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Claremont McKenna College

The Effects of Retirement on Division III Collegiate Athletes' Mental Health

submitted to

Professor Daniel Krauss

by

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for

Senior Thesis

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**Abstract**

Following their participation in athletics after their collegiate retirement, this research examines whether there is a relationship between college athletes' mental health and their athletic identity. Specifically, it examines whether athletic retirement leads to anxiety and depression. Participants will be asked to answer a survey that relates to their athletic identity, and the occurrence of symptoms related to depression and anxiety at different periods of their collegiate career and after their athletic retirement. Results are predicted to demonstrate a significant relationship between retired athletes' level of athletic identity and the prevalence of depression and anxiety following cessation of athletics. However, this effect is likely to be moderated by their participation in athletic endeavors post-graduation. Future research should explore athletes' identity and their mental health throughout their careers and after retirement.

*Keywords:* mental health, athletic identity, depression, anxiety, student athletes, loss of identity

## **The Effects of Retirement on Division III Collegiate Athletes' Mental Health**

### **Introduction**

#### **Time Devoted by Athletes to Their Sport (Division III)**

Division III student-athletes dedicate a significant part of their lives to their training. For years, these athletes surround themselves with coaches, teammates, and trainers who share similar interests. They endure countless hours of training sessions and sacrifice substantial time that prevents them from expanding their social circles. The NCAA reports that Division III students-athletes allocate on average 30.3 hours per week to athletics and 39.1 hours to academics (NCAA, June 2017). This translates to a combined average of about 10 hours a day dedicated to training and studying, seven days a week. These significant numbers of hours demonstrate how much student-athletes dedicate to fulfilling their dual roles (Rodriguez, 2020). This taxing schedule is similar to having two full-time jobs. Furthermore, the physical and mental demands of this pursuit are seldom limited to a team's athletic season and extend into the off-season months (NCAA, 2017). Student-athletes maintain intense schedules year-round and push their bodies for a long period of time. A considerable part of college athletes' energy is often concentrated and focussed toward one goal: working toward improving their performance in their respective sport. It is important for these athletes to be able to perform when it matters most. Performance remains a major focal point for many college athletes.

#### **Benefits of Athletic Engagement on Mental Health**

Participation in athletics provides benefits to many individuals' mental health. Snyder et al., (2010) concluded that athletes have better outcomes on a number of subscales that relate to overall well-being than nonathletes. Using the Medical Outcomes Short Form (SF-36) and the Pediatric Outcomes Data Collection Instrument (PODCI), the researchers surveyed 219 high

school athletes and 106 non-athletes. The research assessed the young participants' perception of their overall well-being and functionality through a series of questions that referred to physical, mental, and emotional health. The authors found that those who enrolled in sports from an early age showed stronger signs of social, mental, and overall health than those who did not participate in athletics (see Figure 1 and 2 for scales). Physically active individuals reported higher scores on happiness and overall emotional measurements as well (Snyder et al., 2010).

Physical activity reduces anxiety and depression (Craft & Perna, 2004). Exercise through increased blood flow to the brain has a positive effect on different centers that regulate physiologic responses to stress (Craft & Perna, 2004). The stimulation of the limbic system through exercise also helps modulate athletes' motivation and mood, and regulates their response to physical or emotional obstacles (Sharma et al., 2006). When individuals exercise, the amount of endorphins secreted by the pituitary gland increases throughout the brain and nervous system (Craft & Perna, 2004). This has a positive influence on general mood and overall wellness, helping to decrease the perception of pain and levels of depression and anxiety (Craft & Perna, 2004). The stimulation of the different areas of the brain by "happy" hormones can help to modulate mood, increase motivation, and lessen the response to stress (Sharma et al., 2006).

Beside providing physiological benefits, participation in collegiate athletics offers a social environment that can promote self-esteem and limit social withdrawal. By interviewing six first generation female college student-athletes about how they balanced their academic and athletic schedules, Rodriguez (2020) demonstrated that collegiate female athletes learned self-discipline, commitment, and how to overcome hardships through their participation in sports. Female athletes also qualitatively highlighted that lessons learned through sports helped



them to persist in their academic career and to face challenges later in different aspects of life (Rodriguez, 2020).

