

Returning to the Classroom Following Sport-Related Concussion: Perspectives of College Student Athletes

Amanda Acord-Vira¹
Reagan Curtis¹
Diana Davis¹
Steven Wheeler²

Abstract

The purpose of this study was to examine student athletes' perspectives regarding return to learn following sport-related concussion. Data were collected through an online survey from student athletes; a subset of whom had a history of concussion. Student athletes who reported receiving education regarding the effects of concussion on classroom performance were more likely to report a concussion and receive accommodations. Also, student athletes experiencing specific symptoms reported certain accommodations to be more or less beneficial with returning to the classroom following concussion. However, the presence of a return to learn policy at colleges did not improve the odds that student athletes received education on the effects of concussion on academic performance or improve concussion reporting or receiving accommodations while recovering from symptoms of concussion. Returning to the classroom prior to symptom resolution following concussion can have adverse effects on symptom recovery, learning, grades, and ultimately the livelihood of the student athletes. Colleges need to provide education specifically on the effects of concussion on classroom performance to increase the odds of student athletes reporting a suspected concussion to a school official. Student athletes who report a concussion are also more likely to receive accommodations when returning to the classroom that will enhance recovery without exacerbating symptoms.

Keywords: concussion, return to learn, postsecondary, college

Concussion is major public health concern in the United States. According to the Centers for Disease Control & Prevention (CDC), "a concussion is a type of traumatic brain injury - or TBI- caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move rapidly back and forth. This sudden movement can cause the brain to bounce around or twist in the skull, stretching and damaging the brain cells, and creating chemical changes in the brain" (CDC, 2015b, para. 1). Sport-related concussion (SRC) is a subtype of mild traumatic brain injury (mTBI) that affects approximately 1.6 million to 3.8 million individuals each year (Langlois, Rutland-Brown & Wald, 2006).

Concussion can alter brain function and affect memory and orientation (Giza et al., 2013; Harmon et al., 2013; McCrory et al., 2013a; West & Marion, 2014). Students who experience a concussion can report a variety of symptoms, some of which interfere

with learning. These symptoms may resolve quickly in a matter of days or can take weeks or months to recover (Wasserman, Bazarian, Mapstone, Block, & van Wijngaarden, 2016). Concussion symptoms that students experience can be classified into four categories: cognitive (e.g., thinking, memory, confusion, amnesia), physical (e.g., headache, dizziness, balance, sensory, nausea), emotional/mood (e.g., excess excitability or irritability, depression, anxiety), and sleep (e.g., insomnia, drowsiness; Brown, Elsass, Miller, Reed & Reneker, 2015; CDC, 2015a; Gessel, Fields, Collins, Dick, & Comstock, 2007).

Sport-related concussion has received a lot of attention over the last decade due to the public awareness campaigns and the long-term effects concussions can have on student athletes. Organizations such as the National Football League (NFL) and the National Collegiate Athletic Association (NCAA) have participated in the assessment, management, and prevention

¹ West Virginia University; ² University of Cincinnati

of SRC's, and also worked to increase awareness of the incidence and long-term effects of concussion (Bonds, Edwards, & Spradley, 2014). There continues to be inconsistencies across colleges and sport associations regarding best care approaches and management of student athletes who sustain a concussion as well as compliance with recommended approaches.

To promote best practice, the NCAA adopted a Concussion Policy and Legislation in 2010 that affects athletes who play in NCAA regulated sports at colleges (Baugh et al., 2014). Colleges sanctioned by the NCAA must implement a concussion management plan that includes education on the symptoms of concussion, a process for the evaluation and management for student athletes experiencing symptoms of a concussion, a return to play (RTP) protocol, and a medical clearance policy to return to athletics. In 2017, the "Interassociation Consensus: Diagnosis and Management of Sport-Related Concussion Guidelines" was released following the 2014 Safety in College Football Summit that expanded the list of requirements that colleges with students participating in NCAA sports must follow (NCAA Sport Science Institute, 2017, p. 3-4). These additional requirements include pre-participation baseline testing, procedures for reducing exposure, and education that includes a policy on return to learn (RTL).

Colleges have several opportunities for students to play a sport for either a varsity, club or intramural team. The most common sport associations for varsity include the NCAA, the National Junior College Athletic Association (NJCA), and the National Association of Intercollegiate Athletics (NAIA). The NCAA is the largest with approximately 1,200 institutions and 460,000 student athletes. The NJCA and the NAIA both cater to smaller schools with 2- and 4-year programs. Participation in club sports is quickly rising in popularity with an estimated two million college students playing some type of club sport (Pennington, 2008). Club sports are usually overseen by student activity associations which also oversee intramural sports on campus. Intramural or recreation leagues allow students to participate in a less organized team where students from the same institution play against each other. However, due to the lack of organization nationwide for club and intramural/recreation sports, concussion management guidelines are not always available, and these groups are not mandated to follow the concussion policy and management guidelines for students playing for varsity associations such as the NCAA.

