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Knowledge and Willingness of Academic Advisors and College Professors Regarding Concussion and Academic Accommodations

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KNOWLEDGE AND WILLINGNESS OF ACADEMIC ADVISORS AND COLLEGE PROFESSORS REGARDING CONCUSSION AND ACADEMIC ACCOMMODATIONS

by

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(Under the Direction of Tamerah Hunt)

ABSTRACT

Introduction: A significant increase in the number of concussions has guided research to look beyond physical return to play but rather examine cognitive return to learn as an all-inclusive approach to concussion management. Part of the return to learn protocol incorporates academic accommodations within the classroom, which can be implemented by academic advisors and professors. However, their knowledge and willingness of this role is unclear. **Purpose**: To determine academic advisors and college professor's knowledge of concussions and their willingness to provide academic accommodations to students recovering from a concussion. **Hypothesis:** H_1: Academic advisors and professors have a low level of concussion knowledge. H_2: There is a positive relationship between level of knowledge and willingness to provide academic accommodations. H_{3a}: Participants in the health and education disciplines will be more willing to provide academic accommodations. **Methods:** Academic advisors and professors from Georgia Southern University were recruited for the study. Participants completed a survey to determine their knowledge of concussion and their willingness to provide academic accommodations to students with concussions. **Data Analysis:** A one-way ANOVA was calculated to determine the level of concussion knowledge academic advisors and professors have. Multiple Pearson correlations were examined to determine the relationship between knowledge and willingness. A MANOVA was calculated to examine interactions and main

effects between discipline and academic rankings with regard to concussion knowledge and willingness. **Results:** A total of 240 participants completed valid surveys. No statistically significant difference existed between academic advisors and professor's concussion knowledge. Mean values for concussion knowledge in academic advisors was 76.8% correct and professors was 75.8% correct. Only one correlation showed a significant relationship between concussion knowledge and willingness to provide academic accommodations ($r = .136$, $p = .035$), while the rest did not. A MANOVA revealed a significant main effect for academic discipline and willingness [($F_{(16,224)} = 2.38$, $p = .002$) $e^2 = .078$], however, post hoc calculations determined it was due to a type 1 error ($p > .05$). **Discussion:** Academic advisors and college professors possess basic concussion knowledge and are willing to provide academic accommodations regardless of any external factors. While previous literature indicated factors such as job title, discipline and education would impact concussion management, the current study found this did not matter. This is crucial as it is imperative students receive appropriate care during the return to learn process. Further evaluation is necessary to determine if this population can appropriately implement academic accommodations on an individual basis.

INDEX WORDS: Return to learn, Classroom management, School personnel, Faculty, Mild traumatic brain injury

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CHAPTER 1

INTRODUCTION

Concussions, also known as mild traumatic brain injuries, are a growing topic of discussion as more people are participating in all levels of sports, increasing occurrence rates.[1] In 2014, the National Athletic Trainers Association provided a position statement defining concussion as "a traumatic induced alteration in mental status that may or may not involve a loss of consciousness." [2] According to Langlois (2006), approximately 1.6-3.8 million sports related concussions occur each year. Sport related concussions are the second leading cause of mild traumatic brain injuries in ages 15-24, which largely consist of the college aged.[2] Symptoms of concussion can include, but are not limited to, somatic, cognitive, and/or emotional symptoms, all of which can affect the athletes activities of daily living and academic scholastics.[3] Resolution of concussion symptoms within this population typically occurs within the first seven to ten days of injury.[4] Upon complete resolution of symptoms, athletes are able to begin the process to return to play (RTP) which has been managed through legislative groups.