### **Sports Retirement**

When individuals' collegiate athletic careers conclude, the changes in their lifestyle can cause adjustment difficulties. Unlike adults retiring from work, younger adults may not be well prepared for the transition into a new life (Smith and McManus, 2008). Hattersley et al., (2019) suggest that this early transition into retirement elicits adjustments at psychological, social, and occupational levels (Hattersley et al., 2019). A sense of loss may emerge as the retired college athletes no longer benefit from the structure offered by their school, sports commitment, or their coaches. These challenging changes can impact the individual's mental health, and affect athletes' mental disposition. Specific changes may include: 1) the disappearance of a personal athletic goal or of a team's common goal; and/or 2) separation from an athletic family or changes in social networks. Additionally, a new diet, a modified sleeping pattern, and a different training routine can all affect a person's mental health upon their athletic retirement.

The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition: DSM-5 (2013) defines depression as a mental illness in which individuals must experience "five or more symptoms during the same 2-week period and at least one of the symptoms should either be (1) depressed mood or (2) loss of interest or pleasure." The full list of criteria for depression is as follows:

- (1) depressed mood most of the day, nearly every day;
- (2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day;
- (3) significant weight loss when not dieting or weight gain, or decrease or increase in appetite nearly every day;
- (4) a slowing down of thought and a

reduction of physical movement (observed by others, not merely subjective feelings of restlessness or being slowed down); (5) fatigue or loss of energy nearly every day; (6) feelings of worthlessness or excessive or inappropriate guilt nearly every day; (7) diminished ability to think or concentrate, or indecisiveness, nearly every day; (8) recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide. (American Psychiatric Association, 2013)

The criteria for a major depressive episode also require that symptoms severely impair an individual's daily life, and that symptoms may not be the result of drugs or alcohol (American Psychiatric Association, 2013). The DSM-5 defines anxiety disorders in general as illnesses that present a combination of symptoms that include "excessive anxiety and worry about a variety of topics, events, or activities" (American Psychiatric Association, 2013). The American Psychiatric Association (APA) additionally states that anxiety and worry differ from occasional nervousness. Symptoms of anxiety include muscle tension and withdrawal from certain situations. According to the APA, anxiety disorders are the most common category of mental disorders. They affect up to thirty percent of the adult population each year (American Psychiatric Association, 2017). The presence of symptoms of anxiety, or of those of depression, similarly interfere with an individual's daily life.

A limited amount of research has been conducted on how retirement affects collegiate athletes' mental health. Most of the research examining the general health and mental health of retired athletes has used retired professional athletes, and in particular retired football players (Kerr et al., 2014). Due to the specific nature of this sport, and the high level of career-ending injuries sustained by football players, it remains difficult to generalize whether the overall health

and well-being of professional athletes will be similar to those of retired student-athletes. There are currently more than 499,000 student-athletes participating in 24 different sports across 3 divisions at the collegial level (NCAA, 2020). According to the NCAA, fewer than 2 percent of these athletes will continue to play sports at a professional level when they leave college (NCAA, 2020). The likelihood of continuing an athletic career after college is even smaller for athletes who compete at the Division III level. Examining mental health could help these student-athletes experience a smoother transition into a post-athletic career lifestyle.

### **Athletic Identity**

According to Giannone et al. (2017), few athletes focus on developing a well-rounded version of themselves in all aspects of life. Individuals who exclusively define themselves as athletes without developing interests or connections outside of their athletic world have a harder time adjusting psychologically once sports are no longer a part of their life. Setting goals toward personal growth, developing one's career, or creating social connections outside of sports appears important. The researchers suggest that addressing an individual's athletic identity while they are still active in their sport could help prevent depression and anxiety once they have retired (Giannone et. al, 2017). By demystifying the mental challenges individuals face, retired collegiate athletes may recognize their problems and be more willing to receive help.