A concussion management plan does not necessarily translate into adherence to the required components of that plan. Paddack and colleagues (2016)

surveyed 55 head athletic trainers at colleges in California and found a 25% compliance with pre-participation assessment or baseline testing and a 34.5% compliance with management guidelines. Lynall, Laudner, Mihalik, and Stanek (2013) surveyed 1053 members of the National Athletic Trainer's Association and also found that less than half of the participants indicated using a variety of objective methods for baseline testing. In addition, only 20.8% of athletic trainers reported using return to participation guidelines, physician recommendations, and player self-report to determine when a student athlete could return to participation after concussion. Carson and colleagues (2014) completed a retrospective electronic chart review at an office-based physician's office to determine if symptoms got worse when a student athlete returned to learn or play. The charts reviewed included elementary, high school, and college aged student athletes with elementary students requiring fewer days of rest before returning to activity. Despite the available guidelines and education for an SRC, 43.5% of athletes return to their sport too early and 44.7% return to the classroom before symptoms subside (Carson et al., 2014).

There is limited evidence for effective approaches on the amount and type of education to provide student athletes on SRC due to the wide variability of delivery, content, and source at postsecondary institutions (Kroshus & Baugh, 2016; Kroshus, Daneshvar, Baugh, Nowinski, & Cantu, 2014). Kroshus and Baugh (2016) surveyed athletic trainers ($n=490$) and student athletes ($n=318$) participating in NCAA sport to evaluate the content, source, and delivery of education materials on concussion to collegiate athletes. The athletic trainers were asked questions regarding the type of content pertaining to concussion that was delivered to athletes. Seventy percent of the athletic trainers indicated providing education to the student athletes on the impact of playing with a concussion on athletic performance, but only 43.5% provided education on general cognitive decline. However, 86.1% of student athletes reported they would like education on the impact of concussion on academic performance.

Return to Learn

Return to learn (RTL) is a protocol or policy that guides reintroduction of a student gradually into the classroom after sustaining a concussion. Paddack and colleagues (2016) found that only 31% of the athletic trainers surveyed reported having an academic accommodation policy established for student athletes who sustain a concussion. Returning to the classroom while still experiencing symptoms can have

negative effects on the student's ability to perform at pre-injury status and can affect grades and eligibility for play. RTL following a concussion should be of primary concern because of increased risk for long-term impairments with learning that can ultimately affect the student athlete's lifelong opportunities of careers and livelihood (Makdissi et al., 2013; Selsie et al., 2013; Yi, Padalino, Chin, Montenegro, & Cantu, 2013).

Returning to the classroom can cause excessive strain on the processes of the brain. The student should be monitored while using cognitive rest and classroom accommodations to decrease the likelihood of symptoms worsening. Cognitive rest is usually recommended for the first 24-48 hours after injury when symptoms are most severe, but further research is needed to determine the duration and type of cognitive rest that is warranted after concussion to maximize recovery (Giza et al., 2013; Hall et al., 2015; Harmon et al., 2013; McCrory et al., 2013b). Avoiding activities that increase symptoms and getting plenty of sleep helps brain cells to heal (McAvoy, 2012). Those activities (e.g., computer, phone, tablet, video games, television, reading, schoolwork) that require attention, memory, processing speed, and cognitive flexibility initially should be restricted and reintroduced slowly as symptoms and tolerance improves (Hall et al., 2015; Master, Gioia, Leddy, & Grady, 2012; Scorza, Raleigh, & O'Connor, 2012). Students who miss class are at risk of getting further behind, and the added stress and anxiety of being away from peers and trying to catch up once returning to class can worsen and prolong symptoms (Gibson, Nigrovic, O'Brien, & Meehan, 2013).

A RTL policy provides a process by which a student athlete gradually returns to the classroom while recovering from symptoms of concussion. Currently, there is no consistent process for RTL in the college classroom like there is for RTP (Harmon et al., 2013; Makdissi et al., 2013; West & Marion, 2014). Suggested progression of activity for RTL is similar to RTP guidelines with no activity, gradual reintroduction of cognitive activity, homework before schoolwork, school re-entry, gradual reintegration into academics, and resumption of normal cognitive workloads (Hall et al., 2015; Master et al., 2012). Student athletes should continue some level of cognitive rest without symptoms worsening before moving on to the next phase of cognitive activity (Baker et al., 2014).

