Past Concussion, Depression, and Social Support

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Abstract

Introduction

Concussions are a major health concern in the United States. Concussions have been linked to multiple health issues, from CTE to depression. While the link between concussions and depression has been established, there is a lack of research regarding what may influence that relationship. Low levels of social support have been found to be a risk factor for depression. Because of a required withdrawal from social activities due to concussion protocol, it is our hypothesis that perceived social support is a mediating factor in depression after concussions.

Methods

Participants were recruited from a large Midwestern university and answered questionnaires online. They were asked about their concussion history including questions about medical diagnoses, as well as questions from the Rivermead Post Concussion Questionnaire. They were also completed questionnaires assessing perceived social support and symptoms of depression.

Results

There were no significant differences between the concussion group and non-concussion group on any of our variables. However, concussion symptom severity was positively associated with anxiety and negatively associated with overall psychological health.

Discussion

While our results do not show a significant relationship between concussions and depression, the small sample size likely resulted in low statistical power to detect a significant

effect. While these results do not indicate that social support is important in post-concussion depression, future research should measure the variables with a larger sample, while also examine more related variables such as anxiety and overall psychological health.

Past Concussion, Depression, and Social Support

In 2014, there were 2.4 million traumatic brain injury emergency room visits. Of those, about 75% were for Mild Traumatic Brain Injuries, or concussions (CDC, 2019). The immediate effects of concussions can last weeks. The long term effects of concussions, such as cognitive deficits, can last years or even be permanent (Manley et al., 2017). Physical symptoms of a concussion include headache, mobility and coordination difficulties, dizziness, and even loss of consciousness ("Physical Effects of Brain Injury", 2012). According to current protocol, patients with concussions should refrain from typical activities for at least a few days until their doctor clears them to begin to easing back into activities. Patients ease back into strenuous activities with guidance from a doctor, and they are not considered fully recovered until after they are able to perform all of their activities without experiencing any concussion symptoms ("Recovery from Concussion", 2019). The guidelines for recovering from the physical effects of concussions are clearly defined for patients and practitioners, however, little is suggested for the recovery of psychological symptoms of concussions.

Although concussions are commonly associated with physical symptoms, there are often psychological symptoms that are an important aspect of recovery. Psychological effects of concussions can include mood disorders such as anxiety and depression, as well as cognitive impairment (Decq. et al., 2016). Decq and colleagues (2016) examined 239 retired rugby players and 138 other players 20 years after their careers were over. They found that retired rugby players had higher rates of depression than other sports players. Additionally, there was a positive relationship between depression symptoms and number of reported concussions, regardless of which sport the players had reported playing.

Furthermore, a study of high school and college athletes that experienced concussions found that athletes experienced increased levels of depression up to 14 days after their concussions. This study did not continue to monitor depression levels after the concussion however, so any symptoms that continued to occur were not measured (Kontos, Covassin, Elbin, & Parker, 2012).

To date, the research on concussions is largely focused on athletes and veteran populations. There is little, if any, research examining the impact of concussions on the general population. Although athlete and veteran populations are important to study, there is a large gap in the literature in understanding the impact of concussions on the general population.

Social Support

A study by Shrebourn and colleagues (1995), studied risk factors for depression and found that better recovery outcomes were linked with higher levels of social support. The study examined over 600 patients with depression and found that social support was related to increased recovery outcomes (Shrebourn, Hays, &Wells, 1995).

Another study that examined the role of social support and depression controlled for other factors such as personality and other mood disorders. This study examined 59 patients with clinically diagnosed depression and their levels of perceived social support and found that levels of perceived social support were related to lower severity of depressive symptoms. They also found that levels of social support predicted recovery rates (Lara, Leader, & Klein, 1997). This was the first study that found that social support is a factor in depression outside of personality and other factors.

Another study examined social support as a buffering factor against depression, not just as a factor useful for recovery. The study had a sample of 275 undergraduates and it found that low levels of social support were associated with higher levels of depression symptoms and higher levels of social support were associated with lower levels of depression (Zimet et al., 1988).

