³⁷ The questionnaire used an adapted version of the I-PRRS to assess the tendency to risk a premature return to sport. The authors found that the first factor, ignoring practitioner's recommendations, suggestions, and guidelines, is consistent with previous literature.³⁷ Another factor associated with rehabilitation adherence is the attempt to expedite the process. An over-adherence measure can assist ATs in identifying athletes who are potentially at risk for rehabilitation setbacks and negative clinical outcomes.³⁷ Athletes with a high athletic identity may be at greater risk of risky rehabilitation behaviors, specifically over-adherence and willingness to risk a premature return to play. The identification of these athletes can indicate the need for psychological intervention or referral to another healthcare professional.³⁷

The Athlete Fear Avoidance Questionnaire (AFAQ) is a valid ($p = 0.05$) and reliable (0.80) scale that can be used to assess fear avoidance in an athletic population that copes with pain differently than the general population.³⁸ The scale is a 10-item questionnaire that measures sport-injury related fear avoidance in athletes. When compared to the Fear Avoidance Beliefs Questionnaire for the physically active and the Pain Catastrophizing Scale, significant correlations ($p < 0.001$) established concurrent validity.³⁸ The scale can be used to identify potential psychological barriers to rehabilitation and return to play.

APPENDIX C

INTEGRATED MODEL OF REPOSE TO SPORT INJURY AND REHABILITATION PROCESS



Reprinted from: 7,39

APPENDIX D**DEMOGRAPHIC FORMS AND QUESTIONNAIRES****Student-Athlete Demographic Form**

Participant ID: _____ Date: _____

Participant Name: _____

Gender: M F

Date of Injury: _____

Age: _____

Date of Expected Return: _____

Sport: _____

Please circle one: Injury Re-injury

Athletic Year: _____

Athletic Trainer providing care: _____ *(If multiple, the primary
Athletic Trainer you work with)*

Athletic Trainer Demographic Form

Participant ID: _____

Date: _____

Participant Name: _____

Gender: M F

Years of Experience: _____

Please list psychology-based coursework taken:

Have you taken mental health or psychology-based continuing education seminars?

Y N

If yes, please list:

Do you have previous clinical experience with injury-related psychological concerns?

Y N

If yes, please provide an example:

Athletic Trainer Questionnaire

Athlete Code: _____

IRB: _____

Certified Athletic Trainer:

To what degree did you consider psychological readiness when making your decision to return to play for this specific athlete?

Not at All	Unsure	Slightly	Moderate	A Great Deal
0	1	2	3	4

If you would like to explain your answer to the above question, please do so below:

Injury Psychological Readiness to Return to Sport (I-PRRS)

Please rate your confidence to return to your sport on a scale from 0 to 10

0 = no confidence at all

5 = moderate confidence

10 = complete confidence

1. My overall confidence to play is:

0 1 2 3 4 5 6 7 8 9 10

No Confidence

Complete Confidence

2. My confidence to play without pain is:

0 1 2 3 4 5 6 7 8 9 10

No Confidence

Complete Confidence

3. My confidence to give 100% effort is:

0 1 2 3 4 5 6 7 8 9 10

No Confidence

Complete Confidence

4. My confidence to not concentrate on the injury is:

0 1 2 3 4 5 6 7 8 9 10

No Confidence

Complete Confidence

5. My confidence in the injured body part to handle demands of the situation is:

0 1 2 3 4 5 6 7 8 9 10

No Confidence

Complete Confidence

6. My confidence in my skill level/ability is:

0 1 2 3 4 5 6 7 8 9 10

No Confidence

Complete Confidence

Name:

Sport:

Date:

Athletic Fear Avoidance Questionnaire (AFAQ)

Instructions: We are interested in your feelings or thoughts when in pain as a result of a sport injury. Using the following scale, please indicate the degree to which you have these thoughts and feelings when you are in pain due to a sports injury.

Rating	1	2	3	4	5
Meaning	Not at all	To a slight degree	To a moderate degree	To a great degree	Completely agree

Statement	Rating
1. I will never be able to play as I did before my injury	
2. I am worried about my role with the team changing	
3. I am worried about what other people will think of me if I don't perform at the same level	
4. I am not sure what my injury is	
5. I believe that my current injury has jeopardized my future athletic abilities	
6. I am not comfortable going back to play until I am 100%	
7. People don't understand how serious my injury is	
8. I don't know if I am ready to play	
9. I worry if I go back to play too soon I will make my injury worse	
10. When my pain is intense, I worry that my injury is a very serious one	

Geoffrey Dover and Vanessa Amar (2015) Development and Validation of the Athlete Fear Avoidance Questionnaire. *Journal of Athletic Training*: June 2015, Vol. 50, No. 6, pp. 634-642.