A gradual return to cognitive activity can be achieved by providing student athletes with temporary classroom accommodations that allow the student to attend class and participate as tolerable, while

still obtaining all the material, and permit increased time to complete the assignments and exams. Possible accommodations include meetings with the instructor, excused absences from class, rest breaks, extension of assignment and test deadlines, extended testing time, accommodation for light and noise sensitivity (e.g., sunglasses, hats with visors, turn down lights, quiet location, limiting extra noises), removal from activities requiring physical participation, readers for assignments and tests, note taker and/or tutor, quiet exam rooms, and preferential seating (Hall et al., 2015; Halstead et al., 2013; Makdissi et al., 2013; McGrath, 2010; Moser, Glatts, & Schatz., 2012; Quinlin, Bates, & Angell 2012; Trammell & Hathaway, 2007). The amount and type of accommodations need to be flexible enough to ensure effectiveness (Hadley, 2005; Makdissi et al., 2013).

The accommodation process in place at most universities and colleges is not sufficient for concussion because symptoms typically resolve in a matter of weeks before the traditional accommodation can be completed. Because of the long timeline to implementation in the current accommodation process, students who want to receive accommodations for concussion must proceed without the support of disability services (Baker, Boland, & Nowik, 2012). If RTL policies are in place at colleges, academic professionals (e.g., academic supports/disability services, therapists, faculty, counselors), in conjunction with the physician, can assess the student athlete following concussion to develop a plan utilizing accommodations and services to optimize the student's classroom performance (Hadley, 2005). Short-term accommodations can be provided for the student to succeed immediately after the concussion until full recovery has occurred.

Rationale

The majority of the literature available on returning to activity following SRC is in the realm of returning to play (RTP) in comparison to returning to learn (RTL). While almost half of institutions indicate having a RTP policy at their institution, only 30% maintain that they follow the established concussion management policy at their institution for athletes following SRC (Paddack et al., 2016). The goal of a RTL policy is to establish a process the student athletes can follow and provide the tools (e.g., accommodations) necessary for resuming the role of student as compared to student athlete. In addition, there is limited evidence concerning the impact of SRC on academic performance and the use of accommodations to maximize performance. Student athletes requiring accommodations for school should not be allowed to

RTP (McAvoy, 2012) until they can fully return to cognitive activity.

The following research questions were addressed with an online survey completed by student athletes: (1) What are NCAA and non NCAA student athlete perspectives on current practices (e.g., RTL policy, education, baseline testing) with RTL following SRC; (2) What are student athletes' perspectives on returning to the classroom following an SRC; (3) Are student athletes who were aware of a RTL policy or who received education on the effects of concussion on academic performance more likely to report a concussion and receive accommodations while recovering from concussion symptoms; and (4) Are student athletes who experience a specific symptom as a result of an SRC more likely to report a particular accommodation as more or less important for returning to the classroom?

Methods

Survey Instrument

An online survey was developed to gain information from student athletes regarding RTL and the use of accommodations following concussion. The survey questions were based on previous studies that used similar types of questions and findings in the literature to increase reliability and validity. The survey included 16 multiple choice, two Likert type items, and two open-ended questions. The survey took approximately ten minutes to complete. Any participants who indicated they were not a student athlete were immediately exited from the survey. The survey consisted of three sections: demographics, current practices with RTL, and experiences of returning to the classroom following SRC. The RTL section was completed by all participants and contained questions on the presence of a RTL policy, education on effects of SRC on academic performance, and baseline testing. Only student athletes who reported sustaining a concussion completed the final section of the survey. This section included questions related to experiences of returning to the classroom (e.g., recovery time, missed class days, accommodations received).

Procedure

An IRB was submitted, and approval gained prior to selection of participants. The Carnegie Classification of Institutions of Higher Education is a framework for describing colleges in the United States in terms of diversity and identifying similarities or differences between institutions (The Carnegie Classification of Institutions of Higher Education, n.d.). Four hundred and seven colleges met the Carnegie Clas-

sification of Institutions of Higher Education with "very high undergraduate," "high undergraduate," or "majority undergraduate," and "four-year, full-time" and were selected to distribute the online survey to the student athletes at that college. These Carnegie Classifications were selected in order to maximize the number of undergraduates because the majority of student athletes participate at the undergraduate level (National Collegiate Athletic Association [NCAA], n.d.). Because the NCAA is the largest varsity sport association and is only available at four-year institutions, this was an important classification to consider for selection of postsecondary institutions. In addition, the NAIA is comprised of four-year colleges so including the NCAA and the NAIA should capture a majority of varsity sport athletes. However, club sports are more difficult to classify. Club sports can be found at any level of postsecondary institution and are governed by varying organizations across institutions. One similar characteristic between varsity and club sports is the requirement for academic eligibility. If a student performs poorly academically, they become ineligible to participate in sports. For this study, the guidelines used for NCAA sponsored sports was used to model the selection process of postsecondary institutions.

