




2021

## Helping the Have-Nots: Examining the Relationship Between Rehabilitation Adherence and Self-Efficacy Beliefs in ACL Reconstructed NAIA and NCAA DII and DIII Female Athletes

Myles Tutin Englis

*University of Kentucky*, [englis.myles@gmail.com](mailto:englis.myles@gmail.com)

Author ORCID Identifier:

 <https://orcid.org/0000-0002-7009-9275>

Digital Object Identifier: <https://doi.org/10.13023/etd.2021.243>

[Right click to open a feedback form in a new tab to let us know how this document benefits you.](#)

### Recommended Citation

Englis, Myles Tutin, "Helping the Have-Nots: Examining the Relationship Between Rehabilitation Adherence and Self-Efficacy Beliefs in ACL Reconstructed NAIA and NCAA DII and DIII Female Athletes" (2021). *Theses and Dissertations--Kinesiology and Health Promotion*. 85.  
[https://uknowledge.uky.edu/khp\\_etds/85](https://uknowledge.uky.edu/khp_etds/85)

This Master's Thesis is brought to you for free and open access by the Kinesiology and Health Promotion at UKnowledge. It has been accepted for inclusion in Theses and Dissertations--Kinesiology and Health Promotion by an authorized administrator of UKnowledge. For more information, please contact [UKnowledge@lsv.uky.edu](mailto:UKnowledge@lsv.uky.edu).

## **STUDENT AGREEMENT:**

I represent that my thesis or dissertation and abstract are my original work. Proper attribution has been given to all outside sources. I understand that I am solely responsible for obtaining any needed copyright permissions. I have obtained needed written permission statement(s) from the owner(s) of each third-party copyrighted matter to be included in my work, allowing electronic distribution (if such use is not permitted by the fair use doctrine) which will be submitted to UKnowledge as Additional File.

I hereby grant to The University of Kentucky and its agents the irrevocable, non-exclusive, and royalty-free license to archive and make accessible my work in whole or in part in all forms of media, now or hereafter known. I agree that the document mentioned above may be made available immediately for worldwide access unless an embargo applies.

I retain all other ownership rights to the copyright of my work. I also retain the right to use in future works (such as articles or books) all or part of my work. I understand that I am free to register the copyright to my work.

## **REVIEW, APPROVAL AND ACCEPTANCE**

The document mentioned above has been reviewed and accepted by the student's advisor, on behalf of the advisory committee, and by the Director of Graduate Studies (DGS), on behalf of the program; we verify that this is the final, approved version of the student's thesis including all changes required by the advisory committee. The undersigned agree to abide by the statements above.

Myles Tutin Englis, Student

Dr. Marc L. Cormier, Major Professor

Dr. Melinda Ickes, Director of Graduate Studies

HELPING THE HAVE-NOTS: EXAMINING THE RELATIONSHIP BETWEEN  
REHABILITATION ADHERENCE AND SELF-EFFICACY BELIEFS IN ACL  
RECONSTRUCTED NAIA AND NCAA DII AND DIII FEMALE ATHLETES

---

THESIS

---

A thesis submitted in partial fulfillment of the  
requirements for the degree of Master of Science in the  
College of Education  
at the University of Kentucky

By  
Myles Tutin Englis  
Lexington, Kentucky  
Director: Dr. Marc Louis Cormier, Associate Professor of Kinesiology and Health  
Promotion  
Lexington, Kentucky  
2021

Copyright © Myles Tutin Englis 2021  
<https://orcid.org/0000-0002-7009-9275>

## ABSTRACT OF THESIS

### Helping the Have-Nots: Examining the Relationship Between Rehabilitation Adherence and Self-Efficacy Beliefs in ACL Reconstructed NAIA and NCAA DII and III Female Athletes

Anterior cruciate ligament injuries are among the most common and traumatic sport-related injuries, and often negatively impact one's quality of life during and post-rehabilitation. For many NCAA Division I and professional female athletes, rehabilitation is streamlined with a multidisciplinary team, including sport psychology. For others (e.g., NAIA, NCAA Division II, III athletes) this may not always be the case, as many of these athletic programs may not have the resources to meet the various needs of injured and rehabilitating female student-athletes. In these instances, rehabilitation motivation, adherence, and success may be more dependent on the athletes' individual resources and personalities, as compared to their Division I and professional counterparts. With so many more women athletes competing at this level across the U.S., a better understanding of ACL injury rehabilitation and return to sport with limited resources is warranted. Thus, the purpose of this study was to examine what factors related to motivation and self-efficacy contribute to a successful rehabilitation for NAIA and NCAA Division II and III female athletes following ACL reconstruction. Qualitative interviews were used to investigate personal factors, as well as cultural and social elements that impact adherence to rehabilitation protocols and ultimately, recovery.

**KEYWORDS:** [Sport Psychology, Injury Rehabilitation, Self-efficacy, Rehabilitation Adherence, ACL Reconstruction, Women's Sports]

---

Myles Tutin Englis

---

7/12/2021

---

Helping the Have-Nots: Examining the Relationship Between Rehabilitation Adherence  
and Self-Efficacy Beliefs in ACL Reconstructed NAIA and NCAA DII and DIII Female  
Athletes

By  
Myles Tutin Englis

Dr. Marc Cormier, PhD

---

Director of Thesis

Dr. Melinda Ickes, PhD

---

Director of Graduate Studies

7/12/2021

---

Date

## DEDICATION

*To the athletes who shared their stories with me.*

## ACKNOWLEDGEMENTS

In appreciation for their support and guidance throughout the work represented by this thesis as well as throughout my master's training, I thank the members of my committee, Dr. Marc Cormier, Dr. Shelby Baez, and Dr. Heather Erwin. I am incredibly thankful for their patience and thoughtful advice throughout this process. I will look back on my time at the University of Kentucky as a student with fond memories.

For their assistance in letting me talk about this project and give me suggestions where needed, I'd also like to thank Rena Curvey, Shannon White, and Travis Schedler. I am very thankful for the expertise they shared with me.

Without the love and support of Dani Pulgini, this thesis would have been far more difficult. Dani always believed in my writing abilities and most importantly, she was always there to share my joy and my sorrow.

Finally, a big thank you to my parents Judy Tutin and Basil and Paula Englis. I love them all dearly. They are always valuable sources of instruction and would always put my writing challenges into perspective with a comment like, "Imagine doing a project like this in 1983 like me." I love you all.

## TABLE OF CONTENTS

<i>TITLE</i> .....	<i>I</i>
<i>ABSTRACT OF THESIS</i> .....	<i>2</i>
<i>ACKNOWLEDGEMENTS</i> .....	<i>iii</i>
<i>TABLE OF CONTENTS</i> .....	<i>iv</i>
<i>LIST OF TABLES</i> .....	<i>vi</i>
<i>CHAPTER 1. Introduction and Research Purpose</i> .....	<i>1</i>
1.1 Purpose Statement.....	6
1.1.1 Research Questions .....	6
1.1.2 Hypothesis.....	6
<i>CHAPTER 2. Review of Literature</i> .....	<i>7</i>
2.1 Theoretical Framework .....	7
2.1.1 Self-Efficacy Theory .....	7
2.1.2 Self-Determination Theory .....	8
2.1.3 Biopsychosocial Model.....	10
<i>CHAPTER 3. Method</i> .....	<i>12</i>
3.1 Participants and Recruitment .....	12
3.2 Research Type and Data Analysis .....	13
3.3 Measures .....	14
3.3.1 Interviews.....	14
3.3.2 General Rehabilitation Adherence Scale (GRAS).....	14
3.4 Procedure .....	15
3.4.1 Bias, Trustworthiness, and Validity .....	17
<i>CHAPTER 4. Results</i> .....	<i>19</i>
4.1 Nature of the Data.....	20
4.2 Athlete Characteristics and Experiences.....	21
4.2.1 Athlete Make-Up .....	22
4.2.2 Previous Injury.....	24
4.3 Cost.....	24
4.3.1 Identity Struggles .....	25
4.3.2 Limiting Separation .....	28
4.3.3 Loss of Control .....	30
4.4 Interventions and Psychological Resources .....	32
4.4.1 Vicarious Experiences .....	32
4.4.2 Social Support.....	34
4.4.3 Psychological Resources.....	38
4.5 Summary .....	41



<i>CHAPTER 5. Discussion</i> .....	45
5.1 Athlete Characteristics and Experiences.....	45
5.2 Cost.....	50
5.3 Interventions and Psychological Resources.....	57
5.4 Study Summary.....	68
5.5 Conclusions.....	71
5.6 Practical Implications.....	73
5.7 Limitations.....	75
5.8 Recommendations for Future Research.....	76
<i>Appendix A</i> .....	78
<i>Appendix B</i> .....	79
<i>Appendix C</i> .....	80
<i>Appendix D</i> .....	81
<i>Appendix E</i> .....	83
<i>Appendix F</i> .....	84
<i>Appendix G</i> .....	85
<i>Appendix H</i> .....	86
<i>Appendix I</i> .....	87
<i>Appendix J</i> .....	88
<i>Appendix K</i> .....	89
<i>References</i> .....	93
<i>Vita</i> .....	112

LIST OF TABLES

Table 1. *Participant Demographics*..... 19

## CHAPTER 1. INTRODUCTION AND RESEARCH PURPOSE

Due to the countless hours dedicated to training and competition, athletes are at significantly higher risk of injury than standard exercisers and non-athletes (Brewer, 2009). While the risk and frequency of injury depend largely on factors such as sport, competition level, sex of the athlete, age, and even environmental circumstances, research has consistently shown that athletes are likely to sustain an injury at some point during their careers (e.g., Azuara et al., 2014; Hurtubise et al., 2015; Padegimas et al., 2016). For example, Vitali (2011) revealed that between 70% and 80% of professional female gymnasts sustain an injury each season while approximately 75% of both professional men and women football (soccer) players sustain an injury each season. Similarly, Donskov and colleagues (2019) revealed an injury incidence rate ranging between 13.8 and 121 injuries per 1,000 in game hours in elite men's ice hockey. Though injuries vary in severity and type, injury to the anterior cruciate ligament (ACL), is among the most common, debilitating, and traumatic sports-related injury and has the potential to significantly decrease an individual's quality of life during and post-rehabilitation (e.g., Filbay et al., 2016; Mainwaring et al., 2010). Athletes are often unable to return to sport after ACL reconstruction (ACLR), even following successful rehabilitation (Jerre et al., 2001; Nyland et al., 2002; White et al., 2013). This is due in part to high rates of reinjury (Ahlden et al., 2012), ACL graft failure (van Eck et al., 2012), and psychological factors such as not trusting the knee or a fear of reinjury (Ardern et al., 2014; Ardern et al., 2013). Indeed, sport injury rehabilitation is a long and arduous process that an injured athlete is rarely fully mentally prepared to endure (Heijne et al., 2008). Specific to ACLR, of which there are more than 120,000 of in the United

States annually (Mall et al., 2014), 81% return to any level of sport and only 55% return to competitive sport (Ardern et al., 2014). In addition, an estimated 50.9 per 100,000 children aged 10-19 undergo ACLR yearly (Dodwell et al., 2014), with that number increasing approximately 2.3% yearly (Beck et al., 2017).

ACL injuries and subsequent reconstruction do not exclusively impact physical capabilities alone. More recent sport injury research (e.g., Ivarsson et al., 2017) has demonstrated how physical and psychological trauma are not mutually exclusive. Rather, they often occur in unison. Injuries that impact critical body parts, such as knee ligaments, inflict both physical and emotional distress (Rahr-Wagner et al., 2014). Sport-related injuries have significant psychological impacts such as increasing life stress, increasing fear of reinjury, grief, and several other mood disturbances (e.g. Naoi & Ostrow, 2008; Vergeer, 2006). This is largely due to individual psychological factors, or cognitive appraisals, which will dictate how athletes will cope with a sport-injury (Roy et al., 2015). Negative emotions and cognitive appraisals related to injury are associated with elongated rehabilitation periods (Heaney et al., 2016), decreased motivation to participate in rehabilitation sessions (Clement et al., 2015), and increased risks of reinjury (Tracey, 2003). Roy and colleagues' (2015) and Tripp and colleagues' (2007) findings also support the idea that a negative psychological response to injury is linked to suboptimal rehabilitation adherence and rehabilitation outcomes. Therefore, properly understanding and managing an athletes' psychological reactions to injury can facilitate recovery and return to play and aid athletes in adjusting to potential role changes (Egan & Freeman, 2020).

Ivarsson and colleagues (2017) note that an athlete's interpretation of being injured will influence the magnitude of their negative responses. The magnitude of these negative responses is suggested to influence an athlete's behavior, which in the case of the present study is rehabilitation adherence. Although, if the injured athlete follows their rehabilitation plan and adheres to it closely, the likelihood of recovering from an ACL injury setback is considerably higher (Paterno et al., 2019). Despite advances in rehabilitation techniques, reinjury and return to sport rates after ACLR are disappointing (Culvenor & Barton, 2018), thus highlighting the need to enhance the recovery process.

The psychological aspect of ACLR rehabilitation has received little attention. A considerable amount of the research around ACL injury rehabilitation has been placed on the physical aspects of rehabilitation, while the psychological aspects tend to be ignored (Carson & Polman, 2008; Maddison et al., 2011; McArdle, 2010). Previous injury-related research (e.g., Ardern et al., 2012; Doorley & Womble, 2019; Thomeé et al., 2007) has called for an exploration into whether recreational, high school, college, professional, or Olympic athletes possess the highest levels of self-efficacy during treatment. Additionally, their research has revealed a need for understanding the determinants of these athletes' self-efficacy. More specifically, further examination of behavior change and self-efficacy sustainability is needed to guide practitioners and continue the conversation for how to mitigate the deleterious effects of sport-injury, specifically in ACLR rehabilitation. Furthermore, Thomeé and colleagues (2007) have called for further research in the field to accurately understand self-efficacy and its role in sport injury rehabilitation. Higher levels of self-efficacy may lead to increased adherence and postoperative compliance after ACLR (Levinger et al., 2017; Mendonza et al., 2007). In

other injury-related research, Doorley and Womble (2019) note the potential for self-efficacy differences in athletic populations due to sport-related factors such as athletic performance, successful return to sport after an injury, and social support from teammates and coaches.

Depending on an athlete's competitive level or age, successful rehabilitation and returning to sport can carry varying levels of importance. In 2003, Brewer and colleagues concluded that for adolescent athletes, high levels of athletic identity coupled with a high desire to return to sport would positively influence rehabilitation adherence post-ACLR. In 2015, Christino and colleagues found evidence showing that social support and self-motivation were most important for adult athletes in adhering to rehabilitation post-ACLR. This gap in the research needs to be filled, as collegiate athletes fall right in between these two categories almost in a transition period from one to the other.

Due to national visibility through the media, in conjunction with financial pressure associated with college and the prospect of possible professional draft selection being dashed because of injury, college athletes and their rehabilitation processes are an important population to study. Additionally, athletes post-ACLR may have supplementary rehabilitation concerns due to higher preoperative mood disturbances, potential pain intolerance, preoperative anxiety, and instances of catastrophizing (Tripp et al., 2004). Furthermore, participation in National Association of Intercollegiate Athletics (NAIA) and National Collegiate Athletic Association (NCAA) Division II and III athletics has increased significantly, with 118,000 athletes competing at the Division II level, 188,000 athletes competing at the Division III level, and 50,000 athletes competing at the NAIA level (NCAA, 2014). The increase in participants has also contributed to an

increase in the number of injuries sustained in collegiate sports. While injury incidence varied widely per sport, injury rates ranged from 2.1 to 39.9 injuries per 1,000 hours of sport exposure (Kerr et al., 2015). By understanding which areas of self-efficacy theory to focus on for each individual, athletes and practitioners can use best practice to have a successful recovery, however “successful” is defined for that athlete.

Self-efficacy differences when recovering from injury are not exclusive to sport-related factors, however. Lissee and colleagues (2020) have addressed how gender differences are evident in individuals recovering from ACLR. Specifically, females are notably less likely to return to sport than males following ACLR (Ardern et al., 2014). While anatomical differences may play a significant role, the smaller likelihood of returning to sport may also be due to a disconnect among patient goals and rehabilitation approaches, for example (Lissee et al., 2020). Currently, males and females receive similar treatment for ACLR and are often evaluated the same way when measuring readiness to return to sport (Lissee et al., 2020). This is problematic because female athletes have reported more psychological distress, lower levels of self-efficacy, and a greater internal locus of control than men when recovering from ACLR (Sims & Mulcahey, 2018). As such, findings from Lisee and colleagues have suggested that these psychological differences should be addressed when implementing interventions to improve rehabilitation outcomes and readiness to return to sport. Due to these psychological differences and the need to address male and female athletes differently as they rehabilitate, it is important to comprehensively understand the rehabilitative process through an exclusively female lens, rather than through a mixed sample.

## 1.1 Purpose Statement

With the current study, the findings will help athletes and practitioners determine best practices to enhance rehabilitation adherence for female athletes recovering from long-term injuries like ACLR. This study also served as a preliminary exploration into what groups of athletes exhibit the highest levels of self-efficacy before and during ACLR injury rehabilitation. Therefore, the purpose of this research was to better understand the impact of self-efficacy tenets as they relate to motivation and rehabilitation outcomes in female athletes post-ACLR. To support the exploration of self-efficacy in this population, a focus on the psychological and social factors and motivational climate, both intrinsic and extrinsic, which influence healthcare and rehabilitation outcomes are necessary. Therefore, self-efficacy theory was supplemented by use of self-determination theory and the biopsychosocial model.

### 1.1.1 Research Questions

- What is the relationship between self-efficacy and adherence to rehabilitation for female NCAA Division II and III collegiate athletes post-ACLR?
- For the female athletes who adhered to their rehabilitation plans and had a successful return to play, what coping mechanisms and techniques did they find most impactful in their recovery process?

### 1.1.2 Hypothesis

- Due to the exploratory nature of the qualitative purpose, no hypothesis was made.



## CHAPTER 2. REVIEW OF LITERATURE

### 2.1 Theoretical Framework

#### 2.1.1 Self-Efficacy Theory

Self-efficacy refers to “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p.3), which in this case is an optimal rehabilitation outcome. Crossman (2001) has suggested that self-efficacy is of paramount importance for rehabilitation outcomes after a sport-related injury. Although self-efficacy theory (SET) (see Appendix A) was not initially intended to be used in the injury context, Crossman offers recommendations for it to be used with injured athletes. Performance attainment, verbal and social persuasion, imitation and modeling, and judgements of physiological states each contribute to the self-efficacy of an injured athlete (Olmedilla et al., 2018). Crossman further summarizes those categories by stating that athletes need to be provided with a belief that they can perform the necessary activities, be able to identify potential roadblocks in rehabilitation, find role models, and recall examples of successful experiences that can be verbally attributed to their current efforts in rehabilitation.

SET continues to be hailed as one of the most influential mental constructs driving achievement in sport (Saville & Bray, 2016). Given SET’s role in individual motivation, it has presumed linkages to the achievement orientation most commonly associated with exercise adherence (Jackson, 2010). Additionally, SET views individuals as proactive agents in regulation of cognition, motivation, actions, and emotions, rather than as reactors to their environment (Feltz, Short, & Sullivan, 2008). By mediating between self-appraisal information and people’s thought patterns, SET helps to foster an environment where athletes act on their motivated behaviors to achieve their goals

(Bandura, 1986, 1997). In this context, SET will frame the exploration of the adherence of athletes to their ACLR rehabilitation program.

Few studies have explored the factors contributing to self-efficacy in athletes post-ACLR. However, the limited research has identified a strong relationship between self-efficacy and significant improvements in performance for patients rehabilitating an ACL injury (Thomeé et al., 2006). By understanding what specific factors relating to self-efficacy are responsible for this impact, rehabilitation results may be further improved (Thomeé et al., 2007). It has been hypothesized that perceived self-efficacy could be determined by coping mechanisms, previous experiences with injury, quality of life, and physical function of the knee post-injury (Thomeé et al., 2007). However, SET has rarely been used in conjunction with patients post-ACLR. This research will contribute to the literature by seeking out which self-efficacy needs should be strengthened or focused on at certain points of the rehabilitation process to encourage athletes to adhere to their rehabilitation plans. Sweet and colleagues' (2012) findings support the idea that SET variables are linked with self-determined motivation. Further, their research posits that satisfying the three psychological needs of self-determination theory (Deci & Ryan, 2000) with an emphasis on autonomy, an individuals' confidence, perception of positive outcomes, and self-determined motivation will increase.

### 2.1.2 Self-Determination Theory

Reis and colleagues' (2000) research on self-determination theory (SDT) (see Appendix B) shows the significance of basic psychological need satisfaction for well-being and other positive outcomes. According to Deci and Ryan (2000), the satisfaction of an individual's three basic psychological needs, competence, relatedness, and

autonomy, defines the quality of his or her motivations. When individuals feel more autonomous, competent, and related, the more likely they are to be intrinsically motivated and self-determined (Deci & Ryan, 2000). Chan and colleagues (2009, 2011) have applied SDT in the context of sport injury rehabilitation and athlete motivation toward rehabilitation. In injury rehabilitation plan adherence, Deci and Ryan's (2000) research on SDT focuses on the social and contextual factors that support health, psychological well-being, and self-motivation. Their research postulates that the actions people take are facilitated by several different forms of motivation, not strictly intrinsic, and that motivation moves along a continuum. Chan and colleagues (2011) and Podlog and Eklund (2007) expand on this by noting that autonomous support and autonomous motivation are very strongly related to treatment adherence as well as key factors for a smoother transition back into sport following an injury. Feeling confident or efficacious in one's abilities to attain a goal is only one part of the process, while having basic psychological needs fulfilled is another component. Identifying the malleable factors related to behavior is important to help facilitate an athlete's adherence to their rehabilitation plan.