Ample amounts of research have focused on return to play after concussion injury to ensure athlete's safety, as pre-mature return can be detrimental to an athlete's health. With monumental focus on return to play guidelines, in 2010 the NCAA mandated NCAA institutions at all three levels to develop and maintain policies for the identification and management of student athletes with concussions.[5] While this legislation is important, the guidelines incorporate more than just return to play as concussion management also encompasses return to learn (RTL), which are guidelines for a gradual return to the academic environment. As of 2009, all 50 states had state laws on return to play, however, in 2016 only 8 states had established RTL laws, all of which had varying aspects mainly focusing on student athletes rather than the general

population.[6] A study conducted by Kerr et al., 2015, found that RTL policies were only implemented in 207 out of 327 (63%) of NCAA universities studied, with only 3.1% of those addressing academic support to help manage concussed athletes. Despite the lack of academic support provided to students completing the RTL transition, it is paramount for their concussion recovery and academic success.

Concussion management has increased through the implementation of RTL polices, however these policies may only be beneficial if those responsible for implementing them understand concussive injuries and the importance of RTL. Concussion education is an annual occurrence that typically encompasses recognition of signs and symptoms, evaluation, effects of concussion, return to play. Those who receive this education are mainly parents, coaches, and athletes often times excluding school personnel such as teachers, professors, guidance counselors and academic advisors. Education for school personnel should be similar but have a focus on concussion and their effects as well as each professional's role in the management process of a concussion injury.[7] Due to the lack of education provided to school personnel, it is unknown how much knowledge they have regarding concussion and RTL. With no understanding of their knowledge, there is no way to determine if students with concussive injuries are receiving the appropriate RTL care. Therefore, it is important to gain an understanding of what knowledge school personnel do have with minimal concussion education.

Minimal research has been conducted in regard to teacher's knowledge of concussion. One study found that only 4.6% of educators from varying levels felt extremely confident and 17% felt very confident in concussion knowledge. The same study revealed that only 12.4% of educators felt very knowledgeable in concussion symptoms.[8] Similarly, Graft and Caperell (2016) completed a study in which teachers were given a pretest, a 20-minute concussion

education session, and a posttest. Results showed a deficit in concussion knowledge at pretest that was significantly increased on the posttest after the concussion education. These studies provide evidence that teachers lack concussion knowledge which can be increased through proper concussion education. It is evident that the RTL process is important in concussion recovery; therefore, it is important to understand the protocols' components.

The RTL process is a key component in providing students with an effective way to maintain academic responsibilities until symptom resolution occurs. This process begins in the acute concussion management phase and mostly involves cognitive rest. Cognitive rest has been defined as limiting exertion with activities of daily living and academic scholastics while experiencing symptoms.[9] This is best achieved through maintaining an individual's sub-symptom threshold, outlined by only allowing cognitive activity that does not trigger symptoms to increase or reoccur.[10] Maintaining a concussed individual's sub-symptom threshold can be particularly problematic upon initially returning to the classroom. Students may still be experiencing physical, cognitive, and/or emotional challenges which may be exacerbated if cognitive activity is progressed to quickly in the academic setting. This concern can be controlled through using a gradual RTL incorporating a slow increase in cognitive activity as the brain recovers from injury. A gradual RTL has been shown to be more beneficial than a full reintegration because rapid immersion during concussion recovery can exacerbate symptoms potentially prolonging symptom resolution.[10]

The gradual approach has been described as an initial period of cognitive rest, followed by light cognitive rest, return to school part time with accommodations, increased school attendance with decreased accommodations, and a full return to school with no accommodations.[11] Typically, this process is 5 or 6 stages, ranging from 2-14 days depending

upon the protocol (Hunt, 2016). Increased knowledge of RTL management has led to the development of several RTL guidelines. Protocols such as the Parachute program, Return to School protocol (RTS), and a 5-step protocol used at the United States Air Force Academy have implemented guidelines mimicking the philosophy of a gradual return to the classroom.[12–14] Development of these protocols has been crucial to the progression of concussion management; however, their benefits may be limited at the post-secondary level if those responsible for providing care and support are unaware of the polices. School personnel such as academic advisors or professors are often those responsible for implementing reasonable academic accommodations and managing students' full integration back into the classroom at the collegiate level.