It is estimated that approximately 2.5 million student athletes participate in varsity and club sports at postsecondary institutions. This includes an estimated 460,000 NCAA students, 56,784 NAIA students, and 2 million club sport students that participate in sports at all postsecondary institutions annually. To maximize the potential of reaching a sample of student athletes at the selected postsecondary institutions, email addresses were gathered from the internet for athletic directors, club sports, and intramural/recreation leadership. The identified directors and leaders of the various sports were asked to send out the survey link and cover letter to student athletes at the institution. Reminder emails were sent twice following the initial contact.

Participants

A total of 237 college student athletes responded to an online survey. The records of 22 of the participants were removed due to not completing any additional questions after indicating they played a sport at the college level. One participant was eliminated due to not meeting the inclusion criteria. The remaining 214 participants met the inclusion criteria of being over the age of 18 and enrolled in a minimum of one credit hour at a college meeting the Carnegie Classification. The response rate was difficult to access due to the limited information available on the exact num-

ber of student athletes at each institution. Considering the number of institutions selected to participate and the number of student athletes completing the survey being less than the institutions, the response rate was considered to be lower than expected. Although the overall response rate was lower than expected, the student athletes with a history of concussion accounted for 15% of the overall response rate which is higher than the average concussion rate of 9% of NCAA student athletes.

Participants included 86 males and 128 females, and the ages ranged from 18 to 28 years of age with an average age of 20 years. The participants included freshman ($n=45$, 21.0%), sophomores ($n=59$, 27.6%), juniors ($n=49$, 22.9%), seniors ($n=49$; 22.9%), and graduate ($n=12$, 5.61%) students who participated in a sport ($n=213$) through either a club ($n=99$, 46.3%), NCAA ($n=97$, 45.3%), NAIA ($n=12$, 5.6%), or intramural/recreation sport ($n=5$, 2.3%). One student did not answer the question on sport association. The student athletes who reported sustaining a concussion ($n=31$), and who completed the survey, sustained one ($n=19$, 61.3%), two ($n=5$, 16.1%), or three or more ($n=7$, 22.6%) concussions while playing sports at the college level. These responses provided an avenue to investigate student athletes' perspectives on RTL guidelines, common symptoms experienced after SRC, and accommodations that may be important for returning to the classroom following an SRC.

Results

IBM SPSS 25 was used to analyze the data. Descriptive statistics and Fisher's Exact Test were calculated to investigate research question (1), what are NCAA and non-NCAA student athlete perspectives on current practices (e.g., RTL policy, education, baseline testing) with RTL following SCR? Student athletes ($n=214$) were surveyed and 78 (36.4%) were aware of an available RTL policy, 91 (42.5%) received education on the effects of SRC on academic performance, and 99 received baseline testing (46.3%). NCAA student athletes ($n=97$, 45.3%) were compared to non-NCAA (e.g., club, intramural/recreation, NAIA) sport athletes ($n=116$, 54.5%) to further describe current trends with RTL. An odds ratio was computed to determine the size of the effect of knowing or not knowing whether the postsecondary institution had a return to learn policy and whether the student did or did not report a concussion, receive education, and receive accommodations. For NCAA student athletes, the odds of reporting awareness of an RTL policy were 4 times (95%; CI: 2.21, 7.23) the odds of reporting awareness of receiving education on

the effects of SRC on academic performance were 2.91 times (95%; CI: 1.66, 5.12), and the odds of reporting receiving baseline testing were 6.72 times (95%; CI: 3.68, 12.27) that of non-NCAA sport athletes.

The remaining research questions were assessed without comparison between sport associations due to the low response rate of student athletes reporting a history of concussion: NCAA ($n=9$, 29%), NAIA ($n=1$, 3.2%), club ($n=19$, 61.3%), intramural/recreation ($n=2$, 6.5%). Descriptive statistics were calculated to investigate research question (2), what are student athletes' perspectives on returning to the classroom following an SRC? The student athletes who indicated a history of concussion ($n=31$, 14.5%) were surveyed about reporting of concussion symptoms and receiving classroom accommodations. The highest percentage of physical symptoms experienced by student athletes following SRC included headaches ($n=31$, 100%), dizziness ($n=27$, 87.1%), sensitivity to light ($n=25$, 80.6%), and feeling slowed ($n=24$, 77.4%). Over 70% of the student athletes experienced symptoms in all areas of cognition including difficulty concentrating ($n=25$, 80.6%), mentally foggy ($n=24$, 77.4%), and difficulty remembering ($n=22$, 71%). Table 1 displays frequency and percentages of all symptoms reported by the participants following their most recent concussion and the median level of severity on a five-point scale.

Twenty-three (74%) student athletes with a history of concussion reported symptoms to at least one or more of the following individuals: coach ($n=17$, 54.8%), family ($n=15$, 48.4%), physician ($n=15$, 48.4%), athletic trainer ($n=14$, 45.2%), teammate ($n=11$, 35.5%), faculty ($n=9$, 29.0%), or academic support/disability office ($n=1$, 3.2%). Twenty-eight student athletes (90%) reported a recovery period of more than one day, but nineteen (61.3%) participants did not miss any days of class. Concerning accommodations, 48% of the student athletes reported using accommodations while recovering from concussion. The most common classroom accommodations used after SRC were excused absences ($n=11$, 35.5%) and extension of tests and assignments ($n=9$, 29%). See Table 2 for more details on reported recovery time, days missed from school, and the availability and types of accommodations provided during their recovery following concussion.