Although research has connected SDT to predicting injury-related behavior such as adherence to rehabilitation plans or motivation (e.g., Hagger & Chatzisarantis, 2009), SDT has been criticized for not comprehensively detailing how other factors like beliefs, feelings of control, and planning may impact the behaviors themselves (Hagger et al., 2002). Because of this, using SET in conjunction with SDT will bridge the gap between components like belief and control. In sum, the value from using SDT will come from findings that show the impact on health, well-being, and performance outcomes from the

different types of motivation as well as the importance of creating an environment helpful in fulfilling the three psychological needs of autonomy, relatedness, and competence for patients post-ACLR.

The goal of simultaneously utilizing SET and SDT is not to compare the two or put them against one another. Rather, by incorporating constructs of the two theories, sport psychology practitioners can better understand the underlying components of behavior change (Biddle et al., 2007). A majority of rehabilitation is voluntary in nature, meaning that it requires some degree of athlete involvement and individual behavior change to complete (Whyte et al., 2019). SET and SDT orient well together because they are based on the tenet that humans are proactive agents of their actions (Sweet et al., 2012). Both theories operate on the understanding that humans possess complex internal structures which allow them to make their own choices (Sugarman & Sokol, 2012). In SET, individuals persist when they feel capable to attain a goal while SDT posits that relatedness, competence and subsequent feelings of capability, and autonomy are important for motivation. If an individual feels autonomous and capable, the likelihood of behavior change and sustainability is greater, which makes self-determined motivation the main element of the agent (Sweet et al., 2012).

### 2.1.3 Biopsychosocial Model

Research demonstrates a clear link between the physical and psychological components of sport-injury rehabilitation. Brewer and colleagues' (2002) biopsychosocial model (see Appendix C) ties the environmental, physiological, psychological aspects of injury together to help researchers understand and address the whole person. The biopsychosocial model, which draws upon approaches often utilized

by healthcare professionals, posits that health, illness, and injury are best acknowledged in terms of an interaction between biological, psychological, and social factors (Brewer et al., 2002). By addressing these critical components of an injured athlete, Heaney and colleagues (2012) hypothesize that the biopsychosocial model can positively impact patient satisfaction, individual empowerment, and pain management. Andersen (2001) supports this theory by stating that the process to return an athlete from injury is both complicated and multifaceted. Brewer and colleagues (2002) highlight the seven components of the model which are: the characteristics of the injury, sociodemographic factors, biological, psychological, and contextual factors, as well as biopsychological outcomes and sport injury rehabilitation outcomes. Moreover, the aforementioned factors which the model is comprised of each influence one another (Brewer et al. 2002).

The biopsychosocial model has both positives and negatives. A key strength is that the model acknowledges that recovery from sport-injury occurs in a complex, changeable, and dynamic biological, psychological, and social environment (Andersen, 2007). However, while it does provide a structure for examining the factors impacting rehabilitation outcomes and offer information supporting the influence each factor has on another (Podlog & Eklund, 2007), it does not actually give an explanation for how the factors influence one another. Additionally, the model does not argue for which factors have been most significant for an athlete in rehabilitation. Although, this model does fit well with this research, as it is intended to focus on the time period between injury occurrence and the completion of rehabilitation, but not the post-rehabilitation time. This study will begin to fill in holes regarding how these factors interact with one another and which are most significant for patients post-ACLR.

## CHAPTER 3. METHOD

### 3.1 Participants and Recruitment

Upon approval from the Institutional Review Board, 13 National Association of Intercollegiate Athletics (NAIA) and National Collegiate Athletic Association (NCAA) Division II (DII) and Division III (DIII) athletes who have experienced ACL reconstructive surgery were contacted through their college or university athletic trainers. Following conversation with experienced researchers in the field, participants were eligible for the study if they suffered a unilateral ACL tear, have no history of ACL injury, no history of meniscal pathology, are 9-20 months post-surgery date, had been cleared to return to play, and the only injury to the knee was an ACL tear. Additionally, participants were only eligible if they were injured while playing a sport and are not seeking treatment for any other injury.

As part of a screening process for this study, of the 13 participants, 8 were invited to interview depending on their scores on the General Rehabilitation Adherence Scale (Naqvi et al., 2020). Only respondents with high adherence scores (scores above 16 out of a possible 24) were invited to interview with the researcher. Following the 8 interviews, 7 were used for data collection because one needed to be removed. It became apparent through one of the interviews that one participant's injury did not happen while competing in sport.

Demographics were collected from a demographic questionnaire (see Appendix D) such as age, gender identity, sport, time since injury, type of surgery, ACL graft type, and previous injury experiences. The purpose of this demographic survey was to ensure the utilization of a diverse group of student-athletes. A recruitment letter was included in the initial invitation (see Appendix E). This study used only female participants. HIPAA

compliant Zoom calls were the primary form of meeting with participants for this study. After receiving consent from the participant, the researcher contacted the participant via email to schedule an interview (see Appendix F).

The researcher's home university granted ethical approval and participants read and completed informed consent prior to any and all data collection.

### 3.2 Research Type and Data Analysis

For this research study, qualitative methods were utilized. The research was driven by semi-structured qualitative interviews (see Appendix H) and supplemented by the General Rehabilitation Adherence Scale (GRAS) (Naqvi et al., 2020) (see Appendix G). Following administration of the GRAS, athletes were selected and invited to participate in semi-structured interviews. Thematic content analysis (Braun & Clark, 2006) was employed in this study to analyze the raw interview data. Thematic analysis is a widely used methodology in qualitative research due ability to capture significant meaning within a data set (Guest et al., 2012) and helps to develop an account of the data from the researcher's perspective (Braun & Clark, 2006). The following six steps of thematic analysis were executed by the researcher to immerse themselves in the data, generate codes, and identify themes: familiarization with the data, generate initial codes, search for themes, review themes, define and name themes, and produce the report (Braun & Clark, 2006, p.87). In order to define and name themes in the data, the researchers followed the six steps outlined by Braun and Clark (2006). Following the familiarization with the data and generating initial codes, phases three through five were completed by finding, defining, and naming themes (Braun & Clark, 2006; Terry et al., 2017).

### 3.3 Measures

#### 3.3.1 Interviews

The consent form, recruitment letter, and demographic survey were submitted to the Institutional Review Board (IRB) to ensure that language is acceptable for use, with no deceiving or ambiguous language. Additionally, consent forms were emailed to potential participants and their university athletic trainers prior to the study for review. Colleges and universities were randomly selected from the NCAA and NAIA websites. Only colleges and universities who put their staff email addresses on the staff directory were contacted. Semi-structured interview guides, submitted to and approved by the IRB, contained ten open-ended questions. The interviews in the study lasted between 30 and 35 minutes. The researcher took notes, and the interviews were recorded with the Zoom recording feature. All interviews were then transcribed verbatim with minor edits, removing names, schools, and locations to assure confidentiality of the participants. Following the transcription of the interviews, the transcriptions were sent back to the participants for any necessary corrections. These recordings and transcriptions were stored on a password-protected encrypted machine and will be destroyed at the culmination of the retention period as dictated by the IRB.

#### 3.3.2 General Rehabilitation Adherence Scale (GRAS)

Considerable research has been conducted regarding adherence to home-based exercise and rehabilitation (e.g. Alexandre et al., 2002; Ben Salah Frih et al., 2009). However, Uzawa and Davis (2018) determined that only three of eight studies on the topic conducted between 1996 and 2015 used questionnaires as a measure of adherence rather than patient-reported diaries, which have the potential for recall bias. While the



utilization of questionnaire-based evaluations encourage movement in the right direction, there is still a need for validated tools to measure patient's adherence to rehabilitation and physical therapy. The General Rehabilitation Adherence Scale (GRAS) (See Appendix G) takes into account treatment exhaustion, attendance, pain during treatment, out-of-pocket expenses, and how some patients may not prioritize rehabilitation over other commitments. The ultimate goal of the GRAS is to measure adherence to physical therapy and rehabilitation with eight items with answers ranging from always to never.

Using the GRAS, participants will be classified as adherent or non-adherent by using Naqvi and colleagues' (2020) scale and scoring schema. Patients will fall between a range of titles such as 'highly adherent' (20-24), 'good in adherence' (17-19), 'partially adherent' (12-16), 'low adherence' (8-11), and 'poor adherence' (7 or less). Additionally, in the scoring system, 'always' registers as 4 points, 'mostly' registers as 3 points, 'sometimes' registers as 2 points, and 'never' registers as 1 point. The overall reliability of the GRAS is considered to be acceptable and it also demonstrated test-retest validity over time. This scale fits with this line of research primarily because it is based on self-report data from participants and also has a 'cut-off value' in the scoring system which designates patients as adherent or not, helping us label the participants.

### 3.4 Procedure

If interested and willing to participate, athletes contacted the researcher via email after receiving the advertisement and informed consent for the study from their college or university athletic trainers. If choosing to participate, the participant sent a response notifying the researcher as such. Upon receiving this information, the researcher answered any questions the participant had and then sent the GRAS and demographic

questionnaire via email. Any documents relating to the study were sent via email. Additionally, no patient information was obtained through medical records. All information was self-report from the student-athlete. After the student-athlete completed the GRAS and demographic questionnaire, the researcher contacted the participant about scheduling a time for the subsequent interview (see Appendix F) for those who qualified. The GRAS was used to understand which athletes were very adherent and those who were not. After each participant completed the GRAS, the 8 most adherent patients were contacted for a follow-up interview via Zoom. Because the purpose was to examine adherent behaviors as they related to self-efficacy, we selected the most adherent participants. Future research could examine less adherent student-athletes and why they behaved as such. The Zoom interviews lasted between 30 and 35 minutes.

The raw qualitative data was examined and analyzed through thematic analysis. Researchers' (Guest et al. 2012) findings have supported that thematic analysis is a practical method for finding meaning in qualitative data. Recordings were transcribed, and the researcher read the transcription of the interviews in order to refamiliarize themselves with the athlete's experiences. Names and places were removed to ensure privacy, and each participant had a pseudonym associated with their responses. During the review of the transcriptions, the researcher took detailed notes. Each line of the transcription was analyzed and then organized into themes. The researcher made connections between the themes pertaining to self-efficacy, motivation, and adherence to rehabilitation. This process was repeated for each participant who was interviewed. Themes were then investigated in order to find consistent or conflicting interpretations

and ideas of self-efficacy, motivation, and adherence to rehabilitation across all interviews.

Due to current limitations and to expand reach for potential participants, interviews took place via Zoom videoconferencing, due to Zoom's Health Insurance Portability and Accountability Act (HIPAA) compliance. The demographic questionnaire and GRAS were administered through Qualtrics. Some information from the interview and surveys was retrospective. Each of the interviews were audio recorded and then transcribed for data analysis. Each transcription and recording were stored on a password-protected, encrypted machine and will be destroyed when the IRB retention period ends.

#### 3.4.1 Bias, Trustworthiness, and Validity

In regard to trustworthiness and credibility, researchers addressed credibility by performing the data collection, partaking in extended periods of time engaging with the data, frequent data observation, and committing to researcher triangulation as outlined by Nowell and colleagues (2017). The first author created the semi-structured interview guide using existing relevant peer-reviewed research while remaining committed to the guiding theoretical framework. The first author conducted interviews and assisted two research assistants with manual transcription and reading of the transcripts to further familiarize themselves with the data. Researcher triangulation was operationalized throughout the several rounds of data analysis (Nowell et al., 2017). Researchers achieved data triangulation by interviewing several female NAIA and NCAA DII and DIII athletes who have experienced ACLR at different institutions with varying levels of access to resources. Salkind (2010) advocates for researcher triangulation in data analysis

as it demonstrates support for study rigor because multiple researchers partake in the analysis phases.

For the interviews, the first author recruited fellow graduate students to conduct two pilot interviews with advisor supervision to assure clarity and commitment to the topic, without having leading or closed-ended questions. The pilot interview participants were two former collegiate athletes who met more than half of the inclusion criteria. Each pilot interview participant offered feedback to the researcher. Pilot interview data was not included in the study. The researcher also consulted with experienced researchers in the field to review questions for content validity. Further, member checking was employed to ensure credibility by sending transcripts to participants in order to give them the opportunity to correct or adjust any answers they gave during the interview. Bias was addressed before and during the research process. Prior to interviews being conducted, the first author spoke with their advisor regarding the first author's experience with injury and minimizing social desirability by ensuring participant anonymity. Data saturation was determined by some of the final interviews offering no new themes and similar codes to previous interviews.

## CHAPTER 4. RESULTS

Thematic analysis procedures and the guiding theoretical framework of the study revealed the following categories of variables impacting motivation and adherence to rehabilitation. The following categories were constructed from the data: *athlete characteristics and experiences*, *cost*, and *interventions and psychological resources*. To start the section, there will be a brief summary of the data, followed by analysis of the three categories. Throughout the section, quotes from the interviewed participants will be utilized to offer a phenomenological perspective to illustrate thoughts, opinions, and impressions. Each quote will be followed by a pseudonym to credit the participant who provided the quote. A table of participant demographics and their corresponding pseudonyms can be found in Table 1.

Table 1. *Participant Demographics*

Pseudonym	Sport	Level of Competition	Class Standing	Time Since Surgery
Alex	Softball	NAIA	Sophomore	10 months
Mia	Soccer	NCAA DII	Sophomore	19 months
Abby	Basketball	NCAA DIII	Junior	16 months
Luna	Soccer	NCAA DIII	Senior	15 months
Gabby	Soccer	NCAA DIII	Junior	15 months
Natalie	Soccer	NCAA DII	Sophomore	14 months
Sophia	Soccer	NCAA DIII	Senior	17 months

#### 4.1 Nature of the Data

The seven interviews in the study resulted in a total of 695 meaning units, from which 63 total tags were identified. The number of meaning units presented by each participant varied from 77 (Mia) to 125 (Natalie). Due to the semi-structured nature of the interviews, it was likely there would be a variance in the number of meaning units presented by each participant. This variance affirms that the participants found different parts of their rehabilitation process more influential than others. For example, Gabby found social support ( $n = 33$ ) to be of utmost importance, while Mia appeared to find it impactful, but not critical ( $n = 14$ ). Additionally, it is likely that some of these participants may have been closer to home thus closer to family and had more emotional support readily available. The variance in meaning units could also have been due to participants providing more examples versus others who may have been much more concise with their answers. For instance, Luna discussed *vicarious experiences* twice as often as anyone else, while Gabby and Alex discussed a *loss of control* twice as much as the other participants. Finally, it is important to note that the quality and depth of each participant's response is not always reflected in the number of times a term was discussed. During data analysis, it was important to account for emphasis on certain words, context, and inflection throughout participant's responses.

It is also worth noting that not all topics were discussed by each participant, leading to a range in frequency of the tags ranging from 2 to 33. This variation may be representative of the significance placed on each topic to the participants. An example of this would be how the tag *informational support* was often cited by each participant ( $n=26$ ). This may be due to the importance of the athletic staff disclosing anatomical information, or it may have been a direct response to a probing question asked (i.e., what

kind of information did the athletic trainers share with you?). On the other hand, tags such as the *fear of being overbearing* and *experiencing doubt from others* were only presented by two of the seven participants (Natalie and Sophia). These differences could be due to different circumstances and relationships experienced during rehabilitation. For example, Sophia discussed how she didn't live with a roommate and therefore was alone far more than other participants interviewed and didn't put as much emphasis on relationships with friends outside of the team.

Each meaning unit was assigned a tag based on the content it presented. Appendix I provides a list of topics discussed by each participant. The 63 tags were organized inductively based on the similarity of their content into 8 properties, which are presented in Appendix J. Similar to the analysis of the tags, the properties were created from the data exhibited, and not predetermined prior to the data analysis phase.

Following triangulation, the 8 properties were then grouped into three high order categories by employing the same inductive procedure that was used in the previous levels. The three overarching categories were named *athlete characteristics and experiences*, *cost*, and *interventions and psychological resources*. The 8 properties grouped within the 3 categories are outlined in Appendix J.

#### 4.2 Athlete Characteristics and Experiences

The high-order category of *athlete characteristics and experiences* included 209 meaning units and represented 30% of the total data analyzed. This category included information about physical and psychological athlete characteristics (i.e., personal attributes, previous injuries, and other experiences that shaped their career). Overall, this

category included the properties and tags associated with *athlete make-up* and *previous injuries*.

#### 4.2.1 Athlete Make-Up

This property contained information about participant self-concept, youth sport experiences, and athletic identity, specifically relating to participants' adherence to the common sport ethic of playing through pain. This property was related, but not exclusive, to the opening question of the interview guide: briefly tell me about your athletic career prior to and now currently at your college. Responses indicated that all participants began their playing career between 4-9 years old. Mia and Luna were both 3-sport athletes while Sophia, Abby, Gabby, Natalie, and Alex only played the sport they now play in college. The following quote describes one participant's youth sport experience:

I've been playing soccer since I was 4, when we could start. And my dad coached me and then I moved to select soccer. I played on a club team called the (redacted city name) and I played there for a long time. A lot of people switch clubs, but I stayed on the same one until I was probably a freshman or sophomore in high school. I played high school soccer all 4 years and I was involved in track and cross country in high school, and then in middle school I played basketball and volleyball too. Pretty much anything I could do athletically, I would. (Mia)

Since the participants began playing sports early in life, each described how their identities were tied to the sport they played. Athletic identity and the subsequent feelings of invincibility and the sport ethic that comes with it accounted for 47 of the 126 meaning units for *athlete make-up*. The importance of athletic identity is exhibited by Natalie here, "Because I have played soccer since I was four, I don't know who I am without it, like all my relationships have been formed through soccer." Sophia felt the same way when she shared that, "I started playing soccer when I was three. It's been one of the main parts of my life since then." Other participants shared that sentiment like Alex who said, "I



definitely am a very determined athlete, so I think motivation is always here. Lifting is pretty much my passion if softball wasn't there. I love having a routine around sports. If I don't have a routine, I feel lazy and don't want to get the day started.”

The sport ethic, or the importance of striving for distinction and athletic excellence at any cost was noteworthy as well. Gabby felt especially connected to this idea of conforming to the sport ethic when she shared:

Sometimes it's like maybe I should stop or maybe I should push through it (pain). I think not knowing when to push through the pain and when to ease off was hard. In sports, you're always taught like push through the pain, keep going. (Gabby)

Athlete invincibility was also mentioned by the participants. When invincibility was discussed, participants spoke about how they had seen people get injured, but never thought that they would never have the same kind of experiences:

I always heard of it (ACL injuries) happening to other people, but I never thought it would happen to me. I feel like a lot of people would say the same thing, but it was kind of shocking and I don't really know how to deal with that emotion. (Mia)

Finally, independence was also frequently identified by participants as an important characteristic that makes them who they are. Specifically, they discussed how accepting assistance was difficult and being in a position where they couldn't do things on their own was challenging to overcome. The following quotes exhibit these struggles:

So, I couldn't drive while I was on crutches for a while so, that was also really hard. Knowing that I have my license and I can't drive...needing someone to take me to all these places like class, rehab, or wherever I wanted to go. So, it was really hard to be dependent on everyone else when I feel like I'm more of an independent person. (Natalie)

Always having to ask for help, especially being a very independent person. I hate asking for help and just not being able to do those things, you get that in your head like, I can't do anything. I'm literally worthless just sitting here not being able to do anything. (Sophia)

#### 4.2.2 Previous Injury

Participants also discussed their injury history throughout the interview. Specifically, they mentioned any prolonged rehabilitation experiences they had prior to their ACLR and this subsequent investigation and how those experiences prepared (or failed to prepare) them for their ACLR rehabilitation. Within this property, participants also mentioned the psychological impact that previous injuries had and the “emotional barriers” they experienced. For instance, Abby shared “I think injuries are more mental than physical. Like when I got hurt in high school, I started to get stressed out and started shaking and crying. I get very uneasy when something doesn’t feel natural.” Others echoed this sentiment, for instance:

I went into my club season and hurt my ankle in Florida during a game. I had to do surgery and a two-month rehabilitation the summer before going into my freshman year at (redacted school name). When I started rehab for my ankle, I thought, I don’t know if I can do this. Will I be as good as I was? And I’m sure you know that kind of thinking didn’t help. Nothing long term like the ACL. I just never thought it would happen to me. Like I thought it was a myth like oh that won’t happen to me. Which was clearly wrong. (Natalie)

This is the first really long-term injury I’ve ever had. I broke a toe in high school, but the rehab for that really wasn’t too long and I was able to bike and lift even when I was in a splint, so while I couldn’t play softball, I was still able to do a lot of the normal things I do. (Alex)

When I got to (school name redacted) for my freshman year, two weeks before I arrived, I sprained my ankle. I never had an injury before this ankle sprain, but then my junior year I kind of got back to how I was before my ankle injury. (Luna)

#### 4.3 Cost

The second high-order category, *cost*, represented 24% of the total data analyzed and 169 meaning units. While the previous category pertained to athlete characteristics and their personalities, the current category is focused on the experiences and emotions

specific to their ACL injury. Not only did some participants incur financial burdens, but they were also stripped of their ability to participate in sport, social experiences with friends and teammates, and a significant shift in daily routines. More specifically, participants revealed trepidation regarding their return to sport, feelings of isolation, loss of control over their rehabilitation process, and a challenging of their athletic identity. The words “loss”, “without”, and “individually” were used frequently throughout the interviews, brought on by probing questions from the interview guide such as: “Tell me a little bit more about the landscape of your rehabilitation.” As they related to cost and loss, this category held information concerning athletic identity, separation from team settings, and a loss of control.