Academic advisors and professors must have a good understanding of the gradual RTL protocol to help ensure the proper implementation of academic accommodations for students recovering from a concussion. Typically, academic accommodations are provided to students with learning disabilities, however, they are equally valuable to students with a concussion. The American Medical Society of Sports Medicine has defined appropriate academic accommodations provided during concussion recovery as reducing workload, extended test time, days off or a shortened work day.[15] Academic accommodations are provided to offer support to the recovering student in maintaining academic demands in a way that does not stress cognitive functioning and worsen symptoms.[3] Common accommodations that are utilized in the K-12 and collegiate setting for concussed students include but are not limited to: excused absence from classes, rest periods during the day, assignment extensions, postponement of tests, extended test time, accommodations for sensitivity to light or noise, excusal from physical activities, allowing a note taker, and alternate formats of assignments.[3] For most students, accommodations are only

temporary as their symptoms resolve within 7-10 days, however, this may not always be the case. Those experiencing prolonged concussion symptoms may need more long-term accommodations, requiring even more support from advisors and professors.

Students needing academic accommodations are able to seek this help through federal laws mandating accommodations be given. One mandate that is accessible in the K-12 setting is the Individuals with Disability Education Act of 2004 (IDEA) which is a federal law governing special education services in the US.[16] Under this law is the ability to request individualized educational plans (IEP) allowing free and appropriate education to students ages 3-21 years old with disabilities affecting their educational performance.[15] Another mandate is Section 504 of the Rehabilitation Act of 1973 which is a civil rights act protecting individuals with disabilities to receive equal opportunities.[15,17] Section 504 is mandated in any school or institution that is federally funded, and is implemented to provide a legally binding document for those with disabilities to receive reasonable accommodations.[17] 504 plans can be utilized in the K-12 setting as well as the collegiate setting, compared to IEP's which are only used in the K-12 setting.[18] In the collegiate setting, students are referred to disability services in order to obtain academic accommodations, however they are typically utilized when long term accommodations are necessary due to prolonged symptoms from a disabling condition. This leaves academic advisors and professors in the role of taking responsibility to provide accommodations.[13] Academic advisors and professors play a major role in helping provide this assistance to those recovering from concussions who are in need of academic support. Educators have a direct connection with the students' education, therefore, it is important for them to understand the effects of a concussion and how they can assist in concussion recovery by reducing cognitive demands.[19-18] Despite the direct connection, educators may be unaware of this responsibility and how to

provide assistance during this process. This lack of awareness may directly impact an educator's willingness to provide academic accommodations for those recovering from a concussion injury.

With academic advisors and professor's involvement in the implementation of academic accommodations, it is important to know if they are willing to make such adjustments. Research examining professor's willingness found several factors that influence a professor's willingness to provide academic accommodations to those with learning disabilities. Influences include age, discipline, teaching experience, highest degree earned and rank.[20] In this study, older faculty were more willing than younger faculty and those in an educational discipline were more willing than professors in other disciplines to provide academic accommodations.[20] Despite the influential factors, professors who had a greater understanding of the academic accommodations and their necessity for student education, was positively related to professor willingness. Faculty willingness to provide accommodations is not widely researched in regard to concussion, but it is possible that these patterns may carry over. Without further research their willingness remains unknown, however, educators who are willingness to provide assistance will provide a more optimal environment for those recovering from a concussion.