Fisher's Exact Tests and odds ratios were calculated to investigate research question (3), are student athletes who were aware of a RTL policy or received education on the effects of concussion on academic performance more likely to report a concussion and receive accommodations while recovering from concussion symptoms? A 2x2 contingency table was

used with all variables as “Yes” or “No” for each comparison. Fisher’s Exact Test confirmed that students with a history of concussion who are aware of a RTL policy at their institution were not significantly ($p>.05$) more likely to be aware of receiving education on concussion, report a concussion, or receive accommodations than student athletes with a history of concussion who do not report having a RTL policy. However, further analyses on the education component of the RTL policy confirmed that students receiving education on the impact of concussion on academic performance prior to the start of the season were significantly ($p<.05$) more likely to report a concussion and receive accommodations than students who did not receive the same education. For student athletes with a history of concussion, the odds of receiving education on the impact of concussion on academic performance were 22.5 times (95%; CI: 2.32, 218.35) that of student athletes who did not receive education to use accommodations and 1.62 times (95%; CI: 1.16, 2.26) that of student athletes who did not receive education to report a concussion.

The Fisher’s Exact Test and odds ratios were used to assess research question (4), are student athletes who experience a specific symptom as a result of an SRC more likely to report an accommodation as more or less important for returning to the classroom? As one might expect, odds ratios for statistically significant ($p<.05$) revealed that students who experienced fatigue were 7 times (95%; CI: 1.36, 35.93) that of student athletes who did not experience fatigue to report that a reader or note taker would be a valuable accommodation and student athletes reporting trouble falling asleep were 7.6 times (95%; CI: 1.07, 54.09) that of student athletes who did not experience trouble falling asleep to report preferential seating as an important accommodation for returning to the classroom. Conversely, students who experienced headaches were 1.4 times (95%; CI: 1.01, 1.95) that of student athletes who did not experience a headache to report an excused absence as not important as an accommodation to return to the classroom. Students with vision problems were 2.9 times (95%; CI: 1.70, 4.90) that of student athletes who did not experience vision problems to report rest breaks as not important as an accommodation to return to the classroom and students feeling more emotional were 9.5 times (95%; CI: 1.27, 71.43) that of student athletes not experience feeling more emotional to report wearing sunglasses or decreasing lighting as not important as an accommodation to return to the classroom. Lastly, students sleeping more than usual were 1.4 times (95%; CI: 0.21, 9.35) that of student athletes not experiencing sleeping more than usual to report preferential seating as

not important for managing symptoms to return to the classroom following SRC.

Discussion

Despite the advances made in the assessment and management of SRC, there is limited research regarding student athletes’ academic experiences during the recovery period. The purpose of this study was to examine student athletes’ perspectives of RTL following SRC. Less than half of the student athletes surveyed reported awareness or knowledge of several key components of a concussion management policy. However, student athletes who participated in NCAA sanctioned sports were more likely to be aware of a RTL policy, receive education on the effects of concussion on academic performance, and participate in baseline testing. In addition, NCAA athletes were less likely to report history of a concussion than students who participated in a club sport. Further research is warranted to determine if the differences between NCAA and club athletes is due to the effectiveness of the NCAA’s concussion management plan.

Despite the growing trend for colleges to adopt a RTL policy or classroom guidelines for learning after concussion, in this study only one-third of student athletes reported being aware of a RTL policy at their institution. This is consistent with the findings by Paddock and colleagues (2016), in which only 31% of athletic trainers surveyed had academic accommodation policies for SRC at the institutions they worked. This finding is problematic because many student athletes are attending colleges that may not have a RTL policy to follow after sustaining an SRC. Even if the college has a policy, student athletes may not be aware of the policy or may not be compliant with the recommendations in spite of their awareness.

Student athletes with a history of concussion who were aware of a RTL policy at their institution were not more likely than students who were not aware of a RTL policy to receive education on the impact of concussion on academic performance, report a concussion, or receive accommodations while recovering. Simply having a RTL policy that addresses returning to the classroom following concussion does not necessarily improve the knowledge or experiences of student athletes who sustain a concussion. Since 44.7% of student athletes with a concussion return to the classroom before symptoms subside (Carson et al., 2014), the goal should be to provide information on the existence and purpose of a RTL policy. This includes education on the impact of concussion on classroom performance and awareness of resources available following concussion.