A significant problem retired student-athletes confront is filling the time they now have available to them. The greater the athletic role has in their life, the more attached they are to the sport, the harder it may be for these athletes to adapt to new aspects of life. Michael Phelp's movie, *The Weight of Gold*, paints a general picture of the time high-level athletes dedicate to sports. According to the documentary, "athletes are more susceptible to depression because they have a great ability to hyperfocus. They are focused on being the best at one thing with no other

balance, [and wonder] [...] what [they would] do with [their] energy" when their athletic career ends (Rapkin, 2020). This idea of hyperfocus does not permit the athlete to attend to other aspects of their life. Although this quote is from a movie that depicts Olympians' struggle with mental health, it is fair to assume that the same situation may apply to retired Division III student-athletes. In both cases, athletes have pursued their goals for many years. This focused tunnel vision may occur no matter what level of athletic ability.

The physical abilities of high school athletes who move on to participate at the collegiate level are often greater than the abilities of high school athletes who do not choose to continue to participate in athletics. Consequently, many individuals with greater physical abilities decide to pursue athletics beyond high school. Interestingly, the National Collegiate Athletic Association (NCAA) stated that previous "studies have shown that participation in sport at the high school level and before acts as a protective factor that leads to more pro-social behavior" while athletes that participate in college sports are at "increased risk for issues related to [...] negative behaviors" (Chew & Thompson, 2017, p. 1). The authors suggest this discrepancy in outcome is due to additional stressors college athletes face, including: 1) more challenging academics, 2) greater exposure to drugs and alcohol, 3) pressure to perform athletically, and 4) learning to live independently. When boredom or lack of motivation present themselves as an obstacle, athletes have a high potential of overcoming challenges and continuing to persevere. Athletes are also trained to endure pain and are, therefore, good at ignoring it. Experiencing a significant level of discomfort is part of most sports, especially for higher level athletics. Some athletes even believe they have to feel pain to receive a reward. These individuals are used to fighting through the pain without questioning whether it is good for them; pain is normalized. It is a part of the athlete's persona to "just do it".

With such a mentality instilled from a young age, Division III student-athletes normalize mental pain, and may be less likely to reach out for help by letting people know they are feeling mentally unwell. This harmful stigma leads student athletes to fear they will be seen as vulnerable. The NCAA also found that student athletes “use mental health services at a much lower rate than non-athletes” (Chew & Thompson, 2017, p. 1). Acknowledging and accepting mental health is still something new among collegiate athletes. Interviewing Claremont-Mudd-Scripps swim team members revealed dissatisfaction toward the resources available to athletes' mental health when compared to their physical health. These athletes expressed not having sufficient time to address their mental health needs while simultaneously working toward their degrees and training for their sport. They agreed that mental illness is overshadowed by physical ailments associated with sports and training. Problems that are not visible may be more easily ignored. They suggested that having a dedicated sports psychologist associated with the school's athletic department would be a good first step in helping student-athletes (S. Lewis & W. Limm, personal interviews, November 18, 2020). Having a sports psychologist on the coaching staff would benefit athletes who are interested in working on the mental aspect of their sport and could create opportunities for student-athletes who hesitate to reach out for help.

College athletes have access to medical treatment during and after practices as well as during meets, games, and competitions. Their physical needs are readily met by professionals. If an athlete sprains their ankle, the athlete can easily explain to their coach their physical pain. Explaining mental disorders is more difficult. Many coaches are not well versed in different mental illnesses, not even the specifics of depression and anxiety. This makes it problematic for individuals to reveal issues and seek help during their college years, and even harder once they

have retired from their sport. Athletes' mentality often dictates that they should push through the pain and that they cannot reveal weaknesses. College campuses are slowly taking steps in the right direction and are now advocating for student athletes' mental health (Valentine & Taub, 1999).

### **Athletic Identity and Its Effects on Post-Retirement Mental Health**

A person's athletic identity, which involves how an individual perceives and defines themselves, can also influence the nature of their mental health. Menke and Germany (2019) explored the transition from collegiate athletic careers to sport retirement. Their research reveals that with this transition, most athletes faced loss of identity, loss of structure, and experienced grief (Menke & Germany, 2019). Yet, Weigand et al. (2013) found conflicting results. Their research concluded that retired college athletes experienced fewer symptoms of depression than current student-athletes. They suggested that the absence of overtraining, fatigue, pressure of competition, and the lack of stress related to studying contributed to the well-being of retired athletes (Weigand et al., 2013). Other research suggests support for worse outcomes, however. According to Doré et al. (2017), the end of the student-athlete's career can result in an array of different affective or anxiety disorders. These afflictions that can range from mild distress to major depressive disorder or debilitating anxiety can be partially explained by social isolation, lack of direction, and general deconditioning (Doré et al., 2017).