#### 4.3.1 Identity Struggles

This property was concerned with participants’ feelings of having their athletic identity challenged. Specifically, participants discussed the difficulty of having their athletic identity challenged as a result of the injury, which for many, was the first significant setback they needed to overcome. While each participant’s experiences were unique, similarities describing the challenging of athletic identity arose between participants, accounting for 42 of 169 meaning units exhibited in this portion of the interview. Participants expressed how this challenge or necessary adjustment to their new role was significant as sport was a vehicle for relationship building, travelling, and socializing throughout their childhood and into the present. The following quotes detail their experiences of identity challenging:

I’ve been an athlete my whole life. When I changed clubs, it was easy to make new friends in a new environment. Without soccer when I got injured, it was really hard for me to put myself out there. I was a soccer player and without soccer I wasn’t comfortable. (Luna)

It was just like, well what am I going to do now? Who am I going to be? Just every game where the team would play, I'd be at home or on the bench not dressed in game day stuff. And then now I was going to have to spend my days recovering from this and going through the surgery process and not even being able to walk. I think it was...just like who am I? What am I going to do now? I didn't think I'd ever have to go through that. (Natalie)

While identity struggles and the perceived challenge of athletic identity was significant, the questioning of their self-concept without sport was also a prominent theme within the responses. For instance, participants described how they perceived this and what they did to manage the pervasive thoughts about “not being an athlete”:

I figured out that with soccer, soccer isn't everything and I'm going to be done with soccer in three years and who I am is going to take me through the rest of my life, not how good I am at soccer. So, realizing that soccer...obviously I want to be good, and I want to be successful at it and I'm going to work hard at it, but it's not everything and it's not who I am and if I had a bad day or a bad practice or something that doesn't define me. (Mia)

I think I would have just had a hard time because when I was going through the whole rehab process it was hard for me. Just figuring out who I was without it (soccer) and how to form relationships not around soccer and what to do with my free time because I had a lot of it. It was just really hard for me to figure that out. (Natalie)

Notably, one athlete (Luna) decided that her identity would need to transition from being an athlete into another role within her team. As an experienced, and often relied upon player, she felt a responsibility to offer her expertise in a different manner for the team:

I'm on the team but I decided that I'm not actually going to play just because I can't do that for a second time. But it motivated me more to feel like a leader, I guess. I eventually became a captain my junior year, so I feel like my motivation...I tried to motivate people a lot more on the sidelines.

Trepidation about return to play and fear associated with the diagnosis were also common themes among participants. In the above quote, Luna discusses how her role

within the team changed. Here, Abby discusses her hesitation about returning to sport by saying, “I was confident I’d play again, but I was scared to go back. I’ve made it through small injuries, but nothing like this.” Others described a sense of fear in their return to play:

I mean I was horrified to go back to play after my ACL injury. Just because I didn’t want it to happen again. I had a knee brace to wear which made me feel a lot more confident regardless of if it happens again or not. I was timid when I first got back and eased my way into it. I did non-contact my whole sophomore season and then eased my way into contact. But I don’t really have any desire to do contact stuff. A part of me wants to be able to play on my senior night and stuff, but probably not for very long. I don’t even want the possibility of me doing that again. (Luna)

Fear of the injury diagnosis was a consistent theme among participants. While some of the participants had an idea of what happened and were able to prepare themselves for what the medical staff might say, some were worried about the potential absence from play:

My [athletic] trainer came out. I was in tears because I was scared and I knew exactly what happened. I knew I was going to be out for at least nine months. The [athletic] trainer came out and he said, “oh, well we have to do some tests” the ACL tests and stuff like that. I said OK, you can do whatever test you want but I know I tore my ACL and he said, “well let’s stay positive.” Then he did the tests and stuff, and he said, “well we don’t know for sure, you’re gonna have to get an MRI done”...tore my ACL. (Sophia)

When I was on the ground, I was mainly thinking I tore my ACL. That’s the injury you hear about all the time, so you worry about it the most. Initially, I was very concerned about that. When I got into the training room [athletic training facility], I couldn’t walk very well. I was limping and people were helping me. I just had a lot of inflammation, so it was hard to tell what was going on and diagnose anything. That’s also the most frustrating part. You have so much time to wait in between X-rays, MRIs, and surgery. I think the waiting part was the most frustrating because I felt like I knew it was an ACL, but you just don’t have that confirmation and you don’t want it to be an ACL kind of thing. (Gabby)

When discussing a fear regarding injury diagnosis and their return to play, participants discussed how they would do the exercises they needed to do during

rehabilitation and take the necessary precautions during treatment, but full confidence in their knee was hard to achieve. Even after the medical staff would offer reassurance, participants expressed how, in their opinions, ACL rehabilitation was more mental than physical in some ways, and that the approach to rehabilitation should encompass both:

I've heard stories about people coming back too soon and they do it again in their first practice. I just wanted to be 100% positive because it's also a lot of...I didn't really ever have this issue that much, but I know a couple other people did, like coming back and being scared to go into a tackle or scared to do anything. I personally didn't have that too much, but that was also kind of worrisome for me. (Natalie)

That's my biggest thing...the whole injury was mental. Like physically I could do it. I could do what I had to do, it was just like, "why do I want to do it?" "Why should I do it?" It was all mental. (Gabby)

#### 4.3.2 Limiting Separation

This property accounted for information about how separation and isolation impacted injured athletes. Specifically, these participants mentioned how separation or distance from their teammates, family, and/or friends complicated their rehabilitation process. As one participant put it, "I just needed to know I wasn't alone in my emotions or, you know, physically, like in the training room [athletic training facility], it was better when other people were around" (Mia). Other participants discussed limited opportunities to see family and friends from home, due to distance. Coupled with rehabilitation session time and team practices conflicting, participants experienced distance between themselves and the rest of the team:

I didn't feel like I was close to the team. I didn't get to play with them. I didn't get the same interactions as the rest of the girls got. A lot of teams or athletes will go in and do rehab while the rest of the team is practicing. This creates separation. The way our gym is set up, you can see into the gym and watch practice if you're in the training room [athletic training facility], but it wasn't the same as being on the court. (Abby)

I just needed to be around people that cared about me. I needed to be around people who actually asked how I was doing and not just like “Oh how are you?” and you just respond with “good”. Being around other people really helped me a lot. (Mia)

Participants also mentioned the feelings that came with missing practices and games. A feeling of missing out on the opportunity to make memories was consistent throughout the interviews as well. One participant discussed the difficulty of watching practice while doing treatment:

When you’re watching your team play and you can’t be out there and help them, it breaks your heart. When you’re on the sidelines all the time...I had to try and figure out how to be a part of the team with being on the sidelines and how to deal with that separation. (Mia)

I wanted to go in so badly to help my team because they...it destroyed me just watching them play and not being able to be out there and contribute. I hadn’t been cleared by the doctor yet, but my appointment to be cleared was the next day so I knew I was fine. Sitting there not being able to help was one of the most gut-wrenching feelings and it fueled me to go into contact practice to get into a position where I could help my team. (Mia)

The remaining participants shared the difficulties of missing such events. In particular, Luna disclosed “The fact that I was missing out on everything and I’m really close to my whole team...so that was just like missing out on more stuff with my best friends I guess you could say.” Another participant responded similarly:

I think the separation was really hard and frustrating because so much stuff happens at practice. It feels like you are separated from your team. I think that was really hard. It was also frustrating because so much work goes into rehab that I would go to rehab before practice sometimes and still be there whenever they were getting out. I’d go two hours on some occasions and be there longer than the team. It was frustrating because you feel like you are missing so much. (Gabby)

Coupled with the struggle of missing events, participants mentioned the struggle of general isolation, both from being forced to attend rehab during practice, or by being generally excluded from team functions and travel. Gabby mentions, “It was frustrating

because you feel like you are missing so much, but you also have so much work to do and you think to yourself, ‘when can I get back to that?’” Other participants shared similar sentiments:

I think it (not being alone) was really huge for me, and I think positive for my mental health. I would have probably been really sad and bored if I was locked up in a dorm room or whatever with no one to help me out and yeah...the world on shut down having nothing to do. It was really awesome. I got to get closer with my brother and sisters so all-in-all, it was the best thing for me, I think. (Alex)

#### 4.3.3 Loss of Control

This property accounts for information about the participants perceived lack of ability to make decisions for themselves and ability to do things as they normally would (e.g., walking, carrying food, driving). Loss of control for these participants equated to a relinquishing of their independence, which was another salient theme. Being in a position where these participants were initially dependent on outside resources was challenging in regard to feeling restrained by athletic trainers, the perceived loss of normalcy in their day-to-day lives, and the subsequent adjustment to this new normal.

The following quotes represent participants’ experiences in feeling restrained by athletic trainers when they felt as though they were ready to progress. This feeling of restraint was frequently mentioned by the participants:

I don’t want to push myself somewhere that I might get hurt again. Like somewhere further than I can go or further than the AT knows I can. I respected it, but it just holds you back as an athlete, because you want to do so much more. You feel like you haven’t done anything for so long. You just get antsy. You are ready to get back out there. You feel very restricted mentally. (Abby)

There would be those days where I felt like I could do something and them (AT) saying no, your knee is not ready yet. I would get so upset. I’d say, “what do you mean? I feel perfectly fine! I did everything you told me to. Why can’t I take the extra step?” Then them saying, “Well this is the point where your knee kind of goes through a downhill phase where you have to be extra cautious.” Or they’d



say something along the lines of, “I know everything feels fine but it’s not...it’s like...” Oh that’s so frustrating. (Sophia)

I think physically, I feel like I could do more, but my [athletic] trainer wouldn’t let me. They wanted to take it slow and not rush it, which I understand, but mentally, that bugged me. I was mentally feeling like I was held back and couldn’t do what I felt capable of. I would do stuff outside of PT and feel fine. But my therapist would say, “No. Let’s hold back.” (Abby)

The loss of normalcy was also discussed frequently. The sudden shift from independence to “worthlessness” as Sophia described it was challenging and uncomfortable for several of the participants:

It was hard not being able to walk or do things that I was used to. I’m pretty good at lifting and working out so that was really mentally hard. I couldn’t do anything that I was used to being able to do. I couldn’t run, I couldn’t squat. It was hard. (Alex)

I think like feeling like you didn’t have control over the situation especially when it’s your own body. I think for me when that was happening it was frustrating. You could go ice or ice bath or get in the Normatec and feel a little better the next day, but you never knew when you would actually feel better. You could do things without thinking about your knee. (Gabby)

Adjusting to a “new normal” was occasionally mentioned as an uncomfortable but necessary experience. Enduring the injury, the surgery, and subsequent rehabilitation is an extensive process that will require adaptations to everyday life. Understanding that although these participants were doing everything necessary for their recovery but not seeing results instantly was very challenging to get accustomed to:

And then sometimes for my ACL I kind of struggled getting my range of motion back so that was kind of...that (expletive) sucked because I did all of my exercises at home. Especially at the beginning because I’ve had friends do it (tear ACL) before, so I thought, “This is important. I need to do this stuff.” And then sometimes it (knee) would make progress and I’d think, “well I don’t...I’m trying...” But it was just really frustrating how I’d do everything I was supposed to do and not make progress. (Luna)

I mean what we see as normal now was hard at first, but it just gets easier as time goes on. I think the injury presented a new challenge and something that I can work towards and get better at. (Abby)

It was hard for me to grasp that you have to ease back into things. So that's a lot of what went into it. It's also partly not realizing how much your knee is going through on a daily basis, like walking to class would be a lot on my knee at the time. For me, that felt normal, but at the time it was a lot of pressure on my knee. Same thing with doing small things, like moving a chair or tables. If you're doing that for two hours, that's a lot on your knee and you don't even realize it. It was small things and over excitement to be able to do it again. (Gabby)

#### 4.4 Interventions and Psychological Resources

The final high-order category of *interventions and psychological resources* included 317 meaning units and represented 46% of the total data. This category pertained to the information about coping mechanisms that these participants used, motivational tactics, along with other psychological constructs influencing athlete rehabilitation. Overall, this category revealed a particular emphasis on the importance of social support, be it tangible, emotional, and/or informational.

##### 4.4.1 Vicarious Experiences

This property discussed participant motivation that contributed to their rehabilitation in a positive way. More specifically, participants discussed the impact of vicarious learning, such as observing someone successfully complete their rehabilitation and return to play was encouraging. Additionally, participants emphasized the value in having models or previously injured athletes to emulate their rehabilitation after.

Seeing other athletes perform rehabilitation exercises simultaneously and subsequently return to play was positively viewed by several of the participants. The participants' experiences are as follows:

In my head I would think, “Okay, she’s a week ahead of me but I want to get to where she’s at so…” And that’s just the competitive nature in me like, “Okay well if she can do that and she’s a week ahead of me let’s see if I can catch up and be on the same level.” (Sophia)

There was a girl in there that had torn her ACL and she was coming back so it was really good for me to see her and like her progress and how well she was going and when she got released in just knowing that there’s a hope in that I’m going to be there one day. (Mia)

My physical therapist would always say, “You can go up 10 more points, up like 10 more!” And that was always a joke we would play. So, I would try to beat the other patients that had gone and gotten high numbers on this machine. And just seeing other people in the rehab facility just smiling like it helped a lot. (Mia)

Identifying someone to emulate their rehabilitation process after was also a noteworthy theme amongst these participants. While some participants had friends or teammates who had previously sustained a similar injury, some were very creative in the ways in which they found rehabilitation role models:

I think there would be times I would go online and there are people on YouTube where they’ll document their ACL journey. I would watch those to see what is ahead and what to look forward to and stuff like that. Looking it up online to see what is going to happen and to have a timeline. You can see how other people dealt with it and what they went through. I think giving myself someone to compare to was very helpful. (Abby)

I think the amount of time I was going to be out was tough. When I went into the training room [athletic training facility] right at the beginning, I asked how long it would take. They said at least a year. Then I went on the Internet and found people who came back in six months and stuff like that. So, I told myself then that I was not taking a year to get back. (Abby)

If I had any questions like, “When did you get your full range of motion back?” “Did this ever happen to you? Did you ever get cramps” Just stuff like that and just understanding the rehab process from someone who had been there and done it before. Like how long it takes and everything like that. It was good to find people who had it happen to them before. (Luna)

#### 4.4.2 Social Support

This property involved responses about informational, emotional, and tangible support from friends, family, teammates, coaches, and the medical staff. This property alone accounted for 161 of the 695 total meaning units. This significant percentage could be due to its overall importance to the rehabilitation process or the participants' willingness to offer several examples of each type of support. While the various types of support contributed to a large portion of the meaning units, thoughts on being held accountable throughout the rehabilitation process and the relationship and communication between athlete and athletic trainer/physical therapist received considerable attention as well.

A quality relationship and open line of communication between participant and athletic trainer was a salient theme throughout the interviews. Participants mentioned how the athletic trainers were good people, personable, and offered the level of relatedness they needed to feel comfortable during treatment. The following quotes represent the participants' experiences with their athletic trainers:

So, the college [athletic] trainer, there is two of them but they're for the whole athletic department. Both of them were extremely personable. We all had a really close relationship, and they were very helpful. (Natalie)

I think I have a good relationship with all of them [athletic trainers]. I know since there are only three athletic trainers and our campus is so small and athletes make up a majority of our campus, the relationship between the athletic trainers and athletes is really good. Then if you have a very good relationship with one of the [athletic] trainers, you're most likely going to have a good relationship with all of them. So, it was comforting going in. Working with them and kind of just talking with them and going through the process with them. (Sophia)

I became best friends with all of our athletic trainers, so it didn't really matter to me who I went to see. I would just schedule appointments online and go, regardless of who was in the training room [athletic training facility] that day. (Luna)

Athletic trainers also served as a source of support for the participants.

Participants mentioned good communication, tangible help, and a cohesiveness among the athletic training staff so there were never times where the participants felt like information was getting lost or needed to be repeated:

At (redacted school name), we have three athletic trainers for the athletic department. We'll have a different [athletic] trainer pretty much every day at practice. They were all on the same page throughout my rehab though and really good about communication and what the next steps were and everything. (Abby)

It (relationship with athletic trainers) was good because they talked a lot. They were really close since the rehab facility was connected through the school. The school would refer everyone to that facility. So, it was easy. They both knew what each other was going, so it was pretty easy. There was nothing hard about it, really. (Natalie)

Being held accountable by family, friends, and members of the athletic training staff was also frequently mentioned by the participants:

The fact that (redacted athletic trainer name) would be there. She'll let me know if I am screwing up or am slacking, so that's the good relationship we talked about earlier. I know when she'll call me out, so just like having someone to hold me accountable. (Alex)

My biggest contributors would probably be my parents just pushing me and when I didn't want to wake up at 5:30 and I was feeling discouraged, my dad would say, "You need to go." Even if I didn't want to hear it, they would tell me and that is something that I really needed in the moment. I didn't want to hear it but looking back I'm glad they pushed me and they're holding me to a higher standard and not letting me slack off, which is easy to do when you're feeling like it's taking so long. (Mia)

While social support as a collective category was discussed in detail, participants highlighted the importance of receiving different types of social support. Specifically, participants mentioned the utility coming from each type of support. Informational, tangible, and emotional support were all extensively discussed in the interviews, especially the value and the source of each type of support.

Informational support, or the offer of advice or assistance in problem solving was also highlighted by each of the athletes on several occasions. This type of support was often discussed when the participants explained their positive relationships with the athletic trainers and the rest of the medical staff:

Being able to go back to (redacted school name) in person was good so that I could be with my [athletic] trainer so she could watch to see if my knee was moving out and to make sure my mechanics were working. It is hard because you don't have the personal experience and you can't see the small details that need to be fixed when it's just online or someone sending you workouts. That was good to get specifics of my mechanics back to normal and helping me get my confidence back with running. (Gabby)

The [athletic] trainers were very good about if I had any questions, they were very good about answering them. Then they would compare with past athletes they've been with. So, being able to get a firsthand account of what other people have been through, that was really helpful to know. (Abby)

She [athletic trainer] told me we needed to start out with strengthening up my leg again. Well, my left quad atrophied really bad. I have really big quads, so it looked like a whole new leg, so she told me about how we'd get it back to looking like my other one. We did a lot of hamstring strengthening and quad strengthening because she told me sometimes hamstrings get neglected. We did a lot of like leg raises going through all the planes. We did that for a really long time. (Alex)

I had my senior seminar class, and I wrote it on the efficacy of functional knee braces, so I can talk all about that stuff because my doctor said that I needed to wear one at least like the season back from my injury and then my PT was like, "You're not wearing a knee brace. If you feel the need to wear a brace, then you shouldn't be on the field yet. (Luna)

Tangible support involves the direct or concrete ways in which these participants required assistance throughout their rehabilitation process. Similar to informational support, tangible support was often mentioned throughout the interview process:

My parents took care of me, so they were with me all the time. So, they were with me during the really bad days, and they knew how bad it was for me so they were just supporting me throughout that entire thing. Then also my friends and I'd moved back into the dorm and stuff. They were always there for me helping me and making sure I had everything I needed. (Luna)

I'm not a (redacted city name) resident, so I had no idea about doctors or anything, so having the [athletic] trainers to drive me to appointments when I couldn't drive and point me in the directions, I needed to go was really good. (Sophia)

Even with (redacted security company name), our security on campus. I built a really good relationship with them. Just having them to pick me up every morning and drive me to academic side so I wouldn't have to crutch all the way to campus. Building those kinds of relationships was really positive. (Sophia)

Emotional support and verbal persuasion were also frequently mentioned throughout the interviews. Multiple examples were shared and the various sources with which these participants received this kind of support were shared as well:

We ended up creating a group chat for all of us (injured players). We still talk pretty frequently because of the bond we made through injury. We're also all on the same team, so that's nice as well. It was also nice because it created a very warm environment in terms of being in the training room [athletic training facility] and rehabbing. I think we all got together really well, and it was nice to be able to bond more over doing everyday rehab stuff. (Gabby)

Also, my friends were super encouraging even though they didn't necessarily know exactly how I was feeling on the sidelines during games when I couldn't play. I couldn't play or be a part of those big wins and that was super hard. So, having one of my best friends now, she was in the stands with me. She wasn't on the team, but we got really close over those couple of months. So, that just kept me more positive because it's easy to just get in this like depression state of just...I don't know just sad. But she made it just more fun to be in the stands because there were times where it just sucked but having her to laugh with and just talk to helped me through a lot. (Mia)

Well, I had a really good support system. My family was really supportive. I found out who my real friends were kind of through it, so that was really helpful too, so they helped me out a lot. Personally, I didn't know how to deal with it without them. It was basically through my friends and family that I got the motivation and support. (Natalie)

Team athletic trainers and physical therapists were also seen as a source of emotional support for the participants:

Just talking, mainly with my physical therapist. Then I take the messages from my physical therapist which were frustrating sometimes and the share them with the

athletic trainer and having them say something like, “I know this is how you feel, but you’re going to get there, you’re going to be able to do this soon. Just keep doing what you can now and perfect what you can and then that will just make the next step up easier.” (Sophia)

I just feel like I have a lot of inspiring people and motivating people in my life. So, several of my friends had also gone through this injury and were by my side throughout that entire time kind of acting as mentors because they had been here before. They were with me for the whole process telling me stuff like, “It’s okay, you’ll get better. I’ve done it and so can you.” (Luna)

Emotional support from the team’s coaching staff was of particular note for some of the participants when discussing the encouragement they received:

So, when I was having a bad day, that was recognizable, and they would try to cheer me up. And that goes for my coach, too. He would often check in on me just to make sure I was doing ok. He would always ask me how it was going and how I was. That’s important regardless of how I was doing. Just knowing that someone wants me to get better, that motivated me more. (Luna)

On a positive note, it was my family, friends, and even my coach. Him (coach) texting me like, “Okay, when your injury happened, that was such a big loss for our team.” Hearing him want me back on the field to help out my team...I’d think, okay! I’ll get there! I want to be there! I want to support my team and I want to be a factor on the field. I want to play for the group around me. (Sophia)

#### 4.4.3 Psychological Resources

This property described mental skills, coping mechanisms, mental health professionals, and sport psychology professionals that these participants discussed. Additionally, the relational approach taken toward these participants throughout their injury was addressed. Finally, several of the participants addressed growth that they experienced during this extensive absence from sport. The growth was categorized as both psychological and physical.

