Depression and Anxiety in injured College Athletes Compared to Non-injured College Athletes

Katie Barraco

Department of Psychology and Behavioral Sciences, Rochester University

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Dr. Jessica J. Matyas

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ABSTRACT

The role of depression and anxiety on college athletes has been studied and well-documented, yet the relationship between depression and anxiety on injured college athletes needs further exploration. The present study hopes to explore how injuries on women and men in college sports affect their mental health such as depression and anxiety. The purpose is to find a connection between athletes who are injured and the likelihood of developing depression and anxiety. In this study, 35 participants were asked to fill out a survey which included questions based off the Beck Anxiety Inventory and Beck's Depression Inventory. Results showed high statistical significance between depression and anxiety in injured college athletes and there is a significant difference between the rates of depression and anxiety in injured versus non-injured athletes. Injured players, when compared to non-injured players, showed significantly increased levels of depression as well as increased levels of anxiety. Non-injured players showed some signs of distress but not enough to be significant. Potential confounds that may have affected results were participants may have already had depression or anxiety before sustaining an injury, and there is no way of telling if their depression and anxiety is from other factors or if the injury made these symptoms more prominent. From these findings, colleges can acknowledge the mental state of their injured players and accommodate for them. They will be able to create a better environment for athletes and allow the athletes to talk to a sports counselor about their injuries and mental health.

INTRODUCTION

Depression and anxiety is seen in 3.8 percent of the population. Depression is a mood disorder that consists of many symptoms ranging from losing interest in the activities you love to feeling sad and hopeless. Anxiety on the other hand is a something that everyone has felt once in their lives but anxiety disorders come in many forms and can be seen as panic attacks, feeling nervous all the time, fear of the worst happening, or even sweating. These two mental disorders effect people from 10 years old, 30 years old to 60 years old. People can be affected for many reasons such as trauma, stressful live events or even injury. One population of people that depression and anxiety is seen in is college athletes. College athletes go through many stressful events in their day-to-day lives. One major concern is the injuries that college athletes face. The trauma that these athletes endure from injuries is a leading factor in depression and anxiety for this population.

Depression

There are various forms of depression that range from mild to severe conditions. The more severe cases of depression are psychotic depression which include hallucinations and delusions (Fekadu *et al.,* 2017). Depression is a chronic mental disorder with many symptoms ranging from loss of interest in activities, feeling hopeless, feeling sad, sleeping too much or not enough, distancing yourself, or eating too much or not enough. It changes the way we think, behave, and act. Depression takes away a person's ability to live their life the way they want to. This disorder comes from trauma, life stressors, a big change in their life, changing of the seasons, or from a chemical imbalance in the brain. When a person develops depression, it affects the prefrontal cortex and the amygdala in the brain. The grey matter in the prefrontal cortex decreases and the glial density is reduced. The amygdala regulates emotions and stress

and when someone has depression it is shown that the amygdala shrinks in size. Also the mesolimbic dopamine system is in charge of the reward response to pleasure and when effected there will be a feeling of lack of pleasure. Another cause for this disorder is the lack of the neurotransmitter, serotonin. Serotonin is responsible for mood regulation and when there is a reduced level of these neurotransmitters a person will feel a shift in their mood such as feeling more sad than usual.

Depression in Athletes

Athletes are at high risk for depression because of the stress that goes in to competing, training, and being a student. In a study comparing current athletes and retired athletes depression rates it showed that depression rates were actually higher in current athletes compared to non-athletes because of their additional stressors (Weigand *et al.,* 2013). Overtraining is one stressor that was hypothesized in this study. It was found that 400 competitive swimmers were more depressed during their training workload and when there was no training their depression was reduced. Also, the stigma of depression leads student athletes to hide from their depression instead of seeking help. The most significant reason for increased depression in student athletes is sustaining an injury. These athletes who have a sports related injury showed 1.64 greater odds ratio of being depressed than those who did not sustain an injury.