APPENDIX E

INSTITUTIONAL REVIEW BOARD DOCUMENTS

Georgia Southern University Office of Research Services & Sponsored Programs	
Institutional Review Board (IRB)	
Phone: 912-478-5465	Veazey Hall 3000
	PO Box 8005
Fax: 912-478-0719	Statesboro, GA 30460
	IRB@GeorgiaSouthern.edu

To: Monahan, Alyssa; Mutchler, Jessica; Hunt, Tamerah; Harris, Brandon; Belson, Emily; Brown, Natalie

From: Office of Research Services and Sponsored Programs

Initial Approval Date: 7/20/2017

Expiration Date: 6/30/2018

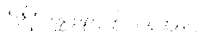
Subject: Status of Application for Approval to Utilize Human Subjects in Research – Expedited Process

After a review of your proposed research project numbered **H18001** and titled "**Psychological Readiness to Return to Play Following Injury in Division I Collegiate Athletes**" it appears that (1) the research subjects are at minimal risk, (2) appropriate safeguards are planned, and (3) the research activities involve only procedures which are allowable. You are authorized to enroll up to a maximum of 134 subjects.

Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that the Institutional Review Board has approved your proposed research. Description: The purpose of this study is to investigate the psychological readiness of the athlete to return to play following injury, and the degree to which psychological readiness was considered by the athletic trainer.

If at the end of this approval period there have been no changes to the research protocol; you may request an extension of the approval period. In the interim, please provide the IRB with any information concerning any significant adverse event, **whether or not it is believed to be related to the study**, within five working days of the event. In addition, if a change or modification of the approved methodology becomes necessary, you must notify the IRB Coordinator **prior** to initiating any such changes or modifications. At that time, an amended application for IRB approval may be submitted. Upon completion of your data collection, you are required to complete a *Research Study Termination* form to notify the IRB Coordinator, so your file may be closed.

Sincerely,



Eleanor Haynes
Compliance Officer

Georgia Southern University Office of Research Services & Sponsored Programs		
Institutional Review Board (IRB)		
Phone: 912-478-5465		Veazey Hall 3000
		PO Box 8005
Fax: 912-478-0719	IRB@GeorgiaSouthern.edu	Statesboro, GA 30460-8005

To: Monahan, Alyssa; Mutchler, Jessica; Hunt, Tamerah; Harris, Brandon; Belson, Emily; Brown, Natalie

From: Office of Research Services and Sponsored Programs
Administrative Support Office for Research Oversight Committees (IACUC/IBC/IRB)

Date: 10/9/2017

Expiration Date: 6/30/2018

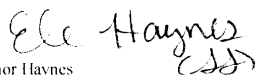
Subject: Status of Research Study Modification Request – Amendment # 1

After a review of your Research Study Modification Request on research project numbered **H18001** and titled "**Psychological Readiness to Return to Play Following Injury in Division 1 Collegiate Athletes**" your request for modification appears that (1) the research subjects are at minimal risk, (2) appropriate safeguards are planned, and (3) the research activities involve only procedures which are allowable.

Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that the Institutional Review Board has approved your modification request. Description: Change "Emily Brown" to "Emily Belson" in all consent forms.

The expiration date of your original application approval remains in effect. If additional time beyond your expiration date is required to complete your data collection and analysis and there have been no further changes to the research protocol, you may request an extension of the approval period. If your project will require approval beyond 36 months from the initial approval date, a new submission and review will be required. In the interim, please provide the IRB with any information concerning any significant adverse event, **whether or not it is believed to be related to the study**, within five working days of the event. In addition, another change or modification of the approved methodology becomes necessary, you must notify the IRB Coordinator **prior** to initiating any such changes or modifications. At that time, an amended application for IRB approval may be submitted. Upon completion of your data collection, you are required to complete a *Research Study Termination* form to provide the final information to allow your file to be closed.

Sincerely,



Eleanor Haynes
Compliance Officer

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