Coping mechanisms and psychological skills ranging from journaling to goal setting to self-talk were employed by these participants. Although a majority of the techniques used were quite consistent between participants, some were quite unique:



Journaling is a big thing for me. That's how I cope with things is just getting it out on paper. Writing some of those emotions or even taking a video of myself just talking. I know it sounds funny but just saying and releasing all that because if you don't want to tell people everything it's nice to be able to journal or just make a video. (Mia)

I think keeping your goals in mind are very important. Having those written somewhere or somewhere you can remind yourself why you're doing all of it. It's a very long process. I think the goals are really helpful. (Abby)

I think the goal setting. Everyone goes through bad days whether you're hurt and out of playing or when you're completely healthy, you're going to have bad days. I think my main push was, "well if you don't go, if you don't get out of bed, if you don't start somewhere, you're not going to get to that end process." (Sophia)

We would do the stair master a lot and I hate the stair master. So, even though I hated it, I would be like, "I'm going to kill this workout. I am not going to let the stair master ruin my day." (Alex)

While most participants utilized these psychological skills as a motivational effort, Luna created goals for herself that were more avoidant than mastery based. Luna perceived the fear of the goal not being completed as a threat or a challenge. She would set goals and keep them private for fear of not being able to meet the goal she set for herself: "Yeah, like me and my PT would kind of set goals, like my range of motion and that was good. Or I would like just make them up in my head and not really say them out loud in case they weren't like going to be met." (Luna)

The importance of mental preparation was also mentioned during the interviews. Luna discussed how the injury, surgery, rehabilitation, and return to play wouldn't be a linear process, so the need to prepare was important: "I think the whole first few days were like a mental block. There is such a need to prepare for the whole process so you don't go in blind." (Luna)

Mental health resources like psychologists and sport psychologists were discussed throughout the interviews as well. While access to this kind of resource was limited,

some participants were able to utilize various types of mental health practitioners throughout their recovery:

I always talked about going to see a therapist about it (the injury). We had a sports psychologist who is actually a grad student at (redacted school name). I forgot who she was, but I always talked about maybe wanting to see her, or see a sport specific psychologist. I never got myself to do it, but I probably should have. (Luna)

My mom made me actually go to a psychologist about it (injury). I think that's also important. I was stubborn and didn't want to go but looking back I think that would also be good (for recovery). A good resource for it. (Natalie)

When discussing mental health professionals, Natalie also brought up the fit of the psychologist and the athlete:

I only went once because it wasn't the right fit for me. I never went to go find another one because I didn't want to go through the process of telling my story again because like I said, every time I talked about it, I cried because I didn't know how to express how I felt. But having a sport psychologist...because I didn't go to a sport psychologist, it was just a psychologist, so she didn't know anything about sports or ACL injuries or anything. It would have been more helpful if she knew about sports. (Natalie)

An emphasis was placed on the value of a holistic or human-first approach when people were interacting with these participants during their recovery process. Discussions revolved around people really showing that they cared for the participants and taking a genuine interest in their well-being:

I think just like having a strong connection with your doctor or physical therapist to say, "Hey, can I call my parents and put them on the phone so you can talk to them?" Or just reaching out or giving them my parents number or email was super beneficial. Knowing that the doctors and [athletic] trainers would take the time to make sure I was comfortable, and my family was comfortable was super...I mean heartwarming almost. (Sophia)

Having people around you that are going to be asking about you as a person. I think that plays a huge role. You need to be surrounding yourself with positive people that are not only concerned with like themselves, but say, "How are you doing? How are you feeling?" And it's easy to say, "oh, good." But people that are actually around you and invested in your relationships are so important. (Mia)

For sure having one [athletic] trainer who knows you and you know them. And then working with that [athletic] trainer to build a relationship where they'll ice you down if you need it but also knows when you aren't feeling it and knows how to work with you on those bad days. (Alex)

Stress-related growth and value coming from the extensive rehabilitation experience was also a salient theme amongst these participants. While there was never a participant who was satisfied that this happened to them, a stark majority of the participants were able to recognize growth that came from an otherwise trying situation:

I'm not saying that I'm glad this happened, but it did make me a stronger person and it did make me better because I think that I took soccer for granted a little bit. I thought I could never get hurt and never have it taken away from me, so I just learned to be more here and now. (Natalie)

As much physical as it was...I don't know...it was more mental getting through those days and it just made me mentally stronger not just physically stronger. That was good because I know that I can push myself so much more than I thought I could. I know that my body has more potential than I ever thought. (Mia)

I would wake up each day...well most days...knowing that I could come back bigger, better, and stronger, and that this wasn't anything more than a speed bump. (Sophia)

#### 4.5 Summary

The purpose of the current study was to investigate what factors related to motivation and self-efficacy contributed to a successful rehabilitation from ACLR in a sample of NAIA and NCAA Division II and III female student-athletes. Each participant provided considerable insight into their experiences with injury, histories in sport, and the tools they used to complete their rehabilitation process and return to play successfully. Seven female NAIA and NCAA Division II and III athletes were interviewed, and an inductive analysis of the data revealed three high-order categories, which were labeled

*athlete characteristics and experiences, cost, and psychological resources and interventions.*

*Athlete characteristics and experiences* contained information about physical and psychological characteristics of these athletes with a focus on their time before becoming a college athlete. Additionally, personal attributes, success in youth sport, and previous injuries prior to their ACL injury were discussed. While most of the participants were one-sport athletes, two were multi-sport athletes, and one played two sports in college. Specifically, four were soccer players, one was a basketball player, one was a softball player, and one played soccer and ran track. There was consistency between participants regarding introduction to sport, the age these participants began playing sport, and the way these participants described themselves. There were many conversations about strong athlete identity. Additionally, in regard to previous injury, each participant mentioned the psychological impact associated with injury, the fear associated with the potential of reinjury, and the idea that physical readiness and psychological readiness to return to sport were not synonymous.

*Cost* explained information about participants losing “normalcy” in their lives, the challenging of their athletic identities and what these participants recognized as their purpose, as well as a loss of experiences and perceived control over their lives. Within the conversations regarding athletic identities, the participants discussed a questioning of their identity without sport. Additionally, they discussed how not being able to play their sport equated to not being an athlete. Conversations around trepidation about returning to play were also salient. Due to the extensive nature of ACLR rehabilitation, there was a common theme that doing this rehabilitation again was not possible if they wanted to

continue playing their sports. Limiting separation was also a salient theme amongst these participants. Each participant discussed the impact that being away from the team due to rehabilitation appointments, missing practices and games, and the importance of not being alone had. The loss of opportunities to make memories with friends was a particularly notable aspect of this discussion. Finally, a loss of control was reported by a majority of the participants. During rehabilitation, these participants felt as though there was the necessity to adjust to a new normal and that adjustment was very uncomfortable. Additionally, participants felt like their rehabilitation was out of their hands and they had to rely on others as well as themselves. Independence was a considerable piece of the *athlete characteristics and experiences* category and having to relinquish that independence was very challenging.

*Interventions and psychological resources* was the final high-order category. This category was comprised of information regarding coping mechanisms that participants were using, any social support that was present, and any other psychological factors that influenced rehabilitation. This high-order category represented 46% of the overall data collected from the interviews. Vicarious experiences were discussed with an emphasis placed on seeing others doing rehabilitation simultaneously, finding rehabilitation models, having friends who have had the same injury, and the positive impact that seeing another athlete progress had. Social support was also discussed and while good communication with the medical staff received considerable attention, informational, emotional, and tangible support were the focus of the conversation in this category. Stress-related growth was discussed, as participants mentioned how while the injury was debilitating and psychologically challenging to overcome, there was a commonality in

how participants felt like this happening was a positive for the long-run. Finally, psychological resources were more concerned with the individual participants and their methods of facilitating a successful rehabilitation. Mental skills like journaling, self-talk, and visualization were employed and the benefit of having a mental health professional was also discussed. Each participant also put an emphasis on a holistic approach from others during rehabilitation. The human-first approach from family, friends, staff, and most importantly, team coaches received notable attention throughout each interview.

## CHAPTER 5. DISCUSSION

The purpose of the current study was to better understand the tenets of self-efficacy as they relate to motivation and rehabilitation adherence in female NAIA and NCAA Division II and Division III athletes post-ACLR. Three high-order categories emerged from the data: *athlete characteristics and experiences*, *cost*, and *interventions and psychological resources*. This chapter will discuss these categories as they pertain to the extant literature regarding recovery from significant injuries and the implementation of psychological resources and interventions during rehabilitation.

### 5.1 Athlete Characteristics and Experiences

The high-order category labeled *athlete characteristics and experiences* pertained to physical and psychological athlete characteristics, personal attributes, and previous experiences as an athlete, including previous injuries. This section will begin by explaining the different experiences that shaped these participants' athletic careers. Although each participant experienced a different path to get to collegiate athletics and had differing characteristics and experiences, many common themes emerged. These themes will be discussed as they relate to extant literature on collegiate athletes.

Previous researchers examining the influence of athletic identity on athletic success have determined that athletes model their identities through both positive and negative sporting experiences (Black & Smith, 2007; Gustafsson et al., 2008). Similarly, findings from the present study suggested that the combination of positive experiences (i.e., winning, making friends, travelling) and negative experiences (i.e., losses, injury, losing a spot on a team) contributed to the development of that participants' identities within their athletic career. The term "athletic identity" has been defined as "the degree to

which an individual identifies with the athletic role” (Brewer et al., 1993, p. 237), where a strong athletic identity has been shown to direct motivation and energy to engage in athletic roles, potentially leading to athletic success (Martin & Horn, 2013). Current participants began competing in sports, both recreational and competitive, as early as four years of age and credited this period as a contributor to their athletic-centered self-concept and strong athletic identity. There appears to be a direct connection between time commitment and athletic identity, suggesting that the more time an individual commits to their sport, the closer they will identify with their athletic identity (Lally & Kerr, 2005). Current participants further revealed how their long-standing participation in sport enhanced their ability to socialize with diverse people and have experiences they would not have otherwise had. Between the sacrifice of activities outside of sport and the positive relationships made through sport, the participants from the current study were able to establish relatedness with like-minded peers. Findings from this investigation demonstrated ways in which experiences of achievement, and relatedness fostered perceptions of success in sport, regardless of the level of competition.

In addition, consistent themes throughout the study included conformity to the sport ethic (i.e., “a set of norms accepted as the dominant criteria for defining what it means, in their social worlds, to be defined and accepted as an athlete in power and performance sports”) (Coakley & Donnelly, 2009, p. 155) and independence associated with being an athlete. Conforming to the sport ethic orients itself well with the possession of a strong athletic identity because the idea of making sacrifices to be considered a true competitive athlete is shared between the two concepts. Hughes and Coakley (1991) suggested four pillars which encapsulate the essence of the sport ethic. These four pillars,



which were also shared, in varying detail, by participants of the current study, state that being an athlete involves (1) making sacrifices for the game, (2) striving for distinction, (3) accepting risks and playing through pain and, (4) refusing to accept limits in the pursuit of possibilities. The fact that most participants in this study discussed a conformity to the sport ethic may reflect a combination of factors including the style of coaching they received as youth athletes or type of athletes they admired as they became more invested in sport. Data collected on the concept of the sport ethic exemplifies how conformity to that ideal is pertinent in many sports and at many levels of competition (Coker-Cranney et al., 2018). Specifically, this research demonstrated that regardless of the level of competition, conformity or over-conformity is prevalent and will influence an athlete's perception of what it takes to be an athlete. Although an athletes' commitment to sport is seen positively, the subsequent adherence to the sport ethic and commitment at all costs mentality can lead to overuse injuries and under-recovery from injuries. While the athletes in the present study are not competing in the preeminent college athletic division, their conformity to the sport ethic affected their response to injury by attempting to play before medical clearance or rehabilitate through the pain or try to get back to play quicker than originally planned. The conformity to the sport ethic also holds true for youth sport. Specifically, Budziszewski (2019) showed how while the sport ethic isn't explicitly described at the youth sport level, data provided evidence that promotes the ideals of this belief system. With less frequent attention from athletic trainers and therapists at this level, practitioners should be attuned to this behavior as it may be detrimental to rehabilitation outcomes, such as seeking help from others.

Although athletes in the present study mentioned previous injuries, the physical and emotional discomfort that accompanied their ACLR rehabilitation was amplified compared to prior injury experiences. Of the participants, four reported significant injuries that had previously kept them out of sport. Two participants cited an ankle injury and subsequent surgery, one mentioned a broken toe, and one discussed a medial collateral ligament sprain in the opposite knee. Although most minor physical injuries resolve with treatment and rest (Maffuli et al., 2009), participants reported trepidation about returning to play following their previous injury, as well as anxiety about potential reinjury. These two sentiments are consistent with Podlog and Eklund's (2004; 2005; 2010) and Podlog, Banham, Wadey, and Hannon's (2015) findings regarding return to sport following injury. Taken together, these studies described how confidence in returning to sport, having realistic expectations about sport capabilities, and appropriate motivation to regain previous performance standards are all critically important prior to returning to sport at any level. While the NAIA and NCAA put an emphasis on other aspects of the college experience besides sport in all Division levels, the cultivation of confidence, maintaining motivation, and setting appropriate goals are all critical for NAIA and NCAA Division II and III athletes recovering from injury and should be addressed throughout the entire rehabilitation process. By using successful injury rehabilitation as an advantage, practitioners can encourage athletes who are injured to recall previous accomplishments of rehabilitation, previous successes in returning to play from other injuries, and other successful relationships with sport medicine professionals, for example.

Current participants' discussion of confidence in their return was crucial, otherwise hesitation and apprehension could lead to potential reinjury, thus emphasizing the importance of one's psychological readiness to return to play. Participants discussed how their previous injuries were expected due to their involvement in sport, also addressing how, because these injuries were more short-term, it was easier to recover emotionally and physically. Consistent with Edouard and colleagues' (2020) research on returning to sport and the necessary adjustments needed to continue participation following rehabilitation, while a successful return to sport was achieved, two of the participants were required to reduce their training load significantly. Both participants who were required to alter their training regimens attributed a heavy training load to be an antecedent to their ACLR. Therefore, the importance of psychological readiness coupled with an understanding of personal physical capability when returning to sport post-injury is no different for NAIA and NCAA DII and DIII student-athletes. Particularly for student-athletes who often share resources, such as sports medicine personnel and athletic facilities, it is especially important for practitioners who have frequent contact with these rehabilitating athletes to support the athlete's physical and psychological well-being through the various types of social support and any readily available rehabilitation resources.

In summary, this category highlighted the athlete make-up and previous injury experience of the participants, specifically in their youth sport careers. While the experiences varied, several common themes emerged. In particular, participants held a strong athletic identity and mentioned a conformity to the sport ethic as outlined by Coakley and Donnelly (2009) and Podlog and Eklund (2010). Given the sport

differences, number of sports played, and length of time competing in these sports, it is reasonable to argue that the development of each participant would be different; however, this was not the case. Participants attributed a lot of the friends they've made, places they've travelled to, and experiences they've had as direct results of competing in various sports, especially the sport or two they compete in exclusively. Participants revealed the importance of being seen as an athlete, the independence that contributed to that athletic identity, and discussed the importance of being considered an athlete. Finally, injuries during the participants' youth sport careers were discussed as well. Trepidation about return to play and anxiety about reinjury were salient themes that aligned with previous research (Podlog and Eklund, 2010). However, many of the resources that participants had access to in Podlog and Eklund's research was unavailable to the participants in the current study, yet they were still expected to successfully recover. In sum, although different backgrounds were represented, youth sport experiences and personal make-ups possessed common themes among participants which prepared them for sport and assisted them in feeling grateful for the resources they did have available in their college setting.

## 5.2 Cost

The second high-order category *cost* pertained to the participants' sentiments of losing normalcy in their lives. Additionally, the challenging of their athletic identity and what the participants recognized as their purpose, as well as a loss of experiences and perceived control over their lives was discussed. This category contained information consistent with previous findings on athlete experiences following a significant injury.

Sport-related injury can be a traumatic experience which can generate emotional and psychological responses, such as depression (Tracey, 2003), stress and anxiety (Clement et al., 2013), anger (Udry et al., 1997), shock (Johnston & Carroll, 1998), and frustration (Vergeer, 2006). The findings from the present study relate to the previous research, as participants in this study reported feelings of depression and anxiety, due to not being able to fulfill expectations of who they believe they are supposed to be as an athlete during their absence. These negative psychological responses from the current study as well as those in previous research appear to be related to perceptions of loss (e.g., social experiences, playing time, scholarship status) (McDonald & Hardy, 1990; Von Rosen et al., 2018). Athletes use sport as a method of managing stress, feeling a sense of belonging, and as a method of demonstrating competence (Warner & Dixon, 2011). Despite the participants' team membership, their absence from practices and games precipitated a feeling of not being a part of the team and thus, feeling like less of an athlete. This was especially pertinent for the participants in the current study because the coaching staff and resources are already stretched so thin at the NAIA and NCAA Division II and III levels that most of the attention was placed on those participating. The perception of not being a part of the team was damaging and demotivated rehabilitating athletes at times, which was reported to significantly impact the overall rehabilitation experience. Podlog and Eklund (2004) echo this in their research when explaining how injury and absence from the sporting environment brings on feelings of fearfulness that without competition, athletes may lose membership in the "elite athletic fraternity" (p. 257). The 2004 study as well as the present study have shown that the feeling of belonging to the "elite athletic fraternity" transcends intercollegiate athletic divisions,

professional athletics, and amateur athletics. While some may view this as motivation to return as quickly as possible, others may feel dejected at the loss of support and prolong the rehabilitation process. Specifically, Podlog and Eklund (2004) suggest how this absence and fear of loss of status can be better described as an issue of relatedness for injured athletes. Thus, removing a sport from an athlete's life, the current participants being no exception, appear to challenge their perceived athletic identity. This sudden change may challenge their sense of self and may lead to symptoms of depression and anxiety, thus demonstrating the need for additional mental health resources within NAIA and NCAA DII and DIII athletic departments, particularly in times when athletes' identities are being challenged or changed entirely. The lack of appropriate mental health resources coupled with the apparent challenging of self and athletic identity appear to be major barriers to overcome during the rehabilitation phase, especially for athletes at the NAIA and NCAA DII and DIII level.

Results of the present study also highlighted the importance of limiting separation from teammates during rehabilitation. Although the feelings of isolation and separation were unique for each participant, it was frequently reported to have an early onset following the injury and subsequent surgery. This experience is not surprising as research has repeatedly demonstrated that isolation is often present following a season or career terminating injury (e.g., Bianco, 2001; Gould et al., 1997; Madrigal & Gill, 2014). In times of social and physical isolation, current participants relied heavily on athletic trainers to play a role in keeping them involved in team events whenever possible (e.g., inquiring if they could participate in a meeting, scheduling rehabilitation around team meals, integrating them back into team warm-ups or non-contact exercises as soon as

possible). However, such reliance on athletic trainers may be detrimental to NAIA and NCAA Division II and III athletes. Specifically, participants in the present study discussed frustration regarding the total number of athletic trainers available to cover the entire athletic department, sometimes as few as two or three. Research has consistently shown that athletic trainers are a central part of the rehabilitation process from both physical and psychological standpoints (Cormier & Zizzi, 2015; Driediger et al., 2006). Despite this, the relationships the participants were able to form with their athletic trainers were perceived to be more valuable than the actual number of staff members who were available to attend to them as they rehabilitated from their injuries. Thus, when resources may not be available to hire more athletic trainers, perhaps a worthwhile alternative would be to further emphasize building and maintaining relationships with other injured athletes. In addition, current participants appeared grateful for their (albeit limited) resources. In NCAA Division I settings, particularly in high profile sports, dissatisfaction often arises with having to share one athletic trainers amongst several athletes within a team (Unruh et al., 2005). Therefore, further research should investigate the expectations of resources and levels of satisfaction among athletes coming into intercollegiate athletics across all divisions.

In addition, particularly in team sports, teammates serve critical roles such as maintaining close relationships and offering multiple forms of support (e.g., emotional & tangible) especially during challenging times. In environments where coaching staffs are smaller and athletic trainer personnel are sparser, the importance of strong connections between teammates and friends was perceived to be especially important for the participants of this study. The separation from a familiar sport environment coupled with

the strong athletic identities held by participants magnified negative appraisals of the injury and the inability to compete caused additional emotional distress. An athlete removed from a team environment as a social consequence of recovering from an injury can experience stress responses and utilize maladaptive coping mechanisms (Claytor, 2019). The findings from the present study demonstrate the psychological benefits of finding ways to make sure injured athletes are frequently interacting with their teammates and the rest of their support system. Since athletes in the NAIA and NCAA DII and DIII setting frequently rehabilitate with less direct supervision from athletic trainers, it is important that the athlete who is injured still feels as though they are a valued member of the team. As such, to promote psychological well-being for athletes who are removed from sport, practitioners should keep the recovering athletes involved in team activities whenever possible, facilitate an environment of community in the athletic training facility with other athletes, and periodically ensure that recovering athletes have the perceived necessary resources available to rehabilitate successfully, for example.

The perceived loss of control throughout rehabilitation was also a consistent theme between participants. Specifically, participants discussed their inability to do things they normally would (e.g., driving, walking, carrying food), and the challenges that accompanied the necessary adjustments. Using a Division I case study sample, Madrigal and Gill's (2014) revealed how athletes may experience additional negative psychological responses due to immobility and not knowing when they would be cleared to return to competition. Participants in this study echoed these sentiments, however, reported receiving less attention during their injury recovery process and were thus less informed throughout its duration. It appears that sport commitment levels are similar to



those found in higher athletic divisions (e.g., Division I, semi-professional, etc.), therefore, many of the same psychological care options are needed for athletes at this level as well. Furthermore, Madrigal and Gill's findings demonstrated how athletes may experience supplemental stress when not being fully aware of the extent of their rehabilitation and when they may be returned to play. Relating back to athletic identity, many participants felt challenged by the idea that they could no longer be as independent as they were prior to their injury. This aligns with Giannone and colleagues' (2017) research, as participants in the current study perceived a lack of control in their recovery process and experienced a difficult role adjustment within the team setting. Therefore, it may be advantageous for an individual (e.g., athletic trainer, physical therapist) who has considerable exposure to the injured athlete to help facilitate this role adjustment, rather than putting full responsibility on the athlete to enact change on their own. Although NAIA and NCAA DII and DIII environments may have limited personnel resources, this role adjustment facilitation by a member of the rehabilitation team is of paramount importance to assist in easing the transition to a non-participatory role in sport.