A concussion management policy should include education for student athletes. Kroshus and Baugh (2016) found that 80% of students surveyed reported receiving some form of education on concussion in general from colleges. However, individual institutions determine the amount and content of the education material provided to student athletes. Institutions may or may not choose to cover content regarding the effects of concussion on academic performance. In this study, only 43% of student athletes reported receiving education specifically on the impact of SRC on academic performance. Kroshus and Baugh (2016) found that 86% of student athletes reported wanting more education on the impact of concussion on academic performance.

A RTL policy should specify how specific education on the effects of concussion on academic performance will be developed and implemented to improve awareness. Student athletes who indicated that they had received education on the effects of concussion on academic performance were more likely to report a concussion and more likely to receive accommodations. Findings from the current study support the benefits of equipping students with knowledge of the consequences of concussion on academic performance. A supportive environment and concussion knowledge for collegiate athletes may facilitate reporting symptoms to school professionals and requesting appropriate accommodations that can promote RTL.

Most of the literature available has focused on RTP, not on returning to the classroom following concussion. In this study, over 80% of the student athletes with a history of concussion reported a recovery time of less than 2 weeks. In addition, 61% of student athletes reported missing zero days of school. Student athletes may be returning to the classroom prior to their symptoms resolving. This could have negative effects on their ability to learn, their grades, and the length of recovery. The majority of student athletes in the current study indicated difficulty concentrating and remembering as a result of concussion. Even though students reported symptoms for weeks and still attended class, less than half received any accommodations.

A graduated plan with appropriate accommodations to return students to the classroom should promote recovery and provide opportunities for learning simultaneously. Accommodations need to be individualized to the student's specific needs based on the types of symptoms experienced during the recovery period and the type of college courses enrolled. The most common accommodations received by over 30% of student athletes in this study were excused absences

and extensions for tests and assignments. This is consistent with Paddock and colleagues (2016), who found that the two most common accommodations provided by colleges were excused absences and extended learning time.

There are several recommended accommodations in the literature for student athletes returning to the classroom following an SRCs (Hall et al., 2015; Halstead et al., 2013; Makdissi et al., 2013; McGrath, 2010; Moser et al., 2012; Quinlin et al., 2012; Trammell & Hathaway, 2007). However, there is limited research on benefits or importance of these accommodations from college athletes' perspectives. In an ideal situation, students who report a specific symptom will then receive an accommodation that is beneficial for managing that symptom upon returning to the classroom.

Students reporting fatigue were more likely to perceive a reader or note taker as an important accommodation for returning to the classroom. The demands of returning to the classroom are complex and require students to be able to multitask (e.g., listen while taking notes). Engaging in multiple activities may increase fatigue and interfere with their ability to fully participate in school related activities (Birgitta & Lars, 2017) and the use of a notetaker or reader will decrease the amount of multitasking required of a student in the classroom setting.

Approximately 50% of student athletes with a history of concussion in this study reported having trouble falling asleep or sleeping more than usual. Sleep disturbances following SRC can have an impact on symptom reporting and cognitive functioning (Kostyun, Milewski, Hafeez, 2014; McClure, Zuckerman, Gregory, Kutscher, & Solomon, 2013; Mihalik et al., 2013). Sleep is often assessed through self-reporting of hours slept and quality of sleep. Sleep disturbances can increase symptom reporting as well as recovery time. Student athletes in this study who reported difficulties with sleeping perceived the accommodation of preferential seating as important for the symptom of having trouble falling asleep and unimportant for sleeping more than usual. Preferential seating (e.g., sitting closer to the instructor, sitting away from distractions; close/farther away sensory items in the room; Byrnes, 2008) may promote learning for students experiencing sleep disturbances.

Headaches are one of the most common symptoms of concussion and experienced by all student athletes in this study. Student athletes reported that excused absences were not an important accommodation for recovery of concussion, which is evident by the majority of students not missing any days. As one student reported, "It was hard to miss class

and have to catch up when coming back.” Gibson and colleagues (2013) found that the fear of getting behind by missing class could worsen and prolong symptoms. As research on cognitive rest progresses, students may require education on the benefits of limited excused absences to manage symptoms.

Vision and emotion symptoms also affected a sizable portion of student athletes following an SRC in this study. There was an association between students reporting visual problems and the accommodation of rest breaks. Simply providing a rest break was reported as not an important accommodation for student athletes to return to the classroom. Also, students reporting more emotional distress after the concussion felt that lowering the lighting or wearing sunglasses would not be helpful for returning to the classroom. Students who experience emotional problems in combination with decreased visual memory may be more likely to use avoidance coping (Covassin, Elbin, Crutcher, Burkhart, & Kontos, 2013). Avoidance coping is when an individual tries to escape or ignore a problem or unwanted situation. However, in the long-term, avoidance coping is associated with higher levels of psychological distress and poor adjustment (Wood & Doughty, 2013). In this study, over 50% of participants indicated feeling more emotional after their concussion. There is little literature on specific accommodations that can be used to address visual and emotional symptoms in the classroom following SRC. Further research and analysis identifying appropriate accommodations for visual (e.g., inability to focus, double vision, visually alternate between or follow objects; Master et al., 2016) and emotional symptoms will allow students to engage in learning while maximizing performance without worsening symptoms.