Therapeutic treatments

When it comes to depression there are many options to treat the disorder which can be with medications or with therapeutic options. Therapeutic options have shown to be the best option for those suffering with depression. Psychotherapy is very common when treating this disorder. Psychotherapy helps modify the patients behaviors and thinking process (Cuijpers *et al.,* 2019). Within psychotherapy there are many different forms such as cognitive behavioral

therapy or behavioral activation therapy. Cognitive behavioral therapy (CBT) will have patients understanding their own thinking, observe their thinking process, and then change it to be more positive. On the other hand, Behavioral activation therapy will have the patient understand what makes them happy or gives them pleasure and implement it in their daily life. This will increase positive interactions between the person and their environment. A study done in 2016 had junior mental health workers deliver behavioral activation therapy to depressed patients and had therapist deliver CBT to depressed patients (Kaier *et al.,* 2015). The outcome showed that there were no differences between the two therapies and each worked effectively. These therapies can be effective in student athletes and can be implemented for athletes who are going through an injury. But, in a recent study that evaluated stigma of depression felt by athletes versus nonathletes, they found that athletes show more of a stigma towards depression than nonathletes. They found that because athletes have negative attitudes towards depression, they are less likely to utilize their resources and do not seek help. Thus leading to more depressed student athletes.

Anxiety

There are many forms of anxiety which include generalized anxiety disorder, obsessive-compulsive disorder, panic disorders, post-traumatic stress disorder, separation anxiety, panic attacks, and phobias (Strohle *et al.,* 2018). When someone has an anxiety disorder they are more likely to get another form of anxiety disorders. There are many reasons someone may develop anxiety such as genetics, abuse or neglect, chronic illness, traumatic events, divorce, deaths, or even financial difficulties. When a person develops anxiety their brain is affected. Affected areas of the brain are the amygdala and the frontal lobe (Gadye, 2018). There is hyperactivity in the amygdala and the dorsal anterior cingulate cortex (region in the frontal lobe) amplifies fear response in the amygdala.

Anxiety in Athletes

3 to 7 million athletes injure themselves each year in the U.S (Hsu *et al.,* 2016). Athletes who have a sports injury not only have physical impairments but psychological ones as well. Athletes who have injured themselves within the sport they play show signs of anxiety, frustration, low self-esteem, and depression. These responses are at their peak when injured but usually get better during rehabilitation. Many injured athletes fall back into these responses when they get closer to being able to play in their sport again. This is because they have a fear of reinjuring themselves when they get back to playing. When they have this fear it slows down the rehabilitation process and they are more likely to hurt themselves in the future. Reinjury anxiety refers to the resulting irrational fears or anxiety that physical movements will result in painful reinjury (Sheinbein, 2016). Research that examined reinjury anxiety has found that this type of anxiety is always present in athletes, especially when there has been a serious injury.

Therapeutic treatments

Cognitive behavioral therapy is a type of therapy that works with all types of anxiety (Strohle *et al.,* 2018). With CBT helping anxiety disorders it is best used with some exposure therapy to help expose the patient to what is bothering them. They also will take the situation that is causing them stress and try to reduce the anxiety for that specific event and make it seem harmless. This would be helpful in injured athletes to help reduce the anxiety that comes with their specific situation of fear of reinjury.

Research Question

These findings give information about what exactly depression and anxiety are and how they are shown in athletes. It indicated what may causes depression and anxiety in players and the difference of depression and anxiety in athletes compared to non-athletes. Although they give

information on the effects of injuries on players mental health there is not enough research on if

athletes who have an injury suffer worse from depression and anxiety than athletes who do not

suffer from an injury.

HYPOTHESES

Injured college athletes were expected to show more signs of depression and anxiety than

non-injured college athletes. The scores average on the inventories would be higher in injured

athletes in both depression and anxiety than in non-injured athletes. It was also expected that

there would be specific injuries that cause more depression and anxiety in injured athletes. It was

anticipated that there would be a high significant difference between injured players and

depression and a high significant difference between injured players and anxiety.

METHODS

Participants

The research consisted of 35 participants. All participants were women from the ages of

18 to 26. They were separated into groups of injured college athletes and non-injured college

athletes. Of the 35 participants, 25 were non-injured college athletes and 10 were injured college

athletes.

Design/Measures

A two tailed t-test was ran. Scores were gathered and measured for Beck's depression

inventory and Beck's Anxiety Inventory and compared between injured and non-injured athletes.

Procedures

Each participant filled out a consent form (Appendix A) before joining the research. Once

they gave consent to be a part of the study, they filled out questions about themselves on survey

ranging from what age they were to if they play any college sports and if they are in college

(Appendix D). If they were younger than 18 or were not playing a college sport they were not able to participant and the survey ended. If they were older than 18 and played a college sport they were able to continue. They then filled out if they were injured or not and what type of injury they were suffering from. Then the participants took part in the Beck's depression inventory (Appendix B) followed by the Beck anxiety inventory (Appendix C). After answering these questions, they read a note at the bottom that says they can go see the therapist on campus if their mental health felt affected by any of these questions. After they finished the survey they were asked again if they gave consent to use their data. If they answered yes the survey ended and the data was collected. If they answered no, the survey ended and the data was not used. They then were thanked for their participation.