More recently, a meta-analysis also found that there was a significant protective relationship between social support and depression (Gareipy, Honkaneimi, & Quesnel-Vallee, 2018). This shows consistent evidence that higher levels of social support are a protective factor against depression, which indicates that lower levels of social support could be a risk factor in depression.

Current Study

Due to the emphasis on the physical symptoms of concussions, protocol dictates that individuals with concussions must withdraw from activities. Because of the link between concussions and depression and the relationship between social support and depression, social support could be a possible factor in post-concussion depression. The withdrawal from activities could logically lead patients to feel isolated due to a lack of social interaction. The lack of social interaction, especially when combined with physical pain from concussion symptoms can cause significant psychological distress. This could be a factor in the development of depression after concussion.

The current study seeks to fill the gap in the concussion literature by examining the impact of a history of concussions on depression through the mechanism of social support. We hypothesized that that more reported concussions would be associated with higher rates of

depression, lower levels of social support, and that a history of concussions would be associated with higher levels of depression through the mechanism of social support.

Methods

Participants

58 participants were recruited from a large Midwestern University (M_{age} = 20.3, SD = 3.6). The study was approved through the Institutional Review Board, and all proper protocols were followed. Table 1 provides demographic information about the sample.

Table 1. Sample characteristics.

Sample Characteristics (n = 58)	*n*	*%*
Gender		
Women	37	63.8
Men	20	34.5
Race/ethnicity		
Native American	5	8.6
Asian	3	5.2
African American	2	3.4
Caucasian/White	44	75.9
Hispanic/Latino	0	0
Multiple	3	5.2

Measures

Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 (Kroenke, Spitzer, and Williams, 2001) is a 9-item self-report measure aimed to assess for depression according to the core diagnostic criteria in the DSM-5. Participants are asked to answer questions based on their feelings over the past two weeks. Each question is rated on a scale from 0 to 3 with 0 being “not at all” and 3 “nearly every day”. Participants are then asked to rate how hard the symptoms have

made it for them to get along with others on a scale from 0 “not difficult at all” to 3 “extremely difficult. Scores for the PHQ-9 range from 0-27 with any scores 5 or higher indicating a diagnosis for depression. The questionnaire has demonstrated good internal reliability (Chronback’s alpha .86-.89, Milette, Hudson, & Baron, 2010; Kronke, Spitzer, & Williams, 2001) as well as test-retest reliability (.84, Kronke, Spitzer, & Williams, 2001; Konke, Spitzer, Williams, & Lowe, 2010). The reliability for the current sample was good (Cronbach’s alpha = .89).

Multidimensional Scale of Perceived Social Support (MSPSS). The MSPSS is a 12 item questionnaire that asks participants questions about the three different areas of social support in their lives (friends, family, and significant other). Participants are asked to rate how strongly they agree or disagree with statements on a 7-point likert scale, 1 is very strongly disagree and 7 is very strongly agree. Higher scores on the scale indicate higher levels of perceived social support. The MSPSS has good internal reliability ($\alpha = .88$) and test retest reliability ($r = .85$, Zimet et al, 1988). The internal reliability for the current sample was acceptable (Cronbach’s alpha = .78).

Generalized Anxiety Disorder-7 (GAD-7). The GAD-7 (Spitzer, Kroenke, Williams, & Lowe, 2006) is a 7 item questionnaire to assess for generalized anxiety disorder symptomology. Items for the GAD-7 are scored on a 4 point scale ranging from 0 (“Not at all”) to 3 (“Nearly Every Day”). Higher total scores indicate more generalized anxiety symptoms. Internal consistency is very good (Cronbach’s alpha = .92) and test-retest reliability is also very good (.83; Spitzer et al., 2006). The internal reliability for this sample was good (Cronbach’s alpha = .82).