Implications for Practice

There is a lack of awareness among many student athletes regarding RTL policies. The purpose of a RTL policy is to provide students with knowledge of what to do after experiencing an SRC, how and to whom to report an SRC, and how to seek assistance when returning to the classroom. The majority of student athletes in this study were unaware whether a RTL policy at their institution was available to help them navigate the process of recovering from concussion. Even when students were aware of a RTL policy, it appeared that the presence of such a policy had little effect on student behavior (e.g., reporting and pursuing appropriate accommodations) unless the policy included education on the impact of SRC on classroom performance. The NCAA's concussion management plan appears to be increasing awareness

of policies and services available by student athletes. In addition, NCAA student athletes reported lower incidence of SRC than club sports. Sport associations that currently do not have RTL policy, either because they are not required to do so or are not in compliance, should consider developing and implementing RTL policy that includes education for student athletes about the effects of concussion on academic performance. Implementing RTL policy may decrease the effects that concussion has on learning, grades (e.g., lower GPA, failing), and future goals (e.g., unable to attend graduate school or professional program due to low GPA, inability to finish school due to failing a course).

Concussion education is significantly associated with students reporting and receiving accommodations following SRC. Colleges should provide concussion education prior to the beginning of the sport season to increase the odds of student athletes reporting a suspected concussion to a school official. Only when student athletes report a suspected concussion can academic professionals provide necessary services and supports that will enhance recovery from concussion. Student athletes in this study perceived several accommodations as important or not important for their returning to the classroom after experiencing a specific symptom of concussion. Obtaining classroom accommodations can be time intensive and complicated, resulting in accommodations not being available until after concussion symptoms have resolved. A process for obtaining short-term accommodations following a diagnosis of concussion should be implemented with a RTL policy at all colleges, as this would be helpful to both athletes and non-athletes.

College faculty and staff have an obligation to assist student athletes with understanding and following the institution's RTL policy. Collaboration is needed between the Office of Disability Services and other academic professionals (e.g., faculty, occupational therapist, advisor), who are experts in learning, to develop a checklist of symptoms that correspond to appropriate accommodations to simplify the process and ensure students are receiving only the accommodations that are essential for learning when returning to the classroom. School professionals would use the checklist when a student athlete reported a concussion to determine the appropriate accommodations to use for the gradual return to the classroom. More research is needed to inform the creation of this checklist.

To decrease the incidence of concussion, one would need a prevention plan in addition to a management plan. So, perhaps future research should focus on investigating concussion prevention and management plans. In addition, future research

should assess perceived benefits of accommodations for specific symptoms on a larger scale and with objective measures in addition to self-report of student athletes recovering from concussion. This will assist with the development of short-term accommodations that would be beneficial for returning to the classroom while managing continuing symptoms. Finally, future studies should assess the amount and types of education that should be provided to appropriate school officials on the symptoms of concussion and best practice approaches for management of SRC.

Limitations

Only student athletes representing colleges in the Carnegie Classification of Institutions of Higher Education with “very high undergraduate,” “high undergraduate,” or “majority undergraduate,” and “four-year, full-time students” participated in this study. These institutions were selected because they enroll predominantly undergraduate students who are eligible to play sanctioned sports. However, this is a limitation because the results may not be generalizable to other classifications of postsecondary institutions. This study had a low response rate that may be due to the timing of the survey delivery (e.g., summer session, during busy times of semester) and lack of interest in participation by students and institutions (e.g., schools not wishing to participate due to topic, no time, too many survey requests, perceived legal risk). This study used self-report of student athletes rather than objective measures of performance (e.g., learning, grades) to evaluate accommodations assumed to be beneficial for returning to the classroom.

Conclusion

When student athletes return to the classroom too soon following concussion, they may experience any of a number of negative consequences. These include prolonged symptom recovery, difficulty learning, and lower grades. While there has been considerable attention on athletes RTP, there has been limited research regarding student athletes RTL following sports-related concussion. RTP and RTL policies following a diagnosis of concussion should include education on the effects of concussion. In the study reported here, education was found to be significantly related to the odds of reporting and using accommodations after concussion. Having only a policy on RTL that does not include education was not associated with the odds of reporting a concussion or using accommodations. A graduated plan for returning to the classroom following concussion can enhance student athletes’ recovery and assist their ac-

ademic performance. A major component of a graduated plan is provision of short-term accommodations during recovery. Short-term accommodations may include classroom modifications (e.g., accommodation for light and noise sensitivity, removal from activities requiring physical participation, quiet exam rooms, preferential seating), assistance from others (e.g., meetings with instructor, tutor, readers and note takers for tests and assignments), time extensions for testing and assignments, rest breaks, and excused absences (Hall et al., 2015; Halstead et al., 2013; Makdissi et al., 2013; McGrath, 2010; Moser et al., 2012; Quinlin et al., 2012; Trammell & Hathaway, 2007). A concussion can have negative effects on student athletes’ learning and classroom success. Implementing policies that include graduated plans with accommodations that promote recovery is essential for student athletes to continue to learn and succeed in the classroom as symptoms subside.