RESULTS

Participants

The target population was all college athletes who suffered an injury or did not suffer an injury. The participants were all women including 25 non-injured athletes and 10 injured athletes. The data was limited because there were not enough injured athletes to get accurate data. As well there were no men to see if men's scores would differ from women.

Depression Scores

Depression in injured athletes showed an average score on the Beck's inventory scale of 15.1 and non-injured athletes scored 9.32 (Figure 1). There were 14 out of 25 non-injured athletes who should no signs of depression. 8 out 10 injured athletes showed signs of depression. There were significant differences between groups in depression, $t(9) = 4.9$, $p<.001$, with injured athletes receiving higher scores than non-injured athletes.

Anxiety scores

Anxiety in injured athletes showed an average score of 11.6 while non-injured athletes showed an average of 9.04 on Beck's anxiety inventory scale. There were 21 non-injured athletes that showed no signs of anxiety and 8 injured players that showed no signs of anxiety. The significance was $t(9)= 3.1$, $p<.01$, injured players showed higher signs of anxiety (Figure 2).

Identifying Injuries that may affect depression and anxiety

There were no particular types of injuries that showed more anxiety than the other. On the depression inventory scale, back injuries had an average score of 22.6 showing that back injuries may have caused the most depression. The biggest score on the depression inventory by itself was an ACL tear with a score of 32 but the other ACL tears were scored at a 1 so there were no correlation between ACL tears specifically causing depression.

DISCUSSION

Depression scores

Injured college athletes showed higher scores on the Beck's depression inventory than non-injured college athletes. Depression is seen to be higher in injured college athletes compared to non-injured athletes. A small amount of non-injured college athletes showed signs of depression but the majority showed zero signs of depression according to this one particular test. Whereas majority of injured college athletes showed signs of depression and only 2 showed no signs of depression. Injured athletes may have shown high scores of depression because of the stress that they are put under to recover faster. They also have to go through rehabilitation which adds another stressor onto their plate.

Anxiety scores

Injured college athletes showed higher scores on the Beck's anxiety inventory than non-injured college athletes. Anxiety is seen to be higher in injured college athletes based on

their scores. Although they scored higher there was only 2 participants out of 10 that showed moderate levels of anxiety. Anxiety may not be a factor in all injuries and more participants for this group were needed to see if there is a correlation.

Identifying Injuries that may affect depression and anxiety

There were no specific groups of injuries that showed enhanced scores of anxiety on the Beck's anxiety inventory. On the Beck's depression inventory scale back injuries showed a higher average score than other groups of injuries. The highest score for both the depression and anxiety inventory were ACL tears but the average score of all the ACL tears combined were low.

Limitations to the study

In the study, only 10 out of the 25 participants were injured. There was not enough data on injured players to fully compare them with non-injured players. Also, there were no men that filled out the survey so the results that were reached are not representative of how men's mental health is affected by injuries and can only be used to identify depression and anxiety in females athletes.

CONCLUSIONS & FUTURE DIRECTIONS

Depression and anxiety are apparent in injured college athletes. Although many college athletes go through some type of depression and anxiety, they appear to increase when there is an injury involved. There are many therapeutic treatments such as CBT and behavioral activation therapy that can help with these disorders, but as research shows, athletes do not want to admit or show they have these disorders because of the stigma around them. This research can take away the stigma that lies behind college athletes and depression and anxiety and help these athletes in the future. This research can bring light to what these injured college athletes are going through

and allow for a sports counselor to be added to each program in colleges and universities so the athletes have someone to talk to about the issues they are going through. Further research does need to be done in order to see if men experience the same mental health problems as women. Also, their needs to be more research done with a bigger sample size of injured college athletes so that there can be better comparisons between the two groups. We can also take this research further by finding out what injuries cause the most depression and anxiety in college athletes so that we can focus more time into helping those that suffer from these injuries. Furthermore, research teams can look into the effects injuries have on other groups of athletes such as high schoolers or travel teams so that they can get help as well.