In summary, the cost of ACLR was exemplified by the various feelings of loss or challenge the participants experienced. When athletes are required to relinquish a defining factor of what makes them who they perceive themselves to be, there will be significant emotional and psychological responses. This is consistent with Podlog and colleagues' (2015) research as well as Podlog and Eklund's (2009) findings regarding psychological responses related to identity shifts. In all, it appears that psychological costs are as significant as physical ones. To appropriately manage the varying appraisals athletes may have, those with significant exposure to the recovering athlete must foster an

environment of inclusion and engagement, rather than creating a divide between athlete and team. From a self-determination theory perspective, athletes need to feel a sense of relatedness and competence throughout their rehabilitation process. As several participants discussed, when injured they were completely isolated from the team while they did their rehabilitation exercises. In addition, in order for an athlete to be able to self-actualize, socially develop, and maintain a healthy psychological well-being, the three basic needs of self-determination theory need to be satisfied. Injury and extensive absences from sport contribute to the onset of negative psychological responses. However, with an approach to satisfy the individual needs of an injured athlete, particularly in a setting where resources of somewhat limited, the negative responses of injury can be mitigated.

The results of the present study demonstrate the similarities between NCAA DI athletes and NAIA and NCAA DII and DIII athletes and their responses to injury. This tells us that their rehabilitation protocols and resources should be the same; however, they are not. Thus, practitioners in these other divisions need to adapt. Because of fewer resources, additional sports medicine and mental health staff hiring is more challenging and athletic trainers are put in positions to serve multiple roles within the athletic department. Along with caring for athletes' physical ailments, athletic trainers must assist athletes who are injured stay integrated in team activities to avoid the perceived loss of experiences, facilitate any necessary role adjustments, as well as be attuned to any psychological distress.

### 5.3 Interventions and Psychological Resources

The final category emerging from the current study was named *interventions and psychological resources*. The information in this category pertained to the participants' utilization of coping mechanisms, elements of social support, and any psychological resources that may have positively influenced rehabilitation. This category contained information pertaining to the tenets of self-efficacy theory (Bandura, 1986) that were perceived to be particularly influential, as well as the attention paid to need fulfillment of self-determination theory (Deci & Ryan, 2000). Furthermore, it contributes a much-needed addition to the literature on sport-injury rehabilitation for the significant number of collegiate athletes who do not have a vast number of resources.

The results of the current analysis found that all participants described vicarious experiences as a critical component for a successful rehabilitation. Although modelling and vicarious experiences have received less attention in sport injury rehabilitation research (McCullagh & Weiss, 2001), each have been found to be a useful tool for motor skill acquisition, psychological response management, and behavior change in physical activity domains (McCullagh & Weiss, 2001; McCullagh & Weiss, 2002). Within the current results, participants' utilization of YouTube to search for and watch "Day in the Life" videos of other athletes with the same injury, coupled with physical proximity to other athletes who were rehabilitating, assisted in mitigating some of the negative psychological responses and facilitated behavior change, particularly if another athlete had a similar injury and was ahead of the other in their rehabilitation process. Participants in this study were able to use other rehabilitating athletes to assess their own progress as well as come to an understanding of what to expect from subsequent steps in their rehabilitation. This data lends support for the utilization of support groups for injured

athletes of various sports to come together to discuss their injuries and struggles. Athletes who are recovering may find this to be a validating experience because they are not alone in their struggles.

Participants in the present study discussed the value in having a partner or partners throughout rehabilitation. Specifically, one participant mentioned how she would measure her performance against another injured athlete and try to match her progress. This appears to be a valuable method for keeping athletes who are rehabilitating accountable, yet the research regarding the recovery gap between athletes is limited. If one athlete is coming off crutches and the other is running already, it would be worth investigating what, if any, role that plays. Results from Maddison and colleagues' (2006) study showed that self-efficacy amongst athletes who were rehabilitating was increased after being exposed to modelling videos or other individuals who were performing a similar behavior. Specific to ACLR rehabilitation, the idea of promoting motivation to adhere to rehabilitation through coupling rehabilitating athletes together requires further investigation. Modelling and vicarious experiences have been shown to help reduce an individual's perception of pain and anxiety (Maddison et al., 2006). Additionally, it was shown to increase an individuals' self-efficacy early in the rehabilitation process. This is especially important because as DeCarlo and colleagues (1994) demonstrated, if certain problems develop early in ACLR rehabilitation, they are more challenging to eradicate later in the rehabilitative process. The present findings demonstrate the undeniable value in giving athletes at this level who are injured relatable resources throughout their rehabilitation process. By providing an athlete who is injured with additional support resources, they may be better suited to handle the demands that are associated with

ACLR rehabilitation. In addition, because there is no way to control for who gets injured and limited personnel resources to offer an athlete individualized attention during rehabilitation may be unmanageable, encouraging an athlete to utilize YouTube for vicarious efficacy training or other forms of social media for relatable content during treatment may be a positive method of increasing motivation to adhere to rehabilitation.

Considering the perceived importance of rehabilitating with partners or support groups for current participants, it is not surprising that social support was described to be particularly influential throughout the rehabilitation process. Perhaps not surprisingly, social support has been shown to enhance the well-being of athletes who are injured by reducing negative emotions (Bianco et al., 1999), limiting isolation (Podlog & Eklund, 2004), and increasing motivation in rehabilitation adherence (Bianco, 2001; Evans et al., 2000). These were each salient themes in the present study as participants discussed their preference of being able to do their rehabilitation with others, rather than by themselves. Three categories of support were discussed by the participants, as well as the sources where those types of support are derived from. Emotional support referred to feelings of love and care, thus enhancing feelings of self-worth and increases the likelihood that an athlete may have stronger sport-injury related growth perceptions. Pizzari and colleagues (2002) emphasized how critical emotional support can be in the early stages of rehabilitation, particularly for rehabilitation adherence because the initial loss of ability to participate in sport and the fear of losing status within a team setting may bring on feelings of sadness, sorrow, anxiety, and frustration. This, in turn, may decrease motivation to participate in rehabilitation consistently. Current participants described emotional support coming from various sources to be especially important especially on

the first days when they were adjusting to their new roles and capabilities. Informational support is concerned with feedback and assistance in solving problems and managing obstacles through verbal or written information. This type of support was found to be particularly useful for the participants in the current study. Their knowledge of the injury and recovery process was enhanced therefore changing the appraisal of how controllable or uncontrollable the rehabilitation process would be. Thus, it is important for practitioners to offer athletes who are injured long-term, like those in the present study, appropriate information regarding their situation to keep them adequately informed regarding the expectations set forth in the rehabilitation protocol. This was important but not necessarily a focus of rehabilitation as most participants just wanted to do their exercises and didn't want to dwell on the injury itself. Finally, tangible support is direct assistance provided to someone. Tangible assistance was described as being driven places, carrying trays of food, or helping the participant get from one room to another. The reduction of the impact of certain stressors through tangible support was highlighted as an instrumental form of support and was perceived to be especially useful for the participants especially since their mobility was significantly challenged. This is an important finding because additional tangible support can also reduce an athlete's exposure to risky or stressful behaviors (i.e., hopping on one leg to the sink with a plate and a glass). Thus, this tangible support, grouped together with emotional and informational support, are of critical importance to assist in reducing some of the stressors which an athlete may experience throughout the injury recovery process.

Participants described the previously mentioned sources of support coming from friends, family, teammates, athletic trainers, and most importantly to 4 out of the 7

participants, from coaches. Of note however, research shows that certain types of support can only be offered by specific people, while some support can come from anyone (Malinauskas, 2008). This was echoed by the participants when they described how informational support from athletic trainers was far more valuable than when they would receive a similar kind of support from their parents, for example. Overall, perceived support provided the participants with reassurance of worth, positive relationships, perceived increased resourcefulness, and served as a method of shifting attention from their negative experiences. Thus, it is important for practitioners who have frequent exposure to athletes who are injured to offer information about the injury and recovery process during times that the practitioner can give individualized attention. Along with fulfilling the need for relatedness by getting individualized attention, athletes will receive a type of support that a limited number of people would be able to offer due to athletic trainer and physical therapist expertise.

Though social support can, and should, come from anyone, receiving it from coaches was identified as particularly influential for a successful rehabilitation by current participants. Athletes who are injured often fear they will be “brushed aside” and the subsequent loss of attention from coaches exacerbates the negative emotions associated with the injury, and potentially prolonging the rehabilitation timeline (Malinauskas, 2008). Social support from a coach depends significantly on the phase of injury that an athlete is in (Bianco, 2001). For instance, Bianco discusses how the quality and quantity of social support has different impacts on an athlete across the pre-injury phase, the rehabilitation phase, and the post-injury, return-to-play phase. The findings of the present study demonstrate how in each phase of the injury, athletes have different expectations of

the type of support their coach offers. For instance, findings from the current study showed that positive adherence and subsequent rehabilitation outcomes could be facilitated by a coach offering emotional support as well as personal anecdotes about their own previous injuries which may be relatable to the athlete who is injured. During the rehabilitation phase, support from the coach is welcomed and appreciated but varies depending on the athlete-coach relationship (Malinauskas, 2008). Therefore, it is important for coaches to foster positive relationships with each member of the team, regardless of level of contribution at a certain point in the season. In the final phase of rehabilitation, Hoar and Flint (2008) discuss how coaches should provide encouragement and reassurance to the athlete and not engage in pressure to perform until the athlete is ready. This finding is important and serves as a critical theme throughout the present study because it shows the importance of each member of the rehabilitation team understanding that psychological and physical readiness to return is not synonymous. Coaches, according to Bianco (2001) and Johnston and Carroll (1998), should continue to be a source of emotional and informational support for the athletes, particularly regarding any setbacks associated with return to play, any potential role changes or status changes within the team, and to assist the athlete in setting realistic goals and overcome reinjury anxieties. Considering the value the current participants saw in receiving social support from their coaches, from a self-determination theory perspective, offering consistent support throughout the injury and rehabilitation process is critical to fulfill the athletes' need for relatedness. This finding pertaining to social support from coaches is important because it is likely the leading method of reducing an injured athlete's fear that they are no longer valued within the team setting.



Psychological resources were also identified as crucial factors for a successful ACLR rehabilitation. This property was comprehensive, encompassing psychological skills, the identification of sport injury-related growth, and mental health resources, both sport and non-sport specific. Current athletes discussed the utilization of mental skills as a method of encouraging themselves, sustaining motivation, and mitigating the negative emotions they experienced throughout their ACLR rehabilitation. Similar to Johnston and Carrol's (1998) findings, participants found goal setting and meeting benchmarks positive regarding motivation and rehabilitation adherence. This finding is important because it supports the recommendation to encourage athletes in rehabilitation to develop short-term process goals. ACLR rehabilitation is an extensive undertaking and short-term process goals may be a useful method to assist athletes in building confidence in their physical and psychological capabilities.

Findings from the present study were similar to Salim and Wadey's (2019) findings regarding journaling during rehabilitation and the potential alleviation of stress it may allow. Journaling was identified by participants as a functional method of managing stress associated with the injury. Due to the likelihood that a mental health professional may be unavailable in this setting, encouraging athletes recovering from injury to use journaling as an outlet may be an advantageous method of mitigating some of the negative psychological responses that come with injury. Within the journal entries, athletes may be able to discuss motivations to return to sport and discuss any return to sport apprehension they may have. Finally, imagery was discussed by participants as a method of maintaining psychological well-being throughout their rehabilitation. Participants discussed seeing themselves back on the field or court at their preinjury

levels of performance. Consistent with the findings of Driediger and colleagues (2006), the findings from the current study showed support for using imagery as a method of shifting attention from injury rehabilitation to the athletes' return to sport. Thus, it would be advantageous to offer information about what imagery is and how to use it for those who may not know. Subsequently, this would give rehabilitating athletes guidance on how to manage stress through rehabilitation as well as psychologically prepare for a return to sport. The findings from the present study highlighted the need for the utilization of psychological skills by athletes navigating the long-term sport injury landscape at any level of collegiate sport participation. Thus, practitioners should be comprehensively trained on how to incorporate psychological training and rehabilitation into the physical rehabilitation protocol.

Although the rehabilitation process was challenging, extensive, and monotonous at times, results of the present study identified sport related-injury growth as a motivational influence throughout treatment. Findings of the present study, consistent with Podlog and Eklund's (2005) study regarding personal outlook on sport and the intrinsic joy associated with it, found that injured athletes may gain a renewed perspective on the importance of sport in their lives, thus facilitating self-actualization and personal growth. The idea that NAIA and NCAA DII and DIII are less competitive and require less investment because of fewer fans is misguided. By encouraging athletes to reflect on their experiences in sport, both positive and negative, a renewed perspective around the meaningfulness in sport may be provoked. Thus, having practitioners assist athletes with these reflections may yield positive results on adherence motivation for an athlete going through rehabilitation. Additional indicators of sport related-injury growth

may be enhanced emotional regulation (Wadey et al., 2011) and strengthened relationships (Salim et al., 2016). Surprisingly, participants discussed an emotion similar to gratitude for the injury, as it helped them realize they were previously taking the sport for granted. The idea of gratitude for an injury requires further research regarding the desire for a break from sport, the desire to discontinue sport, or the search for a reason as to why their playing time has been decreased, for example. Participants also discussed enhanced hardiness, both physically and mentally. They identified the injury rehabilitation period as a time where they realized they were more capable than once thought. As the current participants experienced more stressful or traumatic situations, the more physically and psychologically resolute they became. Considering these findings, practitioners may encourage athletes rehabilitating from injury to reflect upon their athletic careers and how overcoming some of the more challenging experiences thus far can assist their personal growth efforts through rehabilitation.

An overarching theme of this portion of the study was how physical and psychological readiness to return to play were not synonymous. Findings from the current study describing the physical and psychological recovery involved in injury and the necessity for practitioners to offer significant attention to both throughout the rehabilitation. Participants identified a disconnect between athletic trainers' abilities to identify physical and psychological readiness to advance in rehabilitation and subsequently return to competition. However, athletes identified a human-first approach from their medical team as a major factor in what made them feel more comfortable throughout rehabilitation and more confident in progression. Person-centeredness was defined by Jesus and colleagues (2016) as a method of delivering healthcare based on a

patients' needs, preferences, and expectations, and "fully involving the persons' perspectives into care" (p. 1). Although it is widely identified as a valuable method of patient care, there is a dearth of research on the topic, particularly in the sport injury domain. The person-centered approach promotes autonomy in the rehabilitation process, which participants in the present study also identified as a key motivational factor in their adherence to their rehabilitation. Thus, there is a necessity to approach athletes who are injured from a human-first perspective while also providing opportunities to foster their feelings of autonomy during rehabilitation.

Finally, mental health resources, both sport and non-sport specific, were identified as factors that could contribute to a successful rehabilitation. Because some participants were not familiar with sport psychology and had limited access to a sport psychologist, they identified college counselors or psychologists they found on their own as valuable resources throughout the injury process. One study reported that less than 50% of university students were familiar with university counseling services (Kahn et al., 1999), only 14% of students could locate the counseling center on campus, and only 9-15% utilized the counseling services (Gallagher, 2005; Yorgason et al., 2008). Consistent with findings in the current study, Yorgason and colleagues' (2008) findings demonstrated that low utilization rates were due to lack of time and skepticism that the services wouldn't be helpful to the participants. Also, worth noting, athletic culture discourages athletes from seeking outside help and could be a contributing factor to why athletes, particularly those who are injured, may not be utilizing counseling services (Day, 2011). Therefore, practitioners should facilitate introductions to mental health professionals if that resource is available. Additionally, mental health distress information should be provided to

practitioners who have frequent access to athletes who are injured in order to best serve them when symptoms of psychological discomfort are present.

The likelihood of psychological distress during injury rehabilitation is high, therefore access to mental health resources for athletes is necessary. However, at the NAIA or NCAA DII and DIII levels, resources are likely limited and hiring a new staff member to take on the student-athlete mental health role exclusively is often not feasible. While campus counseling centers are one resource, this isn't always the resource of choice for athletes who may not feel validated or understood by the counselors in those roles, as shared by current participants. Athletic trainers serve as "front line counselors" for many of these athletes and should be given training to be able to comfortably fill that role as well along with their primary role. Consistent with Cormier and Zizzi's (2015) findings in a sample ranging from professional to high school athletics, current participants' athletic trainers served dual roles in aiding physical issues while also being a mental health resource. Considering these 2015 findings as well as the findings in the present study regarding the roles athletic trainers played, athletic trainers at the NAIA and NCAA DII and DIII levels should be trained to do the same. The ability of an athletic trainer to identify and subsequently refer is highlighted here because even though athletic trainers can receive training to assist, additional help needs to be present for when cases become more severe. By offering an athletic trainer the appropriate skills to identify psychological distress and then facilitate an interaction between a mental health professional and a student-athlete will create an environment where practitioners can better serve the athletes under their care.

#### 5.4 Study Summary

The purpose of this study was to explore the experiences of NAIA and NCAA DII and DIII athletes who have undergone ACLR surgery and to understand their motivation to adhere to their rehabilitation protocols throughout the extended process. NAIA and NCAA Division II and Division III athletes account for nearly 67% of college athletes in the United States (NCAA.com; NAIA.org). Despite being such a large percentage of collegiate athletics and athletics in this country, research has remained limited on individuals in these populations. Furthermore, research regarding NAIA and DII and DIII athletes and their psychological responses to long-term injury is even more limited. Some research (e.g., Forsdyke et al., 2016; Ivarsson et al., 2017) has shown that positive outcomes from ACLR rehabilitation relies heavily on consistent adherence to sport injury rehabilitation plans. Thus, the relationship between self-efficacy and motivation to adhere to rehabilitation plans following ACL reconstruction was explored in this study. More specifically, athletes who participate at the NAIA and NCAA DII and DIII levels shared their experiences navigating the rehabilitation process with the resources available to them, while some were also navigating this process during the COVID-19 pandemic.

Participants in this study were seven female NAIA and NCAA DII and DIII athletes. Participants were recruited using purposive snowball sampling across the three intercollegiate athletic associations in the United States. At the time of the interviews, each of the participants competed in their respective sports and had successfully recovered from their ACLR. Participants were invited to participate in the study based on seven criteria. First, they must have had a unilateral ACL tear and subsequent reconstructive surgery. Second, they must not have had any previous ACL injury history. Third, they must not have had any meniscal pathology. Fourth, they must have been 9-20

months post-surgery date. Fifth, the participants must have been cleared to return to play. Sixth, the participants must have been injured while playing a sport. Seventh, their only injury must have been an ACL tear. Once these criteria were established, participants were sent a demographic survey and the GRAS (Naqvi et al., 2020) to assess rehabilitation adherence. Following analysis of the GRAS scores, participants with particularly high levels of adherence were invited to interview via Zoom videoconferencing software at a mutually agreed upon time for a period varying from 30-35 minutes.

A qualitative method guided by a semi-structured, open-ended interview which was aimed at exploring the experiences of NAIA and NCAA DII and DIII athletes rehabilitating from ACL reconstructive surgery was employed for this study. From the analysis of the data, three higher-order categories emerged. These categories were labeled *athlete characteristics and experiences*, *cost*, and *interventions and psychological resources*. *Athlete characteristics and experiences* pertained to physical and psychological athlete characteristics, personal attributes, and previous experiences as an athlete, including previous injuries. *Cost* contained information about participants losing normalcy in their lives, feeling like their athletic identity was challenged, participants questioning their purpose without sport, and the loss of experiences they would have otherwise had. This category described the psychological impact that injury had on the participants. Finally, *interventions and psychological resources* included information about coping mechanisms that the participants used, any forms of support that were present and were perceived to play a role, and any psychological factors which influenced

rehabilitation. This category described the participants' used strategies for navigating the substantial time away from sport.

Despite the distinctive nature of each participant's upbringing, athletic career, and injury experience, common themes emerged from the data. To start, similarities were found between participants in their introduction to sport and subsequent sport specialization. Similarities were noted in the ways that participants built and maintained relationships and developed a strong athletic identity. Participants noted how their strong athletic identity was strongly related to the success they'd had in the sport. Additionally, similarities were found in the shared feelings of loss or the cost associated with injury. Participants discussed the psychological impact of the injury, fear associated with the injury and future injuries, as well as the trepidation they experienced prior to returning to sport. The participants also discussed the impact that being away from the team during rehabilitation and not being able to travel to away games had throughout their recovery process. The importance of not isolating themselves was shared between participants. A shared opinion between athletes was also that physical and psychological readiness to return to sport is not synonymous and requires additional attention. Finally, participants mentioned the value of social support throughout the rehabilitation process. Specifically, emotional support from coaches was noted as paramount to maintain motivation throughout rehabilitation. Participants discussed the value stemming from vicarious experiences and the psychological skills they developed throughout their extensive rehabilitation period. The development of psychological skills for some participants was due to the utilization of a sport or clinical psychologist, while others who did not have that resource developed skills through their own research on the topic.