For many student-athletes, there is a blurred line between their true identity and their athletic identity. Often, college-athletes heavily identify themselves with their respective sports, and continue to define themselves as former athletes once their athletic careers are completed. Many experience a loss of identity once retirement occurs. An individual's identity should include more than just a role or participation in an activity. True identity also encompasses

values and morals, and it continues to evolve with new roles and with life experience. Having a clearer sense of self identity has been shown to promote self-esteem and happiness, and to decrease the symptoms of depression and anxiety (Heshmat, 2014). Yet, the more an individual's identity relies on their athleticism, the more likely retirement is to lead to additional problems. According to Olympic athlete, Shawn White, "most all [high level athletes] start [some sort of training] before they reach double digits, some as early as two [years old]" (Rapkin, 2020). While differences may exist between Olympians and collegiate athletes, both groups also share similarities in their experiences. Division III student-athletes often start practicing their sport from a young age and spend a considerable amount of time invested in their training. Their college athletic experience and everything it involves requires a substantial time commitment. It includes discipline and regimented self-care. College athletes also have to balance healthy nutrition, sufficient sleep, relationships, and academics. Not unlike Olympians, collegiate student-athletes can also follow a long journey strewn with challenges and pitfalls. The more an individual exclusively identifies as an athlete, the more important the challenges will be after retiring from sport.

The nature of an athlete's journey includes several important aspects. The Athletic Identity Measurement Scale specifically examines an athlete's goals, friendships, and other questions related to how much their life revolves around their sport (Brewer et al., 1993). All of these aspects help compose an athlete's athletic identity, which corresponds to the intensity in which an athlete identifies with their sport, as well as their individual role in it (da Silva et al., 2016). It appears important to have an athletic identity when competing, but it can also prevent an individual from developing a distinct self-identity, unrelated to athleticism. Not knowing one's self-identity can cause problems at the end of an athlete's career. Hunter (2019) used a

quantitative survey design to study the role played by coaches and trainers on the retirement of college athletes. Using a series of questions that related to athletic identity, self-identity, perceived social and emotional support, and mentorship, the author surveyed 270 retired student-athletes. The research found that athletes who do not spend time expanding their full identity and who do not develop goals for life after sport and a more challenging transition into retirement. Hunter found that the successful retirement of an athlete depends more on their preparedness than it does on the relationship they have with coaches and trainers. According to the research, the lack of a distinct self-identity limits student-athletes' ability to change during retirement, negatively impacting their psychosocial behavior (Hunter, 2019).

### **Study and Hypotheses**

The purpose of this research is to examine the effects of retirement on an athlete's mental health. Specifically, it examines the roles played by the end of an athletic career, and of the nature of an individual's athletic identity, and explores this identity's influence over the individual's levels of anxiety and depression. This research offers four hypotheses.

The first hypothesis is that **Division III student-athletes with greater athletic identities will experience more depressive symptoms after the completion of their careers.** If athletes associate themselves strongly with their sport, they will have a harder time developing their true identities. This being the case, retired athletes might struggle with self-esteem and have a more difficult time finding balance in life. A lack of structure in one's life should lead to more depressive symptoms (Heshmat, 2014).

The second hypothesis is that **Division III student-athletes with greater athletic identities will also experience more anxiety symptoms after the completion of their careers.** Similar to the first hypothesis, individuals who have stronger athletic identities will also find it



harder to adapt later in life because their alternate identities are less likely to be developed.

Athletes are also likely to develop general signs of anxiety, even more so than depression, as it is the leading mental illness (American Psychiatric Association, 2017).