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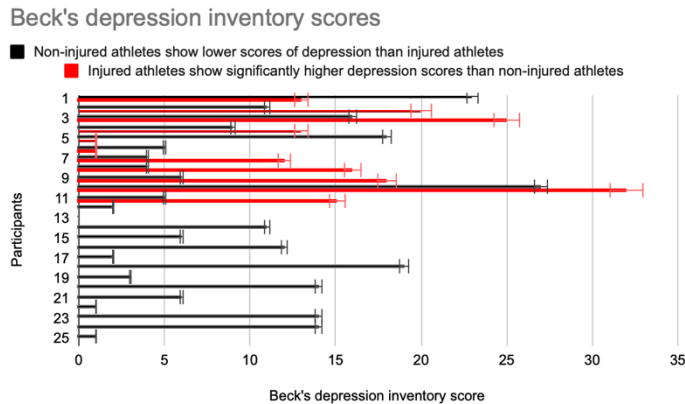
FIGURES

Figure 1. Beck's depression inventory scores. Each number is specific to a participant in the research study. Black is for non-injured players and red is for injured players. This shows the scores of each participant in the study's depression scores from the inventory. The significance was $t(9) = 4.9$, $p<.001$.
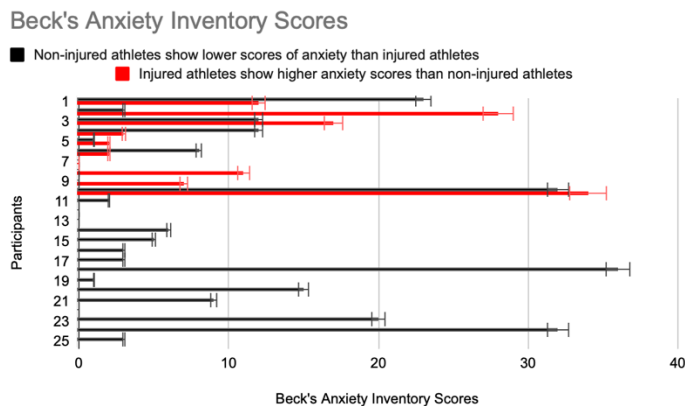
Figure 2. Beck's Anxiety Inventory Scores. Each number is specific to a participant in the research study. Black is for non-injured college athletes and red is for injured college athletes. This shows the scores of each participant in the study's anxiety scores from the inventory. Significance was $t(9)= 3.1$, $p<.01$.

APPENDIX A

Consent Form

Consent to Participate in Research

Anxiety and Depression in Injured College Athletes Compared to Non-injured College Athletes

The Research Team

The following research is being conducted by a trained research team who may be reached at the

following contacts:

Primary Researcher: Faculty Sponsor:

Katie Barraco   Dr. Jessica J Matyas
kbarraco@rochesteru.edu   JMatyas@rochesteru.edu
                                                            Office: (248) 218 - 2157

Purpose of the study

This study is to see how injured college athletes mental health is affected when they are

unable to play their sport and if the pain and support from their team plays a role into their

mental health. This will be done by comparing healthy non-injured college athletes with the

injured college athletes. This will allow athletes in the future to get better mental and emotional

support by their team and school when going through an injury. The findings will also be able to

compare what injuries have the most effect on their mental health and if coaches need to have

more recovery practices for the players so there is less injuries in the future.

Procedures

This experiment is expected to take 10 minutes to complete. I will then collect contact

information such as emails in order to contact the participant within 24 hours of taking the

survey if they are feeling any distress or self-harm. You will be asked to fill out each question

such as general question and from Becks anxiety inventory and Beck's depression inventory. If a

question causes distress to the participants there will be a red flag that brings them to the suicide

hotline and asks if they want to keep moving further with the study. You are welcome to contact the research team after completing your participation if you would like to learn more about the results of the experiment.

Risks Involved in Participation

Care has been taken to minimize or eliminate significant risks during the procedures of this experiment. Those who feel distressed or uncomfortable are invited to reach out to the MacKinnon Psychology and Counselling Center by emailing GMacKinnon@rochesteru.edu. They may also contact the suicide hotline by calling the number 988. Potential negative effects that you may experience during the course of this study include:

- Temporary discomfort due to asking about your emotional status

- Triggers that can affect your mental health

While the present study is collecting data such as your name and email address this data will remain confidential and be stored in a secure server until the completion of the study, at which time it will be destroyed. At no time will your personal information be available to anyone outside of the above research team.