## 5.5 Conclusions

Within the confines and limitations of the current study, the following conclusions appear warranted:

- Each athlete participated in a variety of sports during their childhood but began to narrow their focus on one or two sports as they became more serious about playing in college. Where some athletes focused on one sport, one focused on two sports until high school graduation, while another continued to play two sports in college.
- Each participant suggested that their strong athletic identity contributed to their athletic success thus far.
- Each participant felt as though their previous sport and injury experiences contributed to their ability to persevere through the challenges that injury rehabilitation presented.
- The participants each experienced significant emotional difficulty starting at the injury onset and persisting throughout the first half of the rehabilitation in particular.
- The participants felt as though their strong athletic identity was being challenged as they were not able to participate in their sport.
- Being separated from the team environment and being tasked with rehabilitation instead of being at practice or being able to travel served as a detriment to motivation to adhere.

- The perceived loss of control in the participants' rehabilitation was difficult, especially because the participants described themselves as very independent.
- The perception of being restrained by athletic trainers and physical therapists during rehabilitation negatively impacted motivation.
- The participants appeared content with their seemingly understaffed athletic training team.
- Participants shared the opinion that seeing others progress through rehabilitation or execute rehabilitation exercises simultaneously had a positive influence on motivation to adhere. Having someone to model their rehabilitation efforts after served as an influential component in the rehabilitation equation.
- The utilization of rehabilitation groups may help to validate athletes recovering from injury.
- Each participant shared how building strong relationships with athletic trainers and physical therapists was of paramount importance for motivation adherence. If the participant was looking forward to being in the athletic training facility, they were more likely to show up with a better attitude.
- Informational, tangible, and emotional support were each seen as critical components of the rehabilitation process. Emotional support was agreed upon by the participants to be the most impactful source of support during rehabilitation.
- Social relationships during rehabilitation were perceived to be especially valuable to serve as an avenue to avoid isolating themselves.

- Emotional support coming from the coach of the participants' team was seen as especially influential on motivation. Verbal persuasion from the coach was a must-have for each of the participants.
- Coping mechanisms such as journaling, self-talk, and deep breathing were especially useful for the participants, especially on more challenging days where motivation was lacking.
- A human-first approach by athletic trainers, physical therapists, coaches, friends, and other people the participants interacted with were especially important because it fostered a feeling of belonging and like people really cared for them as people rather than just as athletes.

## 5.6 Practical Implications

The present study added to the literature on sport-injury rehabilitation by offering much needed attention to the underserved population of NAIA and NCAA DII and DIII athletes. As previously mentioned, there is a dearth of research regarding this population of athletes. This lack of attention to such a large sample of athletes is problematic for many reasons, but particularly because the injury incidence is nearly as high as NCAA DI and professional sports (Hootman et al., 2007), and without adequate resources, athletes who are injured may suffer and experience suboptimal rehabilitation outcomes. The current study has begun the process of addressing these overlooked athletes and can be used to create a plan for how to better serve injured athletes who are not at NCAA DI schools or at the professional or Olympic level where resources are seemingly unlimited. Participants revealed that previous injury recoveries and athletic experiences were valuable to consider when struggling to persist through rehabilitation. Thus, athletic

trainers, physical therapists, and sport psychology professionals should encourage athletes who are injured to compile previous accomplishments in the sport domain to serve as a motivational addition to their rehabilitation.

Furthermore, this study provided insight into the experiences of cost and loss for collegiate athletes who strongly identify with their athletic identity. Specifically, athletic trainers, physical therapists, and sport psychology professionals can use the results of the current study to increase awareness for athletes who are injured and experiencing these feelings of loss. The current results illustrate how a loss of experiences, the perception of “missing out”, and challenging ones athletic identity can each detract from an athlete’s motivation to adhere to rehabilitation. The separation from teammates and friends facilitates a feeling of isolation for an athlete who is injured and can prove to be especially negative. This study provided information for what to look for when athletes may be experiencing some of these more negative feelings during rehabilitation. The current study encourages further investigation of this research with this population of athletes to create interventions to be used at various parts of the rehabilitation process.

The current findings may also have practical implications for how social support and vicarious experiences may be used to facilitate greater rehabilitation adherence for athletes navigating an extended rehabilitation process. As previous research has suggested, emotional support from an athlete’s head coach has facilitated motivation for an athlete who is injured and assists an athlete when considering whether they are still in the coaches’ plans when the athlete is ready to return. The present findings suggested that while tangible and informational support from friends, teammates, and staff are of value, emotional support and a human-first approach help athletes who are injured feel like they

are seen as more than just an athlete and can be seen for the other qualities which they possess, which may yield further positive rehabilitation outcomes. Regarding vicarious experiences, participants in the current study cited having other individuals rehabilitating simultaneously was motivational in nature. Additionally, having rehabilitation models either in person or through a media outlet like YouTube contributed to motivation, as the participants were able to see what they had to look forward to and were able to measure their progress with another athlete who was injured. Finally, because it is uncommon for programs at this level to have a sport psychology professional, multiple athletic trainers, and other necessary rehabilitation specialists on staff, we need to ensure that these student-athletes are getting access to adequate care. Ways to facilitate the proper care may be through creating social support groups with other injured athletes, partnering with organizations with additional resources that may fit the school's budget, and by providing athletic trainers with the necessary training to comfortably perform in the role of front-line counselor.

## 5.7 Limitations

Although the study enhanced the understanding of the experiences of NAIA and NCAA DII and DIII athletes throughout ACLR and return to sport, there were limitations. First, the only respondents to the study were female. While this was intentional for continuity purposes, the findings are therefore limited in generalizability, since it has been suggested that gender differences exist throughout the rehabilitation process (e.g., Granito, 2002; Lisee et al., 2020). Future research may do a similar study and compare these findings with the results of a male sample of athletes of the same athletic level. Next, these results are only applicable to athletes who compete in team

sports. It would be advantageous to do a similar study with individual sports like tennis or golf, for instance. Third, these results are exclusive to American athletes. Perceptions of what is more motivational for athletes with different backgrounds may be worth investigation. Fourth, these results may not be applicable to athletes whose collegiate eligibility has expired and will not be pursuing sport following the completion of their rehabilitation and graduation from school. Next, while the data is rich in content, the study was qualitative and thus had fewer participants. While this was intentional, it is still limiting for the generalizability of the research. Additionally, the GRAS relied on student-athletes to self-report responses (e.g., commitment to rehabilitation exercises, skipping sessions), which may have influenced who was invited to participate in the interviews versus who was not invited. Regarding the GRAS cut-off score, because it was originally published in the Urdu language and there was potential for inaccurate translations, it may not be a valid measure of adherence for an English speaking sample. Finally, the recruitment and interview portion of this study was conducted during the COVID-19 pandemic. Only athletic trainers whose emails were listed on college or university athletic department websites were contacted, thus leading to some selection bias. Additionally, several athletic trainers and students were not physically on their college campuses thus making athletic trainer contact with student-athletes significantly more challenging. This made recruitment more challenging and was a contributing factor for why finding participants was so much more difficult.

## 5.8 Recommendations for Future Research

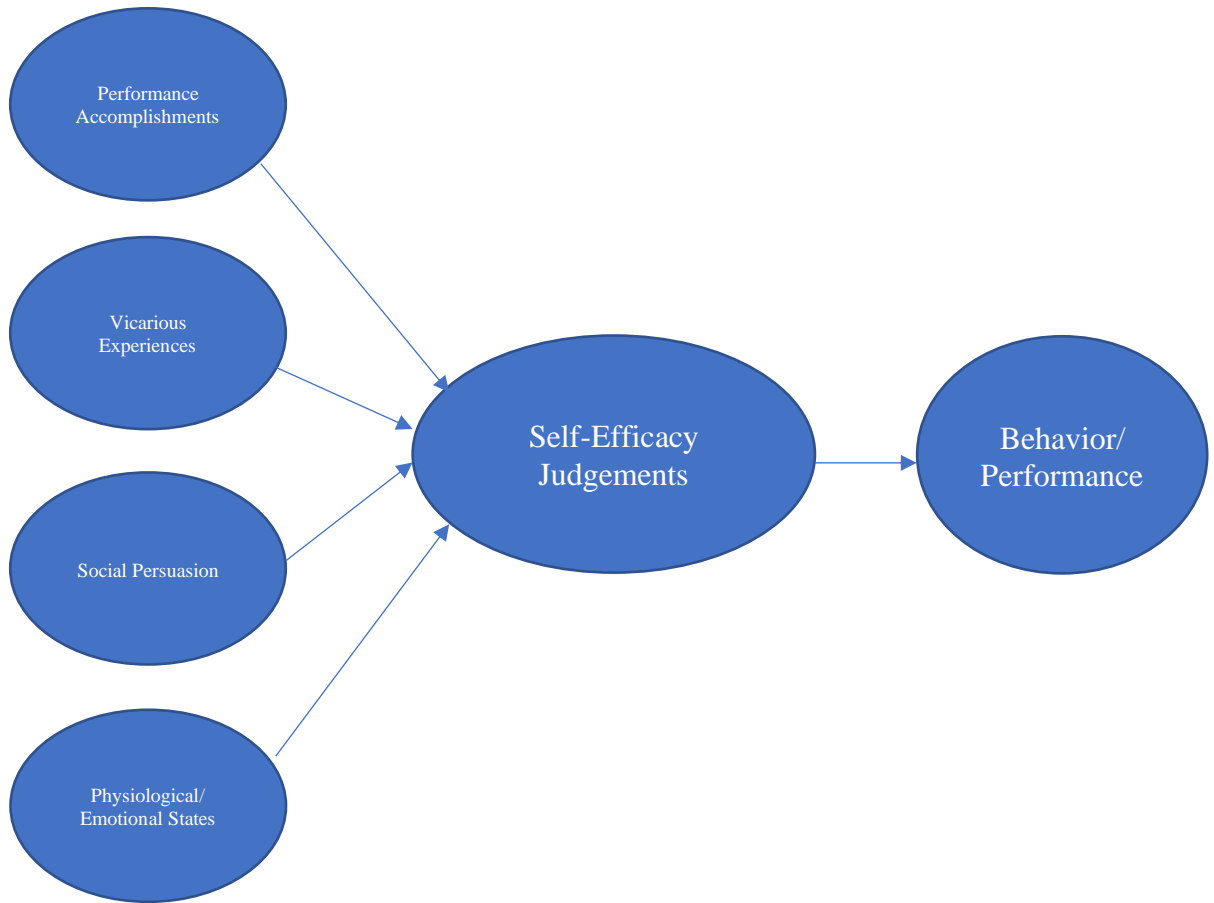
This was an exploratory study of the experiences of collegiate athletes who are injured. The objective was to address the gap concerning NAIA and NCAA DII and DIII

athletes as it related to motivation to adhere to rehabilitation protocols post-ACLR. Since there is minimal research in the area, future research could take several directions regarding adherence to rehabilitation for athletes who may not have seemingly unlimited resources. For instance, it may be interesting to focus on self-efficacy interventions to use with athletes at various points of their rehabilitation when motivation appears to be low. It would also be advantageous to do a similar study with a male sample of athletes to compare experiences and how these athletes may be better served by athletic trainers, physical therapists, and sport psychology practitioners.

While the study focused on NAIA and NCAA DII and DIII athletes, future studies could focus on NCAA DI, professional, and Olympic level athletes who are rehabilitating from injury. Sport participation rates are steadily increasing which creates more exposure hours to sport, thus increasing the prevalence for injury. Athletes commit significant resources to sport and being able to properly serve them particularly when they are unable to participate in sport is of paramount importance. Despite the limitations of the study, the results of this study are a first step in furthering the research for a consistently underserved population of athletes.

APPENDIX A

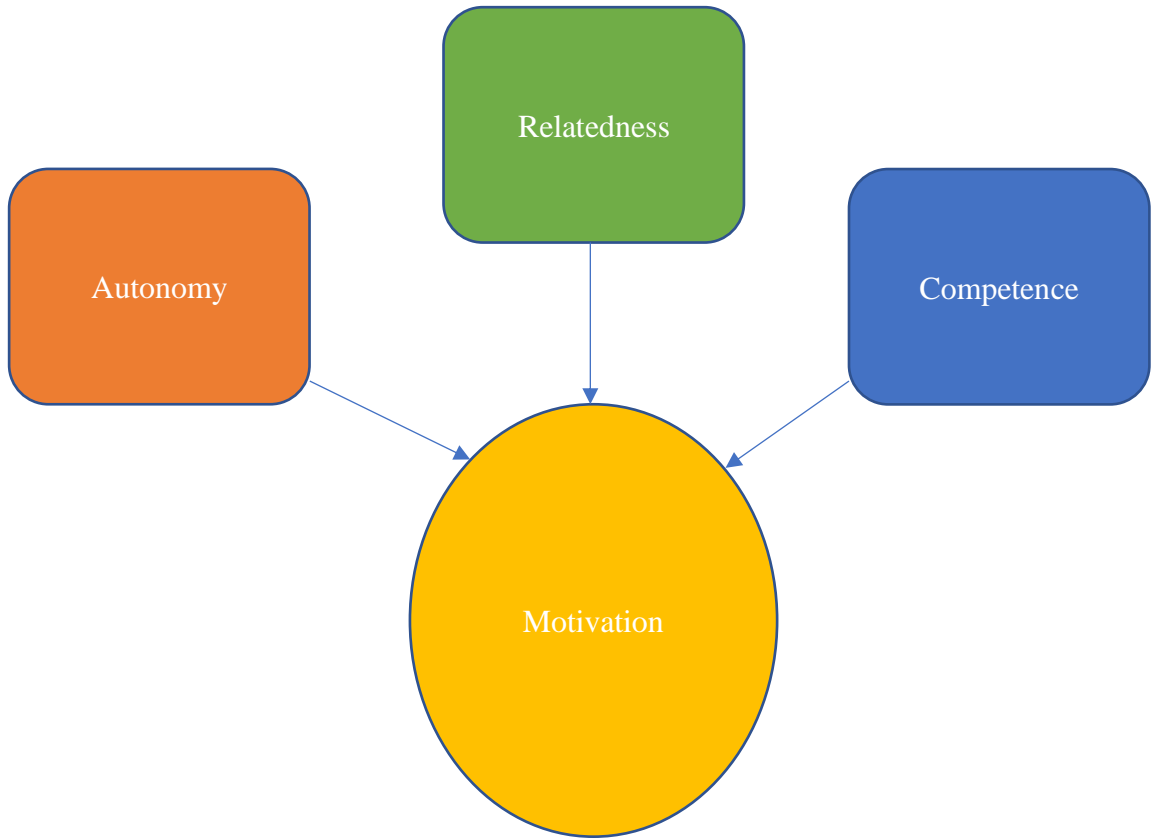
**Self-Efficacy Theory**





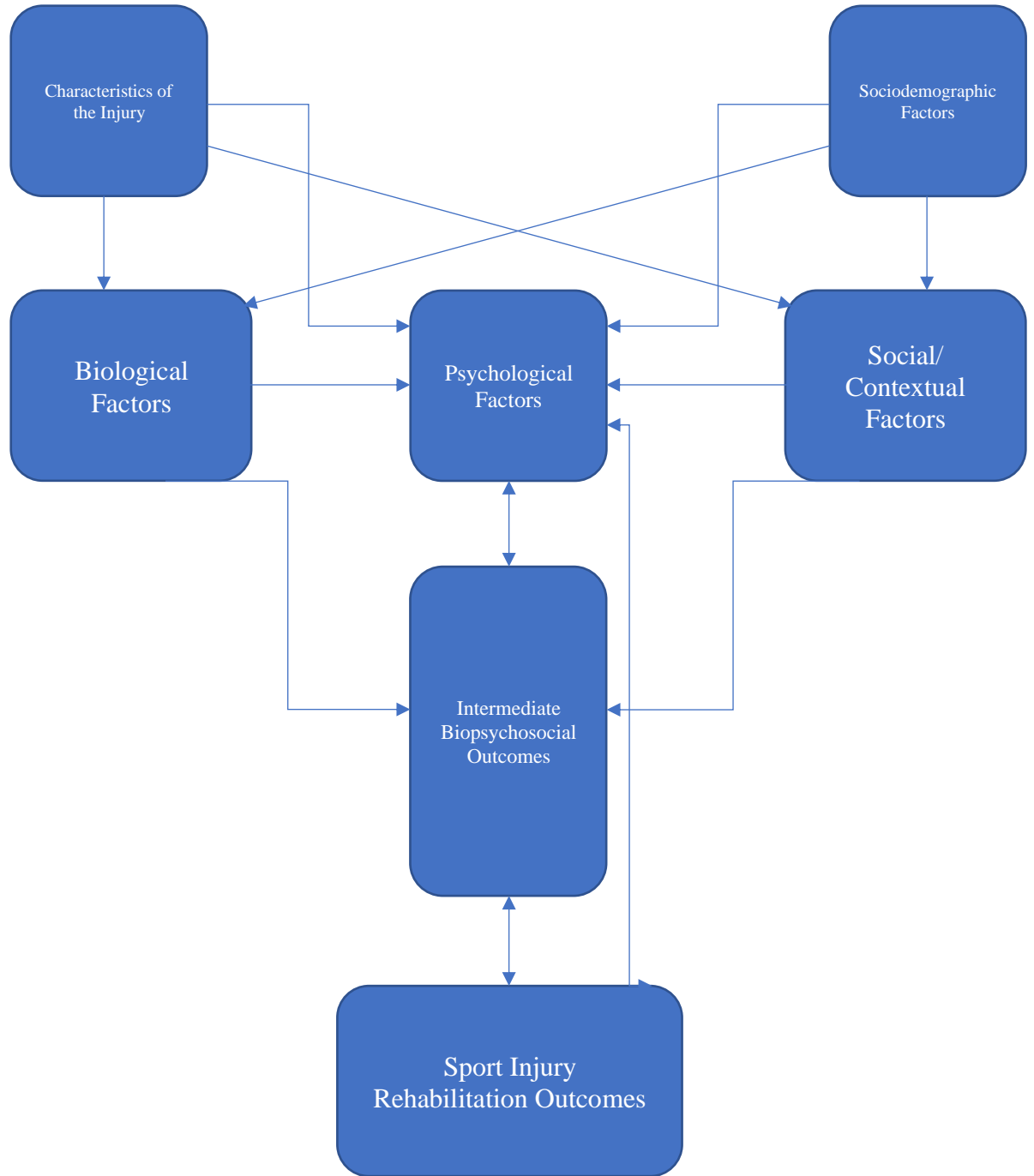
APPENDIX B

**Self-Determination Theory**



APPENDIX C

**Biopsychosocial Model**



## APPENDIX D

### Demographic Survey

What is your age in years?

What is your gender identity?

- Male
- Female
- Nonbinary/third gender
- Prefer to self-describe\_\_\_\_\_

What is your race?

- American Indian or Alaskan Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White
- Prefer not to say
- Prefer to self-describe\_\_\_\_\_

Are you of Hispanic, Latino/a/x, or of Spanish origin? (one or more categories may be selected)

- No, not of Hispanic, Latino/a/x, or Spanish Origin
- Yes, Mexican, Mexican American, Chicano/a/x
- Yes, Puerto Rican
- Yes, Cuban
- Yes, Another Hispanic, Latino/a/x or Spanish Origin
- Some other race, ethnicity, or origin
- Prefer not to say
- Prefer to self-describe\_\_\_\_\_

What sport do you play?

What is the highest level of sport you've played?

- High school
- AAU
- Junior College
- NAIA
- NCAA Division III
- NCAA Division II
- NCAA Division I
- Semi-professional
- Professional

How long has it been since your injury?

How long has it been since your reconstructive surgery?

If known, what type of graft was used in your ACL reconstructive surgery (e.g. Bone-Patellar Tendon-Bone, Allograft, Autograft, Hamstring, Quadriceps, Synthetic)?

## APPENDIX E

### **Recruitment Letter**

Dear (individual title and name),

My name is Myles Englis and I am a master's student in the Kinesiology and Health Promotion Department at the University of Kentucky. Under the supervision of my thesis advisor, Dr. Marc Cormier, I am conducting my thesis research to explore self-efficacy among collegiate athletes post-anterior cruciate ligament reconstruction surgery to better understand what may contribute to stronger rehabilitation adherence and an overall successful rehabilitation.

I am seeking your assistance to participate in a short survey and 60-minute Zoom interview where you will be asked to respond to open-ended questions regarding your rehabilitation experience, motivation, and rehabilitation outcomes.

In order to qualify for the study, participants will be required to meet the following criteria:

- a) You have suffered a unilateral tear,
- b) Have no history of ACL injury,
- c) Have no meniscal pathology,
- d) Are 9-20 months post-op and have been cleared to return to play, and
- e) You were only injured while playing a sport.

If you wish to participate or have any questions, please contact Myles Englis at [myles.englis@uky.edu](mailto:myles.englis@uky.edu).

Thank you for your time and consideration,

Myles Englis

## APPENDIX F

### **Interview Invitation**

Dear (Athlete Name),

I would like to thank you for your participation in the study thus far. After reviewing your scores on the General Rehabilitation Adherence Scale, we would like to invite you to participate in an interview regarding your rehabilitation experience and motivation throughout the recovery process. An additional informed consent file will be sent to you via email. If you have any comments or concerns about the informed consent, please do not hesitate to reach out.

This interview will take place on Zoom and will last between 45 and 60 minutes. This interview is optional, and if you do not wish to participate, there is no problem. During the interview, you may skip any questions at any time for any reason.

If you wish to participate, please respond to this email and we will schedule a date and time for your interview. Two days prior to your interview, I will send you a reminder email with a link to our Zoom meeting and any other information you may need to know.

Thank you for your participation thus far and I look forward to hearing from you.

Myles Englis (primary investigator)  
University of Kentucky Department of Kinesiology and Health Promotion  
Phone: 706-266-0112  
Email: myles.englis@uky.edu

## APPENDIX G

### General Rehabilitation Adherence Scale (GRAS) (Naqvi et al., 2020)

Please choose the most appropriate answer for each of the following questions according to you physical therapy adherence.