The third hypothesis is that retired **Division III student-athletes who do not choose to continue on in recreational activities with others will experience more depressive and anxiety symptoms than those who continue to seek these interactions.** Recreational activities include going to the gym to lift weights, attending a workout class, or joining an adult sports team that include coached practices and optional meets, races, or games. Athletes who maintain their connections to sports will continue to feel attached to their athletic identity. This will keep their life more organized and help them to reduce their depressive and anxiety symptoms. On the other hand, retired athletes who choose not to engage in recreational activities will be more likely to experience signs of mental illness. These individuals will not benefit from the social connections, physical activities or the familiar regimented lifestyle related to the continued athletic engagement.

Finally, the fourth hypothesis is that **Division III student-athletes who have greater athletic identities and remain engaged in sports once they have retired from college athletics will experience lower levels of depression and anxiety compared to those with the same level of athletic identity who do not remain engaged.** The level of athletic engagement post-retirement will affect the mental health outcome more for those with strong athletic identities. Student-athletes with high levels of athletic identity who choose to not continue playing sports are predicted to experience higher levels of depression and anxiety than those who stay engaged. Those with low athletic identities will have lower levels of depression and anxiety whether they continue to partake in sports or not.

## **Methods**

### **Participants**

200 Division III student-athletes will be recruited from across the country to participate in this research. Division III athletic and psychology departments will be contacted; to maintain gender balance across participants, faculty and staff in these departments will be asked to reach out to their student-athletes (100 = female; 100 = male) who will be randomly selected from various sports. Participation in this study will be completely voluntary. Participants will be asked to complete a series of questionnaires that track their athletic identity, their levels of depression, their levels of anxiety, as well as participation in recreational athletics after retirement. They will also be asked to keep a daily log of their mood, vitality, sleep, interaction, and focus. Participants will receive compensation for their involvement as this longitudinal study is a within-studies experiment that will follow the same group of people for thirty-four months. Each individual will receive \$20 each time they complete a questionnaire, and an additional \$10 for every month they complete the Daily Mood Monitor. If an individual completes all six questionnaire sessions, they will receive a total of \$120. Additionally, they will receive a maximum of \$340 if they complete all thirty-four months of the Daily Mood Monitors. Participants will all be seniors in college at the beginning of the study and will be two years removed from their respective schools once the study is complete.

### **Design**

This within-studies research proposal will follow the same 200 participants for thirty-four months. Individuals will be asked a series of questions evaluating their athletic identity, their levels of depression, their levels of anxiety, and their participation in recreational athletics upon retirement. The participants will answer their first questionnaire and begin their Daily Mood

Monitor during the first month of their final year in college. The questionnaire will be divided into four parts. First, athletes will complete a portion that relates to athletic identity which specifically covers social identity, exclusivity, and negative affectivity. This portion will only be measured at the onset of the study, as athletic identity is not predicted to change over time. For each question, participants will have to indicate where they stand on a Likert scale from *completely disagree* (0) to *agree* (7). Then, participants will be asked to answer a depression screening tool and an anxiety screening tool using a Likert scale from *not at all* (0) to *nearly every day* (3). Additionally, participants will complete a multiple choice questionnaire relating to their involvement in recreational athletics post-retirement. Participants will also be asked to complete a Daily Mood Monitor which includes a Likert scale from 5 (best) to 1 (worst). The chart will track five different variables: mood, vitality, sleep, interaction, and focus.

### **Measures**

Participants will rate the dependent variables—depression, anxiety, and mood—on four specific Likert scales. Athletic Identity will be evaluated on an eight-point scale that ranges from *completely disagree* to *agree*. Depression will be measured on a four-point scale ranging from *not at all* to *completely every day*. Topics will include questions about an individual's interests and pleasure, their feelings and hopelessness, their ability to fall asleep, their level of energy, their appetite, their social relationships, their ability to concentrate, and their levels of motivation and ability to function daily. For example, "How difficult is it for you to do your work, take care of things at home, or to get along with other people?". Anxiety will also be measured on a four-point scale ranging from *not at all* to *completely every day*. Categories will include questions about an individual's levels of worryness, their restlessness, irritability, sleep pattern, levels of fatigue, and muscle tension. Questions on the Anxiety Screening Tool include the

following example: “During the last six months, have you been bothered by excessive worries more days than not?”. Recreational activity involvement will identify the nature of the athletic engagement and the amount of time dedicated to the activity.