Benefits of the Current Research

If successful, the results of this study will show that injured college athletes will have more anxiety and depression than non-injured college athletes and will lead to injured athletes getting better emotional support from their colleges. Participation in the experiment may lead the participants to feel positive emotions like satisfaction and social approval because they participated in an experiment that may lead to more positive outcomes for college athletes in the future.

Signature of Informed Consent

I have read and understood the above information, and voluntarily agree to participate. I

understand that my participation in this study is entirely voluntary, and that I may withdraw my

consent at any time with no penalty or consequences.

Your signature _____   Date: _____

Your name (printed) _____

_____ (initial) I would like to receive a copy of this form upon completion

APPENDIX B

Survey Instrument

Beck's Depression Inventory

This depression inventory can be self-scored. The scoring scale is at the end of the questionnaire.

1.

    0   I do not feel sad.

    1   I feel sad

    2   I am sad all the time and I can't snap out of it.

    3   I am so sad and unhappy that I can't stand it.

2.

    0   I am not particularly discouraged about the future.

    1   I feel discouraged about the future.

    2   I feel I have nothing to look forward to.

    3   I feel the future is hopeless and that things cannot improve.

3.

    0   I do not feel like a failure.

    1   I feel I have failed more than the average person.

    2   As I look back on my life, all I can see is a lot of failures.

    3   I feel I am a complete failure as a person.

Total Score_____Levels of Depression

1-10_____These ups and downs are considered normal

11-16_____ Mild mood disturbance

17-20_____Borderline clinical depression

21-30_____Moderate depression

31-40_____Severe depression

over 40_____Extreme depression

APPENDIX C

Survey Instrument

Beck Anxiety Inventory

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by circling the number in the corresponding space in the column next to each symptom.

	Not At All	Mildly but it didn't bother me much.	Moderately - it wasn't pleasant at times	Severely – it bothered me a lot
Numbness or tingling	0	1	2	3
Feeling hot	0	1	2	3
Wobbliness in legs	0	1	2	3
Unable to relax	0	1	2	3
Fear of worst happening	0	1	2	3
Dizzy or lightheaded	0	1	2	3
Heart pounding/racing	0	1	2	3
Unsteady	0	1	2	3
Terrified or afraid	0	1	2	3
Nervous	0	1	2	3
Feeling of choking	0	1	2	3
Hands trembling	0	1	2	3
Shaky / unsteady	0	1	2	3
Fear of losing control	0	1	2	3
Difficulty in breathing	0	1	2	3
Fear of dying	0	1	2	3
Scared	0	1	2	3
Indigestion	0	1	2	3
Faint / lightheaded	0	1	2	3
Face flushed	0	1	2	3
Hot/cold sweats	0	1	2	3
Column Sum				

Scoring - Sum each column. Then sum the column totals to achieve a grand score. Write that score here _____ .

Interpretation

A grand sum between **0 – 21** indicates very low anxiety. That is usually a good thing. However, it is possible that you might be unrealistic in either your assessment which would be denial or that you have learned to "mask" the symptoms commonly associated with anxiety. Too little "anxiety" could indicate that you are detached from yourself, others, or your environment.

A grand sum between **22 – 35** indicates moderate anxiety. Your body is trying to tell you something. Look for patterns as to when and why you experience the symptoms described above. For example, if it occurs prior to public speaking and your job requires a lot of presentations you may want to find ways to calm yourself before speaking or let others do some of the presentations. You may have some conflict issues that need to be resolved. Clearly, it is not "panic" time but you want to find ways to manage the stress you feel.

A grand sum that **exceeds 36** is a potential cause for concern. Again, look for patterns or times when you tend to feel the symptoms you have circled. Persistent and high anxiety is not a sign of personal weakness or failure. It is, however, something that needs to be proactively treated or there could be significant impacts to you mentally and physically. You may want to consult a counselor if the feelings persist.

APPENDIX D

Survey Instrument

What Gender do you identify as? *

○ Female

○ Male

○ Non-Binary

○ They/them

○ Prefer not to say

What is your age range? *

○ Under 18

○ 18-21

○ 22-26

○ 27-31

Are you currently enrolled in a college? *

○ Yes

○ No

Are you currently playing a college sport? *

○ Yes

○ No

If answered yes to previous question, what college sport do you play? *

Short answer text

Are you currently suffering from an injuring from your sport? *

○ Yes

○ No

What injuring are you suffering from? If none then answer N/A *

Short answer text