1. Do you discontinue your physical therapy sessions because of other commitments?

Always                      Mostly                      Sometimes                      Never

2. Do you discontinue your physical therapy sessions because you have difficulties managing time?

Always                      Mostly                      Sometimes                      Never

3. Do you discontinue your physical therapy sessions when you feel well?

Always                      Mostly                      Sometimes                      Never

4. Do you discontinue your physical therapy sessions due to excessive pain caused by its intervention?

Always                      Mostly                      Sometimes                      Never

5. Do you discontinue your physical therapy sessions because you find it difficult to pay treatment cost?

Always                      Mostly                      Sometimes                      Never

6. Do you discontinue your physical therapy sessions because they are not worth the money?

Always                      Mostly                      Sometimes                      Never

7. In the last month, if applicable, did you skip your session when your guardian or caregiver was not available to accompany you to the clinic?

Yes    No    N/A

8. In the last month, did you skip your session when your physical therapist was not available, but another therapist was?

Yes    No    N/A

## APPENDIX H

### Interview Guide

- Tell me about your athletic career so far.
- In as much detail as you're comfortable sharing, please describe your ACL injury.
- Tell me about your rehabilitation experience.
  - What motivated you?
  - What made you come back day after day or what do you feel contributed to your adherence?
  - What did a good day look like? What did a challenging day look like?
  - What discouraged you?
  - Describe any goals, objectives, or benchmarks that were integrated into your rehab.
    - What role did they play?
- How was your progress evaluated throughout your rehabilitation?
- What factors contributed to your successful rehabilitation from this injury?
  - Knowing what you know now, what does it take to successfully rehab and return to play?
- Describe your confidence throughout the process.
  - Were you confident you could successfully return to play?
  - What factors contributed to this?
- What factors impacted the mental side of your rehabilitation?
  - If a person: How did this person/these people play a role in the mental side of your rehabilitation?
    - Do you think your interactions with this person help or hurt the rehabilitation process?
    - Tell me about your social interactions with your social support system(s) (teammates, coaches, outside friends, family) while you were injured.
    - How did these interactions change between the phases of your rehabilitation (first injured vs. in rehab vs. post-rehab)?
  - If an event: What about this event was valuable for your rehabilitation?
- What resources do you wish you had during your rehabilitation that you didn't?
  - How do you think these changes would impact the psychological side of rehabilitation from injury?
- Do you have anything to add about your rehabilitation process that we missed?



## APPENDIX I

### Interview Reminder Email

Dear [insert participant name]:

Thank you for participating in our study. This email serves as a reminder for our interview on \_\_\_\_\_ via Zoom. An email will be sent to you at least 20 minutes before the start of your scheduled interview. In order to join the Zoom meeting please follow the instructions provided in the email.

As a reminder, your interview will be voice recorded. Only the members of the research team will have access to the recording of your interview or transcripts of your interview. We will make every effort to keep confidential all research records that identify you to the extent allowed by law.

Your information will be combined with information from other individuals taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be personally identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private.

If you have any questions or need to reschedule your interview, please contact me ([myles.englis@uky.edu](mailto:myles.englis@uky.edu)) or my thesis advisor, Marc Cormier, Ph.D. ([marc.cormier@uky.edu](mailto:marc.cormier@uky.edu)).

Thank you,  
Myles Englis  
Master's student, Sport and Exercise Psychology Program  
University of Kentucky

APPENDIX J  
Categories and Properties

Categories and Properties	n	Sophia	Mia	Abby	Luna	Gabby	Natalie	Alex
<b>Athlete Characteristics and Experiences</b>	<b>209</b>	<b>24</b>	<b>21</b>	<b>28</b>	<b>25</b>	<b>23</b>	<b>49</b>	<b>39</b>
Athlete Make-up	126	13	13	17	15	12	29	27
Previous Injury	83	11	8	11	10	11	20	12
<b>Cost</b>	<b>169</b>	<b>17</b>	<b>22</b>	<b>20</b>	<b>19</b>	<b>29</b>	<b>33</b>	<b>29</b>
Loss of Athletic Identity	42	7	9	3	6	2	9	6
Limiting Separation	65	4	9	9	6	13	15	9
Loss of Control	62	6	4	8	7	14	9	14
<b>Interventions and Resources</b>	<b>317</b>	<b>31</b>	<b>35</b>	<b>47</b>	<b>60</b>	<b>48</b>	<b>38</b>	<b>58</b>
Vicarious Experiences	73	8	9	10	17	13	9	7
Social Support	161	30	14	20	22	33	21	21
Psychological Resources	83	11	11	10	13	11	13	14
<b>Totals</b>	<b>695</b>	<b>72</b>	<b>78</b>	<b>95</b>	<b>104</b>	<b>100</b>	<b>120</b>	<b>126</b>

APPENDIX K

Properties and Tags

<b>Properties and Tags</b>	<b>n</b>	<b>Sophia</b>	<b>Mia</b>	<b>Abby</b>	<b>Luna</b>	<b>Gabby</b>	<b>Natalie</b>	<b>Alex</b>
<b>Athlete Make-up</b>	<b>126</b>	<b>13</b>	<b>13</b>	<b>17</b>	<b>15</b>	<b>12</b>	<b>29</b>	<b>27</b>
Psychological Characteristics	21	3	2	4	3	1	4	4
Strong Athletic Identity	47	3	4	7	6	4	8	15
Self-doubt	5	0	0	0	0	1	4	0
Performance Accomplishments	3	2	0	0	0	0	1	0
Changing Expectations	4	0	2	0	0	0	2	0
Accepting/Seeking Help	7	1	0	2	1	0	1	2
Experiencing Emotional Barriers	10	1	1	2	1	2	2	1
Identifying Areas of Growth	9	1	2	0	1	1	3	1
Propensity to Over Adhere	4	0	0	0	0	2	0	2
Youth Athletic Experiences	16	2	2	2	3	1	4	2
<b>Previous Injury</b>	<b>83</b>	<b>11</b>	<b>8</b>	<b>11</b>	<b>10</b>	<b>11</b>	<b>20</b>	<b>12</b>
Emotional Previous Injury Experience	19	4	3	1	3	1	6	1
Psychological Impact of Injury	13	1	1	3	1	2	4	1
	10	0	1	2	2	0	2	3

Setting Rehab Timeline Expectations								
Fear Associated with Injury	<b>16</b>	3	1	1	1	3	3	4
Lengthy Rehab Experiences	<b>5</b>	1	0	1	1	1	1	0
No Previous Serious Injury	<b>7</b>	1	1	1	1	1	1	1
Mental/Physical Readiness	<b>13</b>	1	1	2	1	3	3	2
<b>Identity Struggles</b>	<b>42</b>	<b>7</b>	<b>9</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>9</b>	<b>6</b>
Finding Purpose Without Sport	<b>7</b>	2	3	0	0	0	1	1
Discovering Interests Outside Sport	<b>5</b>	0	3	0	0	0	1	1
Questioning A/I Without Sport	<b>8</b>	2	1	0	0	0	2	3
Stripped Identity	<b>10</b>	2	1	1	2	0	3	1
Trepidation About Return to Play	<b>12</b>	1	1	2	4	2	2	0
<b>Limiting Separation</b>	<b>65</b>	<b>4</b>	<b>9</b>	<b>9</b>	<b>6</b>	<b>13</b>	<b>15</b>	<b>9</b>
Being Away from Team	<b>11</b>	1	1	3	1	2	2	1
Missing Games and Practices	<b>11</b>	1	1	3	1	2	2	1
Losing Opportunities to Make Memories	<b>9</b>	1	1	1	1	1	3	1
Importance of Not Being Alone	<b>9</b>	1	2	1	1	1	2	1
Feeling Left Behind by Team	<b>4</b>	0	1	0	1	1	1	0

Separation from AT/PT During COVID	3	0	0	0	1	2	0	0
Relating to People Without Injuries	5	0	1	0	0	1	1	2
Impact of Isolation	6	0	1	1	0	1	2	1
Importance of Socializing	7	0	1	0	0	2	2	2
<b>Loss of Control</b>	<b>62</b>	<b>6</b>	<b>4</b>	<b>8</b>	<b>7</b>	<b>14</b>	<b>9</b>	<b>14</b>
Loss of Normalcy	9	1	1	1	1	1	2	2
Difficult Return to Normalcy	9	0	0	1	1	3	3	1
Recovery Time Out of Control	11	0	1	1	1	3	1	4
Feeling Restrained	12	2	2	2	1	1	1	3
Adjusting to New Normal	8	1	0	1	1	2	1	2
Frustration with Time	8	2	0	1	1	1	1	2
Lack of Equipment	5	0	0	1	1	3	0	0
<b>Vicarious Experiences</b>	<b>73</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>17</b>	<b>13</b>	<b>9</b>	<b>7</b>
Doubt from Others	1	0	0	0	0	0	1	0
Others Doing Rehab Simultaneously	11	1	1	2	3	2	1	1
Fear of Disappointing Others	2	0	0	0	0	1	1	0
Finding Rehab Models	9	1	2	1	3	1	0	1
Seeing Teams Compete Without Them	6	1	2	0	0	1	2	0
Friends with Same Injury	12	1	1	2	3	3	1	1
Seeing Others Progress	13	2	1	3	3	2	1	1
	8	1	1	1	1	2	1	1

Time  
Comparisons with  
Other Athletes

Bonding with Others Over Injury	11	1	1	1	4	1	1	2
<b>Social Support</b>	<b>161</b>	<b>30</b>	<b>14</b>	<b>20</b>	<b>22</b>	<b>33</b>	<b>21</b>	<b>21</b>
Relationships With AT	24	6	2	3	1	6	2	4
Communication with Medical Staff	15	4	1	2	1	2	1	4
Informational Support	26	4	1	6	4	6	2	3
Tangible Support	16	3	1	1	3	3	3	2
Emotional Support	35	5	4	3	6	9	5	3
Support from Coaches	13	1	0	2	3	2	2	3
Fear of Being Overbearing	3	3	0	0	0	0	0	0
Being Held Accountable	11	1	2	1	1	2	3	1
Verbal Persuasion	18	3	3	2	3	3	3	1
<b>Psychological Resources</b>	<b>83</b>	<b>11</b>	<b>11</b>	<b>10</b>	<b>13</b>	<b>11</b>	<b>11</b>	<b>14</b>
Coping Mechanisms	30	5	5	7	2	5	2	4
Mental Health Resources	10	0	0	0	4	1	3	2
Sport Psychologists	3	0	0	0	2	0	1	0
Human-First Approach	14	3	3	1	3	2	1	1
Stress-Related Growth	9	1	1	1	0	1	3	2
Mental Preparation for Rehab	7	1	0	0	1	1	1	3
Resilience	10	1	2	1	1	1	2	2
<b>Totals</b>	<b>695</b>	<b>90</b>	<b>77</b>	<b>89</b>	<b>97</b>	<b>109</b>	<b>123</b>	<b>110</b>

## REFERENCES

- ACL Injuries in Female Athletes. (2020). *Medicine and Science in Sports and Exercise*, 52(8), 1854.
- Ahldén, M., Samuelsson, K., Sernert, N., Forssblad, M., Karlsson, J., & Kartus, J. (2012). The swedish national anterior cruciate ligament register. *The American Journal of Sports Medicine*, 40(10), 2230-2235.
- Alexandre, N. M. C., Nordin, M., Hiebert R., & Campello, M. (2002). Predictors of compliance with short-term treatment among patients with back pain. *Revista Panamericana De Salud Pública*, 12(2), 86-95.
- Andersen, M. B. (2001). Returning to action and the prevention of future injury. In J. Crossman (ed.), *Coping with Sports Injuries: Psychological Strategies for Rehabilitation*. Oxford University Press, pp. 162-173.
- Anderson, M. B. (2007). Collaborative relationship in injury rehabilitation: Two case examples. In D. Pargman (ed.), *Psychological Bases of Sport Injuries*, 3<sup>rd</sup> ed. Fitness Information Technology, pp. 219-236.
- Ardern, C. L., Taylor, N. F., Feller, J. A., & Webster, K. E. (2012). Fear of re-injury in people who have returned to sport following anterior cruciate ligament reconstruction surgery. *Journal of Science and Medicine in Sport*, 15(6), 488-495.
- Ardern C. L., Taylor, N. F., Feller J. A., & Webster K. E. (2014). Fifty-five per cent return to competitive sport following anterior cruciate ligament reconstruction surgery: an updated systematic review and meta-analysis including aspects of physical functioning and contextual factors. *British Journal of Sports Medicine*. 48(21):1543-1552.

- Ardern, C. L., Taylor, N. F., Feller, J. A., Whitehead, T. S., & Webster, K. E. (2013). Psychological responses matter in returning to preinjury level of sport after anterior cruciate ligament reconstruction surgery. *The American Journal of Sports Medicine, 41*(7), 1549-1558.
- Rios, A., D, Perez, F. D., & Rios A. M. (2014). Epidemiology of sports injuries in European Union countries. *Revista Internacional De Medicina Y Ciencias De La Actividad Física Y Del Deporte, 14*(55), 479-494.
- Bandura, A. (1997). Self-Efficacy: The exercise of control. Freeman.
- Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Clinical and Social Psychology, 4*, 263-268.
- Beck, N. A., Lawrence, J. T. R., Nordin, J. D., DeFor, T. A., & Tompkins, M. (2017). ACL tears in school-aged children and adolescents over 20 years. *Pediatrics, 139*(3).
- Bejar, M. P., Fisher, L. A., Nam, B. H., & Larsen, L. K. (2017). High-level South Korean athletes' experiences of injury and rehabilitation. *The Sport Psychologist, 31*, 16-29.
- Bianco, T. (2001). Social support and recovery from sport injury: Elite skiers share their experiences. *Research Quarterly for Exercise and Sport, 72*, 376-388.
- Bianco, T., Malo, S., & Orlick, T. (1999). Sport injury and illness: Elite skiers share their experiences. *Research Quarterly for Exercise and Sport, 70*(2), 157-169.
- Biddle, S. J. H., Hagger, M. S., Chatzisarantis, N. L. D., & Lippke, S. (2007). Theoretical frameworks in exercise psychology. In *Handbook of Sport Psychology*. John Wiley & Sons. pp. 537-559.



- Black, J. M., & Smith, A. L. (2007). An examination of Coakley's perspective on identity, control, and burnout among adolescent athletes. *International Journal of Sport Psychology, 38*, 417–436.
- Brewer, B. W. (1999). Causal attribution dimensions and adjustment to sport injury. *Journal of Personal and Interpersonal Loss, 4*(3), 215-224.
- Brewer, B. W. (2009). Injury prevention and rehabilitation. In B. W. Brewer (Ed.), *Sport Psychology*, Wiley-Blackwell. pp. 83-96
- Brewer, B. W., Andersen, M. B., & Van Raalte, J. L. (2002). Psychological aspects of sport injury rehabilitation: Toward a biopsychosocial approach. In D. I. Mostofsky and L. D. Zaichkowsky (eds.) *Medical Aspects of Sport and Exercise*. Fitness Information Technology, pp. 41-54.
- Brewer, B. W., Cornelius, A. E., Van Raalte, J. L., et al. (2003). Age-related differences in predictors of adherence to rehabilitation after anterior cruciate ligament reconstruction. *Journal of Athletic Training, 38*(2), 158-162.
- Brewer, B. W., Van Raalte, J. L., & Linder, D. E. (1993). Athletic identity: Hercules' muscles or Achilles heel? *International Journal of Sport Psychology, 24*, 237–254.
- Budziszewski, R. (2019). “Get Tough!”: A case study on the development of the sport ethic in youth lacrosse. All graduate plan B and other reports. 1357.
- Carr, A. J. (2001). Measuring quality of life: Is quality of life determined by expectations or experience? *British Medical Journal (Clinical Research Ed.)*, 322(7296), 1240-1243.

- Carson, F. & Polman, R. J. C. (2008). ACL Injury Rehabilitation: A psychological case study of a professional rugby union player. *Journal of Clinical Sport Psychology*, 2, 71-90.
- Chan, D. K. C., Hagger, M. S., & Spray, C. M. (2011) Treatment motivation for rehabilitation after a sport injury: application of the trans-contextual model. *Psychology of Sport and Exercise*, 12(2), 83-92.
- Chan, D. K., Lonsdale, C., Ho, P. Y., Yung, P. S., & Chan, K. M. (2009). Patient motivation and adherence to post-surgery rehabilitation exercise recommendations: The influence of physiotherapists' autonomy-supportive behaviors. *Archives of Physical Medicine and Rehabilitation*, 90(12), 1977-1982.
- Chickering, A. W., & Reisser, L. (1993). *Education and identity*. Jossey-Bass Publishers.
- Christino, M. A., Fantry, A. J., & Vopat, B. G. (2015). Psychological aspects of recovery following anterior cruciate ligament reconstruction. *Journal of American Academy of Orthopedic Surgery*, 23, 501-509.
- Clement, D., Arvinen-Barrow, M., & Fetty, T. (2015). Psychosocial responses during different phases of sport-injury rehabilitation: A Qualitative Study. *Journal of Athletic Training*, 50(1), 95-104.
- Coakley, J., & Donnelly, P. (2009). *Sports in society: Issues and controversies*. McGraw-Hill.
- Coker-Cranney, A., Watson, J. C., II, Bernstein, M., Voelker, D. K., & Coakley, J. (2018). How far is too far? Understanding identity and overconformity in collegiate wrestlers. *Qualitative Research in Sport, Exercise and Health*, 10, 92–116.

- Cormier, M. L., & Zizzi, S. J. (2015). Athletic trainers' skills in identifying and managing athletes experiencing psychological distress. *Journal of Athletic Training, 50*(12), 1267-1276.
- Crossman, J. (2001). *Coping with sports injuries: Psychological strategies for rehabilitation*. Oxford University Press.
- Culvenor, A. G., & Barton, C. J. (2018). ACL injuries: The secret probably lies in optimising rehabilitation. *British Journal of Sports Medicine, 52*(22), 1416-1418.
- Dahab, K., Potter, M. N., Provance, A., Albright, J., & Howell, D. R. (2019). Sport specialization, club sport participation, quality of life, and injury history among high school athletes. *Journal of Athletic Training, 54*(10), 1061-1066.
- Day, C. (2011). Availability and utilization of sport psychology services for injured college athletes. PhD Dissertation. Antioch University.
- DeCarlo, M. S., Sell, D. E., Shelbourne K. D., & Klootwyk, T. E. (1994). Current concepts on accelerated ACL rehabilitation. *Journal of Sport Rehabilitation, 3*, 304–318.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268.
- Dodwell, E. R., LaMont, L. E., Green, D. W., Pan, T. J., Marx, R. G., & Lyman, S. (2014). 20 years of pediatric anterior cruciate ligament reconstruction in New York State. *The American Journal of Sports Medicine, 42*(3), 675-680.
- Donskov, A. S., Humphreys, D., & Dickey, J. P. (2019). What is injury in ice hockey: An integrative literature review on injury rates, injury definition, and athlete exposure in men's elite ice hockey. *Sports (Basel), 7*(11), 227.

- Driediger, M., Hall, C., & Callow, N. (2006). Imagery use by injured athletes: A qualitative analysis. *Journal of Sports Sciences, 24*(3), 261-272.
- Edouard, P., Cugy, E., Dolin, R., Morel, N., Serra, J. M., Depiesse, F., Steffen, K. (2020). The athletics injury prevention programme can help to reduce the occurrence at short term of participation restriction injury complaints in athletics: A prospective cohort study. *Sports (Basel), 8*(6), 84.
- Egan, K. P., & Freeman, J. (2020). Psychological adjustment to athletic injury. In *DeLee, Drez, & Miller's Orthopaedic Sports Medicine*, Fifth ed., pp. 272-276.
- Evans, L., & Hardy, L. (2002). Injury rehabilitation: A goal-setting intervention study. *Research Quarterly for Exercise and Sport, 73*(3), 310-319.
- Evans, L., Hardy, L., & Fleming, S. (2000). Intervention strategies with injured athletes: An action research study. *The Sport Psychologist, 14*(2), 188-206.
- Feltz, D. L., Short, S. E., & Sullivan, P. J. (2008). *Self-Efficacy in Sport*. Human Kinetics.
- Filbay, S. R., Crossley, K. M., & Ackerman, I. N. (2016). Activity preferences, lifestyle modifications and re-injury fears influence longer-term quality of life in people with knee symptoms following anterior cruciate ligament reconstruction: A qualitative study. *Journal of Physiotherapy, 62*(2), 103-110.
- Forsdyke, D., Smith, A., Jones, M., & Gledhill, A. (2016). Psychosocial factors associated with outcomes of sports injury rehabilitation in competitive athletes: A mixed studies systematic review. *British Journal of Sports Medicine, 50*(9), 537-544.
- Frih, Z. B. S., Fendri, Y., Jellad, A., Boudoukhane, S., & Rejeb, N. (2009). Efficacy and treatment compliance of a home-based rehabilitation programme for chronic low

- back pain: A randomized, controlled study. *Annals of Physical and Rehabilitation Medicine*, 52(6), 485-496.
- Gallagher, R. (2005). National survey of counseling center directors. *The International Association of Counseling Services*, 80, 1-57.
- Giannone, Z. A., Haney, C. J., Kealy, D., & Ogrodniczuk, J. S. (2017). Athletic identity and psychiatric symptoms following retirement from varsity sports. *International Journal of Social Psychiatry*, 63(7), 598-601.
- Giugliano, D. N., & Solomon, J. L. (2007). ACL tears in female athletes. *Physical Medicine and Rehabilitation Clinics of North America*, 18(3), 417-438.
- Gould, D., Udry, E., Bridges, D., & Beck, L. (1997). Stress sources encountered when rehabilitating from season-ending ski injuries. *The Sport Psychologist*, 11(4), 361-378.
- Granito, V. J. (2002). Psychological response to athletic injury: Gender differences. *Journal of Sport Behavior*, 25(3), 243-259.
- Green, S. L., & Weinberg, R. S. (2001). Relationships among athletic identity, coping skills, social support, and the psychological impact of injury in recreational participants. *Journal of Applied Sport Psychology*, 13(1), 40-59.
- Guest, G., MacQueen, K. M. and Namey, E. E. (2012). Applied thematic analysis. Sage.
- Gustafsson, H., Hassmén, P., Kenttä, G., & Johansson, M. (2008). A qualitative analysis of burnout in elite Swedish athletes. *Psychology of Sport and Exercise*, 9(6), 800-816.
- Hagger M. S., & Chatzisarantis, N. (2008). Self-determination theory and the psychology of exercise. *International Review of Sport and Exercise Psychology*, 1, 79-103.