### **Procedure**

Participants will have to agree to partake in this study and will have to sign a consent form before answering any questions. This composite of twenty-one questions with five additional daily questions, will ask athletes about their athletic identity, levels of depression, levels of anxiety, and daily mood. Participating college athletes will begin the study in the beginning of their senior year. Once they have completed their first questionnaire, with all three portions—athletic identity, depression, and anxiety—they will receive 34 Daily Mood Monitor sheets and will start completing them daily. When participants complete their remaining questionnaires, they will only be instructed to complete the depression and anxiety screening tools. The second questionnaire session will occur in July, about a month after graduating from college, ensuring all athletes have completed their sports careers. Then, participants will complete a third session in October, three months after they have finished their athletic career. This testing session, as well as the remaining ones, will not only include depression and anxiety screening tools, but will also evaluate participants on their level of engagement in recreational athletics post-retirement. Their fourth session will be in January, six months into retirement. Their penultimate and final testing sessions will occur one year and two years after participants have completed their athletic careers. After thirty-four months, participants will be debriefed about the purpose of this experiment and how their input will contribute.

### **Expected Results**

If this research were conducted, results would likely support all four hypotheses. Data collected longitudinally for thirty-four months would reveal that Division III student-athletes with greater athletic identities have greater levels of depression and greater levels of anxiety, especially when they do not engage in recreational activities post-retirement. A larger number of student-athletes with high levels of athletic identities will experience anxiety as opposed to depression as anxiety remains a more common mental illness. Division III student-athletes who do not remain engaged in social recreational activities will have higher levels of depression and anxiety than those who participate in sports after college. Finally, student-athletes with greater levels of athletic identities who continue to participate in athletics after retirement will experience lower levels of depression and anxiety than those who do not remain engaged in sports.

### **Discussion**

#### **Summary**

This research examined the effects of retirement and athletic identity on student-athletes' mental health. The research focused on how athletic retirement may lead to two common mental illnesses: depression and anxiety. Participants were asked to complete several questionnaires that assessed their levels of athletic identity, their levels of depression and anxiety, and their participation in recreational athletics after retirement. This longitudinal study followed the same 200 participants and compared the data collected over a span of thirty-four months. Information was gathered at the beginning of individuals' senior year and up until two years after their graduation from their respective colleges.

Retirement from collegiate athletics affects student-athletes differently, depending on the perception they have of themselves and on how they continue to stay active after college graduation. Participants with higher athletic identities are expected to report higher levels of depression and anxiety when they did not remain active in athletics. Those with strong athletic identity who continue to participate in athletics or social recreation are likely to fare better physically and mentally.

### **Conclusion**

According to the NCAA (2020), nearly half a million student-athletes currently participate on athletic teams across three divisions at the collegiate level (NCAA, 2020). From that group, only about 2% will move on to compete professionally when they leave college. Athletes who compete at the Division III level are even less likely to continue an athletic career at that time. The vast majority of collegiate student-athletes (about 98%) will end their athletic career after college (NCAA, 2020). The process of retiring from college athletics may come with challenges for young adults who have been spending an important part of their life training, surrounded by coaches and teammates. Retired student-athletes no longer benefit from the structure and support offered by their team. They have to reorient their goals and shift their focus toward life after collegiate sports. This transition to a new lifestyle can cause adjustment difficulties and impact the mental health and mental disposition of the retired student-athletes. The end of an athletic career can result in an array of different affective or anxiety disorders that can range from mild distress to major depressive disorder or debilitating anxiety. Social isolation, lack of direction, and general deconditioning can affect the well-being of retired athletes. A person's athletic identity, which involves how an individual perceives and defines themselves, can also influence the nature of their mental health. It may be more challenging for

individuals who have exclusively defined themselves as athletes without developing interests or connections outside of their athletic world to adjust psychologically once sports are no longer a part of their life.

While athletic identity plays an important role in the life of student-athletes, it is beneficial for retired athletes to remain active, widen their horizons and not simply see themselves as athletes, but as well-rounded individuals. Regardless of one's level of athletic identity, it is better to stay physically and socially engaged after the completion of one's collegiate career to maintain better mental health and overall wellness.