Rivermead Post Concussion Questionnaire (RPQ). The RPQ is a 16 item questionnaire assessing symptoms often experienced after concussions. Participants are asked to compare their symptoms after injury to before injury. The questions are rated on a scale from 0 ("Not Experienced at all") to 4 ("A severe problem"). Higher scores on the questionnaire indicates more concussion symptoms. The questionnaire has good internal reliability (r = .87) and excellent test-retest reliability (r = .91; King, Crawford, Wendon, Moss, & Wade, 1995). The internal reliability for this sample was excellent (Cronbach's alpha = .974).

Schwartz Outcome Scale-10 (SOS-10). The SOS-10 is a 10 item scale assessing overall psychological well-being. Items are rated on a 7-point likert scale ranging from 0 ("Never") to 6 ("All or Nearly All The Time"). Higher scores on the SOS-10 indicate higher psychological well-being. The measure has excellent internal reliability (Chronback's alpha = .96) as well as good test-retest reliability (alpha = .87; Blais, et al., 1999). The reliablity for the current sample was excellent (Chronbach's alpha = .943).

Procedure

The participants were recruited through the online research participant pool, where students are allowed to volunteer for research studies to gain course credit. All participants indicated that they had read and understood the consent form prior to participating in the study. Participants completed questionnaires online. At the conclusion of the study, all participants were debriefed and resources were provided in the event that they experienced any uncomfortable emotions during the survey.

Results

Our results show no significant difference between the concussion group and the non-concussion group on any of our variables. Our first hypothesis, that an increase in concussions would be associated with increased depression symptoms was unsupported (r = .298, p = .124). Our second hypothesis, that more concussions would be associated with decreased feelings of social support was also unsupported (r = -.022 , p = .824). Due to the lack of support for the first two hypotheses, our final hypothesis – that concussions lead to depression through social support – was also unsupported.

Interestingly, exploratory analyses did show a significant relationship between depression and social support (r = -.307, p = .024). We also found a significant relationship between concussion symptom severity and anxiety symptoms (r = .416 p = .028), as well as between concussion symptoms severity and overall psychological health (r = -.426, p = .024).

Discussion

Our results did not support any of our hypotheses, likely due to our small sample size. There were several correlations that were approaching significance, and with a larger sample size may have been significant.

Our results support the vast amounts of literature suggesting a relationship between social support and depression (Shrebourn, Hayes, & Wells, 1995; Lara, Leader, & Klein, 1997; Zimet et al, 1988).. This shows that social support could still be important to consider in when investigating or treating depression after concussion, but this relationship should be examined further.

Our results showing the relationship between anxiety and concussions is an important implication for future studies. Because anxiety has a close link to depression, this could also show that with a larger sample size, and taking medication into account, our study could have found a significant outcome. Current literature has not focused on anxiety as it is related to concussions, and this study shows there may be a real relationship between the two that future research should study.

The relationship between overall psychological health and concussions also has serious implications and shows a possible breakdown in concussion protocols. Overall psychological health is something that should be considered in concussion protocols for overall health. If people are experiencing concussions, their mental health should not suffer as well. Doctor and sports psychologists should ensure that sufferers of concussions return to health physically as well as mentally.

There were many limitations to our study, with the size of our sample being the most important. Due to the low sample size the statistical power for the study was inadequate. Additionally, the sample was mostly Caucasian, and all of our participants were college students, which resulted in a very narrow age range. Furthermore, the self-report nature of the current study asking participants to describe past concussions and their experiences could have resulted in recall bias. However, this study was not limited to sampling athletes or veterans, which improves some on previous studies' generalizability.

Future research should continue to examine the relationship between concussions and depression with larger sample sizes. Future studies should attempt to study a more diverse sample including different races and ethnicities as well as a wider age range. Additionally,

research should also continue to examine social support as it relates to concussions and depression. Social support can impact overall health as well as depression. Research should examine the effects of concussions on overall psychological health, and possibly modify protocols to better address psychological health. Anxiety also appears to be linked to concussions, but future research should examine this relationship further.

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