- Hagger, M. S., Chatzisarantis, N. L. D., & Biddle, S. J. H. (2002). The influence of autonomous and controlling motives on physical activity intentions within the theory of planned behaviour. *British Journal of Health Psychology*, 7(3), 283-297.
- Hardin, R., & Pete, J. R. (2013). Playbook vs. textbook: Examining academic transitioning of NCAA division I-FBS football student athletes. *Journal for the Study of Sports and Athletes in Education*, 7(3), 229-244.
- Heaney, C. A., Rostron, C. L., Walker, N. C., & Green, A. J. K. (2016). Is there a link between previous exposure to sport injury psychology education and UK sport injury rehabilitation professionals' attitudes and behaviour towards sport psychology? *Physical Therapy in Sport*, 23, 99-104.
- Heaney, C., Green A. J. K., Rostron, C. L., & Walker, N. (2012). A qualitative and quantitative investigation of the psychology content of UK physiotherapy education programs. *Journal of Physical Therapy Education*, 26(3), 24-56.
- Heijne, A., Axelsson, K., Werner, S., & Biguet, G. (2008). Rehabilitation and recovery after anterior cruciate ligament reconstruction: Patients' experiences. *Scandinavian Journal of Medicine & Science in Sports*, 18(3), 325-335.
- Hootman, J. M., Dick, R., & Agel, J. (2007). Epidemiology of collegiate injuries for 15 sports: Summary and recommendations for injury prevention initiatives. *Journal of Athletic Training*, 42(2), 311-319.
- Hughes, R., & Coakley, J. (1991). Positive deviance among athletes: The implications of overconformity to the sport ethic. *Sociology of Sport Journal*, 8, 307-325.


- Hurtubise, J. M., Beech, C., & Macpherson, A. (2015). Comparing severe injuries by sex and sport in collegiate-level athletes: A descriptive epidemiologic study. *International Journal of Athletic Therapy and Training*, 20, 44–50.
- Institute of Medicine, Department of Emergency Cardiovascular Medicine. (2007). Determinants of self-efficacy in the rehabilitation of patients with anterior cruciate ligament injury. *Journal of Rehabilitation Medicine*, 39(6), 486-492.
- Institute of Medicine, Department of Emergency Cardiovascular Medicine. (2007). Self-efficacy, symptoms and physical activity in patients with an anterior cruciate ligament injury: A prospective study. *Scandinavian Journal of Medicine & Science in Sports*, 17(3), 238-245.
- Ivarsson, A., Johnson, U., Andersen, M. B., Tranaeus, U., Stenling, A., & Lindwall, M. (2017). Psychosocial factors and sport injuries. *Sports Medicine*, 47(2), 353.
- Jackson, D. (2010). How personal trainers can use self-efficacy theory to enhance exercise behavior in beginning exercisers. *Strength and Conditioning Journal*, 32(3), 67-71.
- Jerre, R., Ejerhed, L., Wallmon, A., Kartus, J., Brandsson, S., & Karlsson, J. (2001). Functional outcome of anterior cruciate ligament reconstruction in recreational and competitive athletes. *Scandinavian Journal of Medicine & Science in Sports*, 11(6), 342-346.
- Jesus, T. S., Bright, F., Kayes, N., & Cott, C. A. (2016). Person-centered rehabilitation: What exactly does it mean? Protocol for a scoping review with thematic analysis towards framing the concept and practice of person-centered rehabilitation. *BMJ Open*, 6(7), 1-8.

- Johnson, U. (1997). A three-year follow-up of long-term injured competitive athletes: Influence of psychological risk factors on rehabilitation. *Journal of Sport Rehabilitation, 6*(3), 256-271.
- Johnston, L. H., & Carroll, D. (1998). The context of emotional responses to athletic injury: A qualitative analysis. *Journal of Sport Rehabilitation, 7*(3), 206-220.
- Kahn, J. S., Wood, A., & Wiesen, F. E. (1999). Student perceptions of college counseling center services: Programming and marketing for a seamless learning environment. *Journal of College Student Psychotherapy, 14*, 69-80.
- Kebede, A. & Rao, R. R. (2013). The psychological aspects of injury in sport. *International Journal of Social Sciences and Interdisciplinary Research, 2*, 2.
- Kerr, Z. Y., Marshall, S. W., Dompier, T. P., Corlette, J., Klossner, D. A., & Gilchrist, J. (2015). College Sports–Related Injuries — United States, 2009–10 Through 2013–14 Academic Years. *MMWR. Morbidity and Mortality Weekly Report, 64*(48), 1330-1336.
- Lally, P. S., & Kerr, G. A. (2005). The career planning, athletic identity, and student role identity of intercollegiate student athletes. *Research Quarterly for Exercise and Sport, 76*, 275-285.
- Latha, D. P. P., & Sharmila, D. J. S. (2010). QSAR study for the prediction of half maximal inhibitory concentration of compounds structurally similar to glycerol. *Turkish Journal of Biochemistry, 35*, 289-292.
- Levinger, P., Karen, H., Fraser, D., Pile, R., Clare, A., Moreira, B., & Talbot, S. (2017). A novel web-support intervention to promote recovery following anterior cruciate



- ligament reconstruction: A pilot randomised controlled trial. *Physical Therapy in Sport*, 27, 29-37.
- Lisee, C. M., DiSanti, J. S., Chan, M., Ling, J., Erickson, K., Shingles, M., & Kuenze, C. M. (2020). Gender differences in psychological responses to recovery after anterior cruciate ligament reconstruction before return to sport. *Journal of Athletic Training*, 55(10), 1098-1105.
- Maddison, R., Prapavessis, H., & Clatworthy, M. (2006). Modeling and rehabilitation following anterior cruciate ligament reconstruction. *Annals of Behavioral Medicine*, 31(1), 89-98.
- Maddison R., Prapavessis H., Clatworthy M., Hall C., Foley L., Harper T., Cupal D., & Brewer B. (2011). Guided imagery to improve functional outcomes post-anterior cruciate ligament repair: randomized-controlled pilot trial. *Scandinavian Journal of Medicine and Science in Sports*, 22(6), 816-821.
- Madrigal, L., Gill, D. L. (2014). Psychological responses of division I female athletes throughout injury recovery: A case study approach. *Journal of Clinical Sport Psychology*, 8(3), 276-298.
- Maffulli, N., Longo, U. G., Gougoulias, N., Loppini, M., & Denaro, V. (2010). Long-term health outcomes of youth sports injuries. *British Journal of Sports Medicine*, 44(1), 21-25.
- Mainwaring, L. M, Hutchison, M., Bisschop, S. M., Comper, P., & Richards, D. W. (2010). Emotional response to sport concussion compared to ACL injury. *Brain Injury*, 24(4), 589-597.

- Malinauskas, R. (2008). College athletes' perceptions of social support provided by their coach before injury and after it. *Journal of Sports Medicine and Physical Fitness*, 48(1), 107-112.
- Mall, N. A., Chalmers, P. N., Moric, M., Tanaka, M. J., Cole, B. J., Bach, B. R., & Paletta, G. A. (2014). Incidence and trends of anterior cruciate ligament reconstruction in the united states. *The American Journal of Sports Medicine*, 42(10), 2363-2370.
- Martin, E. M., & Horn, T. S. (2013). The role of athletic identity and passion in predicting burnout in adolescent female athletes. *The Sport Psychologist*, 27, 338–348.
- McArdle S. (2010). Psychological rehabilitation from anterior cruciate ligament-medial collateral ligament reconstructive surgery: a case study. *Sports health*, 2(1), 73–77.
- McCullagh, P., & Weiss M. R. (2002). Observational learning: The forgotten psychological method in sport psychology. In Van Raalte JL, Brewer BW (eds), *Exploring Sport and Exercise Psychology*, American Psychological Association, 131–149.
- McCullagh, P., & Weiss, M. R. (2001). Modeling: Considerations for motor skill performance and psychological responses. In Singer RN, Hausenblas H.A., Janelle C. M. (eds), *Handbook of Sport Psychology*, Wiley, 205–238.
- McDonald, S. A., & Hardy, C. J. (1990). Affective response patterns of the injured athlete: An exploratory analysis. *The Sport Psychologist*, 4(3), 261–274.

- Mendonza, M., Patel, H., & Bassett, S. (2007). Influences of psychological factors and rehabilitation adherence on the outcome post anterior cruciate ligament injury/surgical reconstruction. *New Zealand Journal of Physiotherapy, 35*(2), 62-71.
- Naoi, A., & Ostrow, A. (2008). The effects of cognitive and relaxation interventions on injured athletes' mood and pain during rehabilitation. *Athletic Insight: The Online Journal of Sport Psychology, 10*(1).
- Naqvi, A. A., Hassali, M. A., Naqvi, S. B. S., Shakeel, S., Zia, M., Fatima, M., & Nadir, M. N. (2020). Development and validation of the general rehabilitation adherence scale (GRAS) in patients attending physical therapy clinics for musculoskeletal disorders. *BMC Musculoskeletal Disorders, 21*(1), 65-11.
- National Collegiate Athletic Association. Sports sponsorship and participation rates. Indianapolis, IN: National Collegiate Athletic Association; 2014. Available at <http://www.ncaa.org/about/resources/research/sports-sponsorship-and-participation-research>
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis. *International Journal of Qualitative Methods, 16*(1), 1-13.
- Nyland, J., Johnson, D. L., Caborn, D. N. M., & Brindle, T. (2002). Internal health status belief and lower perceived functional deficit are related among anterior cruciate ligament-deficient patients. *Arthroscopy, 18*(5), 515-518.
- O'Halloran, C. M., & Altmaier, E. M. (1995). The efficacy of preparation for surgery and invasive medical procedures. *Patient Education and Counseling, 25*, 9-16.

- Olmedilla, A., Rubio, V. J., Fuster-Parra, P., Pujals, C., & García-Mas, A. (2018). A Bayesian approach to sport injuries likelihood: Does player's self-efficacy and environmental factors plays the main role? *Frontiers in Psychology, 9*, 1174.
- Padegimas, E. M., Stepan, J. G., Stoker, G. E., Polites, G. M., & Brophy, R. H. (2016). Epidemiology and severity of sports and recreation injuries presenting to a tertiary adult emergency department. *The Physician and Sports Medicine, 44*(3), 263–268.
- Paterno, M. V., Schmitt, L. C., Thomas, S., Duke, N., Russo, R., & Quatman-Yates, C. C. (2019). Patient and parent perceptions of rehabilitation factors that influence outcomes after anterior cruciate ligament reconstruction and clearance to return to sport in adolescents and young adults. *The Journal of Orthopaedic and Sports Physical Therapy, 49*(8), 576-583.
- Pizzari, T., McBurney, H., Taylor, N. F, & Feller, J. A. (2002). Adherence to anterior cruciate ligament rehabilitation: A qualitative analysis. *Journal of Sport Rehabilitation, 11*(2), 90-102.
- Podlog, L., Banham, S. M., Wadey, R., & Hannon, J. C. (2015). Psychological readiness to return to competitive sport following injury: A qualitative study. *The Sport Psychologist, 29*, 1-14.
- Podlog, L. & Dionigi, R. (2010). Coping strategies for addressing psychological challenges during return to sport for injury. *Journal of Sport Sciences, 28*, 1197-1208.
- Podlog, L., & Eklund, R. C. (2004). Assisting injured athletes with the return to sport transition. *Clinical Journal of Sport Medicine, 14*(5), 257-259.

- Podlog, L., & Eklund, R. C. (2005). Return to sport after serious injury: A retrospective examination of motivation and psychological outcomes. *Journal of Sport Rehabilitation, 14*(1), 20-34.
- Podlog, L., & Eklund, R. C. (2007). The psychosocial aspects of a return to sport following serious injury: A review of the literature from a self-determination perspective. *Psychology of Sport and Exercise, 8*(4), 535-566.
- Podlog, L., & Eklund, R. C. (2010). Returning to competition after a serious injury: The role of self-determination. *Journal of Sports Sciences, 28*(8), 819-831.
- Rahr-Wagner, L., Thillemann, T. M., Pedersen, A. B., & Lind, M. (2014). Comparison of hamstring tendon and patellar tendon grafts in anterior cruciate ligament reconstruction in a nationwide population-based cohort study. *The American Journal of Sports Medicine, 42*(2), 278-284.
- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily wellbeing: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin, 26*(4), 419–435.
- Rosenfeld, L. B., & Richman, J. M. (1997). Developing effective social support: Team building and the social support process. *Journal of Applied Sport Psychology, 9*, 133-153.
- Roy, J., Mokhtar, A. H., Karim, S. A., & Mohanan, S. A. (2015). Cognitive appraisals and lived experiences during injury rehabilitation: A narrative account within personal and situational backdrop. *Asian Journal of Sports Medicine, 6*(3).

- Ryan, R. M., & Deci, E.L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American Psychologist*, 55(1), 68-78.
- Salim, J., & Wadey, R. (2019). Using gratitude to promote sport injury-related growth. *Journal of Applied Sport Psychology*, 33, 131-150.
- Salim, J., Wadey, R., & Diss, C. (2016). Examining hardiness, coping, and stress-related growth following sport injury. *Journal of Applied Sport Psychology*, 28(2), 154-169.
- Sarason, I. G., Sarason, B. R., & Pierce, G. R. (1990). Social support: The search for theory. *Journal of Social Clinical Psychology*, 9, 133-147.
- Saville, P. D., & Bray, S. R. (2016). Athletes' perceptions of coaching behavior, relation-inferred self-efficacy (RISE), and self-efficacy in youth sport. *Journal of Applied Sport Psychology*, 28(1), 1-13.
- Sims, M., & Mulcahey, M. K. (2018). Sex-specific differences in psychological response to injury and return to sport following ACL reconstruction. *Journal of Bone and Joint Surgery*, 6(7), e9.
- Soto, W. (2019). Athletic identity and ego identity status as predictors of psychological health among intercollegiate athletes. Ph.D. dissertation, Ohio University.
- Sugarman, J., & Sokol, B. (2012). Human agency and development: An introduction and theoretical sketch [Editorial]. *New Ideas in Psychology*, 30(1), 1-14.
- Sweet, S. N., Fortier, M. S., Strachan, S. M., & Blanchard, C. M. (2012). Testing and integrating self-determination theory and self-efficacy theory in a physical activity context. *Canadian Psychology*, 53(4), 319-327.

- Thomeé, P., Wahrborg, P., Borjesson, M., Thomee, R., Eriksson, B. I., & Karlsson, J. (2006). A new instrument for measuring self-efficacy in patients with an anterior cruciate ligament injury. *Scandinavian Journal of Medicine & Science in Sports, 16*(3), 181-187.
- Tracey, J. (2003). The Emotional Response to the Injury and Rehabilitation Process. *Journal of Applied Sport Psychology, 15*(4), 279-293.
- Tripp, D. A., Stanish, W. D., Coady, C., & Reardon, G. (2004). The subjective pain experience of athletes following anterior cruciate ligament surgery. *Psychology of Sport and Exercise, 5*(3), 339-354.
- Tripp, D. A., Stanish, W., Ebel-Lam, A., Brewer, B. W., & Birchard, J. (2007). Fear of reinjury, negative affect, and catastrophizing predicting return to sport in recreational athletes with anterior cruciate ligament injuries at 1-year post-surgery. *Rehabilitation Psychology, 52*(1), 74-81.
- Unruh, S., Unruh, N., Moorman, M., & Seshadri, S. (2005). Collegiate student-athletes' satisfaction with athletic trainers. *Journal of Athletic Training, 40*(1), 52-55.
- Uzawa, H., & Davis, S. (2018). Outcome measures for adherence to home exercises among patients with chronic low back pain: A systematic review. *Journal of Physical Therapy Science, 30*(4), 649-653.
- Van Eck, C. F., Schkrohowsky, J. G., Working, Z. M., Irrgang, J. J., & Fu, F. H. (2012). Prospective analysis of failure rate and predictors of failure after anatomic anterior cruciate ligament reconstruction with allograft. *The American Journal of Sports Medicine, 40*(4), 800-807.

- Vergeer, I. (2006). Exploring the mental representation of athletic injury: A longitudinal case study. *Psychology of Sport and Exercise, 7*(1), 99-114.
- Vitale, F. (2011). Recupero e prevenzione dell'infortunio sportivo: una ricerca sul contributo della pratica mentale (imagery). *Giornale Italiano di Psicologia dello Sport, 10*, pp.42-47.
- Von Rosen, P., Kottorp, A., Friden, C., Frohm, A., & Heijne, A. (2018). Young, talented, and injured: Injury perceptions, experiences, and consequences in adolescent elite athletes. *European Journal of Sport Science, 18*(5), 731.
- Wadey, R., Evans, L., Evans, K., & Mitchell, I. (2011). Perceived benefits following sport injury: A qualitative examination of their antecedents and underlying mechanisms. *Journal of Applied Sport Psychology, 23*(2), 142-158.
- Warner, S., & Dixon, M. A. (2011). Understanding sense of community from the athlete's perspective. *Journal of Sport Management, 25*(3), 257-271.
- Webster, K. E., Feller, J. A., & Lambros, C. (2008). Development and preliminary validation of a scale to measure the psychological impact of returning to sport following anterior cruciate ligament reconstruction surgery. *Physical Therapy in Sport, 9*(1), 9-15.
- White, K., Di Stasi, S. L., Smith, A. H., & Snyder-Mackler, L. (2013). Anterior cruciate ligament-specialized post-operative return-to-sports (ACL-SPORTS) training: A randomized control trial. *BMC Musculoskeletal Disorders, 14*(1), 108.



- Whyte, J., Dijkers, M. P., Hart, T., Van Stan, J. H., Packel, A., Turkstra, L. S., & Ferraro, M. (2019). The importance of voluntary behavior in rehabilitation treatment and outcomes. *Archives of Physical Medicine and Rehabilitation, 100*(1), 156-163.
- Wiese-Bjornstal, D. M., Smith, A. M., Shaffer, S. M., & Morrey, M. A. (1998). An integrated model of response to sport injury: Psychological and sociological dynamics. *Journal of Applied Sport Psychology, 10*(1), 46-69.
- Woodruff, A. L., & Schallert, D. L. (2008). Studying to play, playing to study: Nine college student-athletes' motivational sense of self. *Contemporary Educational Psychology, 33*(1), 34-57.
- Yorgason, J. B., Linville, D., & Zitzman, B. (2008). Mental health among college students: Do those who need services know about and use them? *Journal of American College Help, 57*(2), 173-181.

VITA

Myles T. Englis

---

Education

- Aug. 2021- Florida State University, Tallahassee, Florida  
*Doctor of Philosophy, College of Education*  
Specialization: *Sport and Performance Psychology*
- Aug. 2019-May 2021 University of Kentucky, Lexington, Kentucky  
*Master of Science in Kinesiology and Health Promotion*  
Specialization: *Sport and Exercise Psychology*  
Thesis: Helping the Have Nots: Examining the Relationship  
Between Rehabilitation Adherence and Self-Efficacy  
Beliefs in Injured NAIA and NCAA DII and DIII Female  
Athletes  
Faculty Advisor: Dr. Marc Cormier
- Aug. 2012-Dec. 2016 Creighton University, Omaha, Nebraska  
*Bachelor of Business Administration*  
Majors: *Marketing and Entrepreneurship*

---

**Manuscripts Under Review/In Progress**

---

- Tierney, T., Curvey, R. M. G., Scheadler, T., Murphy, E., White, S., & **Englis, M. T.** (manuscript writing). Examining mental health and performance enhancement integration in sport psychology.
- Curvey, R. M. G., Murphy, E., Scheadler, T., White, S., **Englis, M. T.**, & Phelps, L. L. (submitted to AASP). Multicultural training and awareness of sport psychology practitioners.
- Scheidler, T., **Englis, M. T.**, & Cormier, M. L. (data collection phase). Severe traumatic brain injury and athletic identity: A case study. To be submitted to *Disability and Rehabilitation*.
- Murphy, E. A., Curvey, R. M. G., Scheadler, T. R., White, S. C., **Englis, M. T.**, & Phelps, L. L. (2021, August). Sport psychology practitioner's perceptions of athlete activism [Poster to be presented]. American Psychological Association Annual Convention, San Diego, CA.

---

**Work Experience**

---

Aug 2019-May 2021	University of Kentucky Residence Life, Lexington, KY <b>Wildcat Coal Lodge Assistant Resident Director</b>
Jan. 2017-July 2019	Philadelphia Fury Soccer Club, Philadelphia, PA <b>Professional Soccer Player</b>
Jan. 2017-July 2019	Youth Soccer Coach, Philadelphia, PA <b>Individual and Team Trainer</b>
May-July 2013-2015	Youth Soccer Coach, Bradenton, FL <b>IMG Academy Professional Development Team and Youth Soccer Coach</b>
July 2012-Dec. 2016	Creighton University Men's Soccer Team, Omaha, NE <b>Division I Collegiate Athlete</b>

---

**Honors**

---

2020-2021	University of Kentucky Residence Life Graduate Student of the Year
2017-2018	American Soccer League (NISA) Golden Boot Most Goals Scored <i>American Soccer League</i>
2015-2016	Big East Conference All-Tournament Team <i>Big East Conference</i>
2013-2016	Big East Conference All-Academic Team <i>Big East Conference</i>
2012	Missouri Valley Conference All-Academic Team <i>Missouri Valley Conference</i>