### **Limitations**

Since the current proposal was never conducted, it remains difficult to extrapolate the results or truly determine the effects of retirement on student-athletes' mental health. The lack of real data makes it difficult to identify the causal relationships that help retired collegiate athletes to retain good mental health and overall well-being.

### **Recommendations for Future Studies**

There has been limited research comparing the effects of retirement on student-athletes' mental health. More research would likely benefit current and future student-athletes' mental health. Future research should also explore athletes' identity and their mental health throughout their careers before retirement. It would also be beneficial for this proposal to be conducted so researchers can better understand the effects of retirement on student-athletes' mental health instead of basing their beliefs on intuition. Additionally, it would be beneficial to study how colleges can best prepare and support student-athletes and their mental health in their transition to retirement. Results from such studies could increase the quality of interventions and improve

the quality of life of athletes post-retirement. This would hopefully decrease the likelihood of depression and anxiety experienced by retired college athletes.



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### Appendix

#### Athletic Identity Portion Questionnaire: social identity, exclusivity, negative affectivity

1. I consider myself an athlete.

0	1	2	3	4	5	6	7
completely disagree			neutral		agree		

2. I have many goals related to the sport.

0	1	2	3	4	5	6	7
completely disagree			neutral		agree		

3. Most of my friends are athletes.

0	1	2	3	4	5	6	7
completely disagree			neutral		agree		

4. Sport is the most important part of my life.

0	1	2	3	4	5	6	7
completely disagree			neutral		agree		

5. I spend more time thinking about sport than anything else.

0	1	2	3	4	5	6	7
completely disagree			neutral		agree		

6. I feel bad about myself when I do poorly in sport.

0	1	2	3	4	5	6	7
completely disagree			neutral		agree		

7. I would be very depressed if I were injured and could not compete in sport.

0	1	2	3	4	5	6	7
completely disagree			neutral		agree		

## Depression Screening Tool:

1. Little interest or pleasure in doing things

0	1	2	3
not at all	several days	more than half the days	nearly every day

2. Feeling down, depressed, or hopeless

0	1	2	3
not at all	several days	more than half the days	nearly every day

3. Trouble falling or staying asleep, or sleeping too much

0	1	2	3
not at all	several days	more than half the days	nearly every day

4. Feeling tired or having little energy

0	1	2	3
not at all	several days	more than half the days	nearly every day

5. Poor appetite or overeating

0	1	2	3
not at all	several days	more than half the days	nearly every day

6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down

0	1	2	3
not at all	several days	more than half the days	nearly every day

7. Trouble concentrating on things such as reading the newspaper or watching television

0	1	2	3
not at all	several days	more than half the days	nearly every day

8. Moving or speaking so slowly that other people could have noticed or the opposite—being so fidgety or restless that you have been moving around a lot more than usual

0	1	2	3
not at all	several days	more than half the days	nearly every day

9. Thoughts that you would be better off dead or of hurting yourself in some way

0	1	2	3
not at all	several days	more than half the days	nearly every day

10. How difficult is it for you to do your work, take care of things at home, or to get along with other people?

0	1	2	3
not difficult at all	somewhat difficult	very difficult	extremely difficult



Anxiety Screening Tool:

1. Are you troubled by the following?

- Yes/No - Do you experience excessive worry?
- Is your worry excessive in intensity, frequency, or amount of distress it causes?
- Do you find it difficult to control the worry (or stop worrying) once it starts?
- Do you worry excessively or uncontrollably about minor things such as being late for an appointment, minor repair, homework...?

2. What are the most frequent topics you worry excessively or uncontrollably about?

3. Yes/No - During the last six months, have you been bothered by excessive worries more days than not?

4. During the past six months, have you often been bothered by any of the following symptoms?

- Restlessness of feeling keyed up or on edge

0	1	2	3	4	5	6	7	8
not at all		a little		moderately		quite a bit		extremely

- Irritability

0	1	2	3	4	5	6	7	8
not at all		a little		moderately		quite a bit		extremely

- Difficulty falling/staying asleep or restless/unsatisfying sleep

0	1	2	3	4	5	6	7	8
not at all		a little		moderately		quite a bit		extremely

- Being easily fatigued

0	1	2	3	4	5	6	7	8
not at all		a little		moderately		quite a bit		extremely

- Difficulty concentrating or mind going blank

0	1	2	3	4	5	6	7	8
not at all		a little		moderately		quite a bit		extremely

- Muscle tension

0	1	2	3	4	5	6	7	8
not at all		a little		moderately		quite a bit		extremely

## Recreation Engagement Assessment:

1. Are you currently involved in recreational athletics?
  - Yes, I participate in recreational sports
  - Yes, I coach recreational sports
  - No, I am not currently involved in recreational athletics
  