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About the Authors

Amanda Acord-Vira received her MOT degree in occupational therapy and Ed.D. in educational psychology from West Virginia University. She also obtained her graduate certificate in special education and traumatic brain injury from George Washington University. Her experience includes over 15 years working with individuals following acquired and traumatic brain injury through clinical practice, research, and education. She is currently an associate professor in the Division of Occupational Therapy at West Virginia University. Her research interests include return to community participation, work, school, and functional activity following brain injury. She can be reached by email at: sacordvira@hsc.wvu.edu.

Reagan Curtis received his B.A. in psychology and Ph.D. in educational psychology from the University of California, Santa Barbara. He is professor of educational psychology and chair of the Department of Learning Sciences & Human Development at West Virginia University. He pursues a diverse research agenda in (a) the development of mathematical and scientific knowledge across the lifespan, (b) on-line delivery methods and pedagogical approaches to university instruction, and (c) research methodology, program evaluation, and data analysis (qualitative, quantitative, and mixed methodological) for studies in developmental, educational, health sciences, and counseling contexts.

Diana Davis received her B.A. degree in occupational therapy from Western Michigan University and Ph.D. in Interdisciplinary Education from West Virginia University. Her experience includes working as an occupational therapist for over 20 years serving clients with brain injuries. She is currently an associate professor in the Division of Occupational Therapy at West Virginia University. Her research interests include return to occupational performance and participation following brain injury. She can be reached by email at: dmdavis@hsc.wvu.edu.

Steven Wheeler received his BSc degree in occupational therapy from the University of Western Ontario, his M.Ed. from the University of Toronto and his Ph.D. from Virginia Commonwealth University. His experience includes over twenty years of occupational therapy consultation and practice in brain injury rehabilitation in both hospital and community settings. He is currently a professor and program director of occupational therapy at the University of Cincinnati. His research interests include community reintegration following traumatic brain injury, rehabilitation of executive cognitive functions, and occupation based assessment and intervention. He can be reached by email at: steven.wheeler@uc.edu.

Table 1

Severity of Symptoms Reported by Participants Following SRC (n=31)

	Frequency	Percent	Median
Physical			
Headache	31	100	3
Dizziness	27	87	2
Sensitivity to Light	25	80	2
Feeling Slowed	24	77	2
Fatigue	22	71	3
Sensitivity to Noise	22	71	3
Balance Problems	20	64	1
Visual Problems	18	58	2
Nausea	17	54	2
Numbness/Tingling	11	35	1
Vomiting	8	25	1
Cognitive			
Difficulty	25	80	3
Mentally Foggy	24	77	3
Difficulty Remembering	22	71	2
Emotional			
Irritability	21	67	1
Sadness	17	54	1
Feeling More Emotion	17	54	2
Nervousness	15	48	1
Sleep			
Drowsiness	21	67	2
Trouble Falling Asleep	18	58	2
Sleeping More Than Usual	14	45	2
Sleeping Less Than Usual	12	38	1

Note. 0=did not experience symptom, 1=barely noticed symptom, 2=clearly noticed, but could behave normally, 3=symptom bad enough to make normal behavior difficult, 4=symptom bad enough to make normal behavior impossible; Symptoms based off the Post Concussion Symptom Scale.

Table 2

Student's Experiences of Returning to the Classroom Following Concussion (n=31)

	Frequency	Percent
Recovery Time		
1 day or less	3	10
2-5 days	10	32
5-6 days	6	19
1-2 weeks	8	26
3-4 weeks	2	7
More than 1 month	2	7
Missed Class		
0 days	19	61
1-3 days	8	26
4-6 days	2	7
1-2 weeks	2	7
3-4 weeks	0	0
More than 1 month	0	0
Accommodations Received		
Excused Absences	11	36
Rest Breaks	4	13
Extensions Tests/Assignments	9	29
Extended Time for Tests	1	3
Sunglasses/Reduced Lighting	1	3
Quiet Room	0	0
Reader/ Note Taker	1	3
Preferential Seating	0	0
Tutor	1	3

Note. Recovery Time=the number of days the student athlete reported before being symptom free following concussion; Missed Class=the number of days student athletes did not attend class due to the concussion; Accommodations Received=the type of accommodation the student athlete utilized while recovering from concussion.