2. How many days per week are you currently exercising
  - 1 day    2 days    3 days    4 days    5 days    6 days    7 days
  
3. How many minutes per day are you currently exercising?
  - Less than 30 min    30 min    60 min    90 min    120 min    180 min or more

Daily Mood Monitor:

### Daily Mood Monitor

**How to use:**

Month: 1 2 3 4 5 6 7 8 9 10 11 12

Each day of the month, fill in one of the five numbers for Mood, Vitality, Sleep, Interaction, and Focus (five being best, one worst). Then, draw a line connecting all the filled-in circles in each category to get an overall sense of the month and discuss your results with your doctor.

	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
<p><b>Mood</b> Rate your overall mood for the day.</p>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
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<p><b>Vitality</b> Rate your ability to get going and accomplish your daily tasks.</p>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
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<p><b>Sleep</b> Rate how well you slept last night.</p>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
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<p><b>Interaction</b> Rate your ability to interact in social situations.</p>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
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<p><b>Focus</b> Rate your ability to focus during the day.</p>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Figure 1: SF-36 Factor Structure

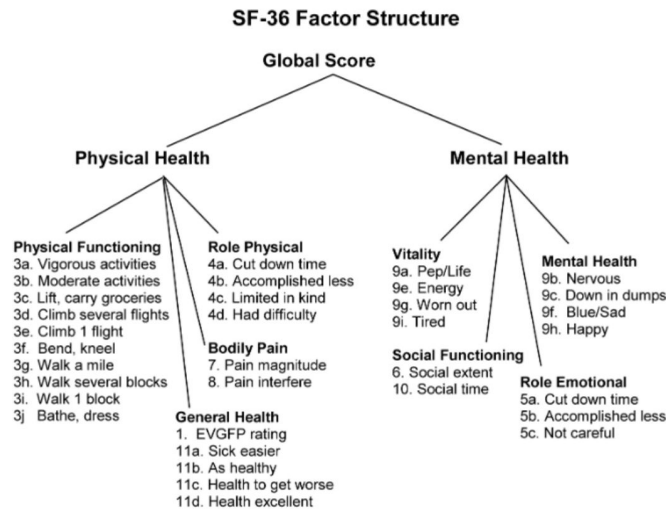


Figure 1 — Subscales and composite scores of the Medical Outcomes Study Short Form Health Survey (SF-36). EVGFP indicates excellent, very good, good, fair, and poor.

Figure 2: PODCI Factor Structure

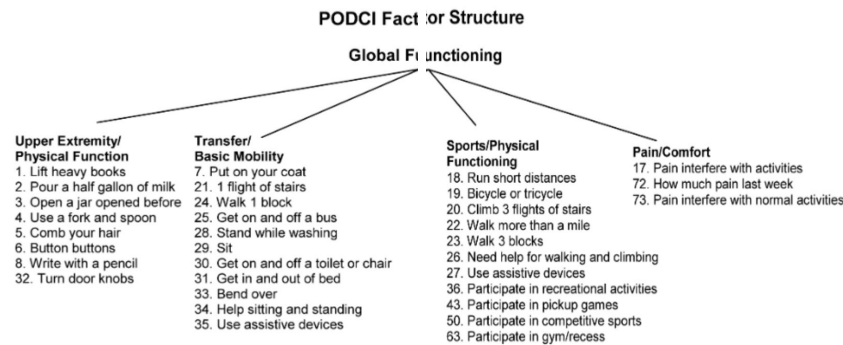


Figure 2 — Subscales and composite scores of the Pediatric Orthopedic Society of North America Pediatric Outcomes Data Collection Instrument (PODCI).