Concussion occurrence rates have drastically increased leading to the examination of concussion management. Existing research regarding concussion management has primarily focused on return to play, with little reference to RTL. Emphasis on RTL is slowly gaining significance with knowledge about the importance of cognitive rest and a gradual return to the classroom. RTL polices are slowly being incorporated into school settings, however few of them have been implemented in the collegiate setting. While it is beneficial having RTL guidelines, they do not necessarily promote academic support for the recovering student. If those responsible for implementing academic accommodations are unaware of the importance of accommodations,

their role in providing academic support, or are unwilling or uncomfortable providing them, the policy's benefits are limited. Gaining an understanding of the familiarity that academic advisors' and college professors have regarding concussion management in the classroom, could allow for adjustments in educational plans needed to provide a smoother transition to the classroom for recovering students. Therefore, the purpose of this study is to determine academic advisors and college professors' knowledge of concussion and the return to learn process, as well as their willingness to provide academic accommodations to students recovering from a concussion. It was hypothesized that 1) academic advisors and professors have a low level of concussion knowledge, 2) there will be a positive relationship between level of concussion knowledge and willingness to provide academic accommodations, and 3) participants from the health and education disciplines will be more willing to provide academic accommodations.

CHAPTER TWO

REVIEW OF LITERATURE

Concussion

Concussions, also known as mild traumatic brain injuries (mTBI), have become a growing topic of discussion leading to an abundance of research analyzing identification and management. From the 1970s, concussions have been classified into two types, those occurring from sport related incidents and those occurring from other instances such as motor vehicle accidents.[21] While both are classified as concussions, sport related concussions have taken precedent due to sport affiliations needing clear guidelines for management regarding returning athletes to participation.[21] In addition to concussions having different types, there are also a number of different definitions that have been used to describe the complexity of a concussion.

In 2001, the first international conference on concussion in sport was held, in which a consensus statement was developed providing recommendations to improve the evaluation and treatment of concussive injuries.[22] At this time, a sport related concussion (SRC) was defined as, "a complex pathophysiological process affecting the brain induced by biomechanical forces." [22] The definition continues, presenting common features associated with defining the nature of a sport related concussion. These features include: 1) a SRC can be caused by a direct blow to the head, face, neck or the body 2) SRC can results in rapid onset of temporary impairment regarding neurological function 3) SRC may result in neuropathological changes, however signs and symptoms are often functional and 4) SRC results in a wide variety of signs and symptoms that may or may not include a loss of consciousness.[22] This became the most commonly used definition of concussion, until the National Athletic Training Association (NATA) presented a new definition in 2014. The NATA defined a SRC as "a trauma induced alteration in mental

status that may or may not involve the loss of consciousness." [2] This definition offers a broader application to the term rather than limiting what a concussion really is. Increased research and awareness have led to an increase of recognition, which has in turn, increased the number of diagnosed concussions.

In the United States, the average incidence rate of concussion is 503 per every 100,000. [23] Incidence rates peak between ages nine to twenty-two due to an increased involvement in group athletic participation. [24] Athletes participating in sports involving contact or collision are at a greater likelihood for sustaining a concussion injury.[2] Collectively, as a result of sport participation, approximately 1.6-3.8 million sport related concussions are diagnosed annually.[25] With so many sport related concussions being diagnosed each year, sport related injuries have been named the second leading cause of traumatic brain injury in ages 15-24.[26] Despite concussions commonly being associated with sport related activity, they are not the most common cause of traumatic brain injuries.

It is important to remember that sport injuries are not the only method of sustaining a concussion. The leading causes of concussion are falls, motor vehicle accidents, struck by or against objects and assaults.[25] Of the traumatic brain injuries warranting an emergency room visit during the years of 1995-2001, 28% were from falls, 20% from motor vehicle crashes, 19% were by being struck by or against an object, and 11% from assaults.[25] Therefore, students in the general population are also at risk for sustaining concussive injuries. Despite a large focus on sport-related concussions, it is important to understand that concussions have a myriad of mechanisms and can affect anyone within the general population.

Concussive injuries in the college setting are generally associated with collegiate sports, however they are not the only population at risk. Among all National Collegiate Athletic

Association (NCAA) member institutions, there are approximately 450,000 athletes who are involved in sport participation, all of which are at risk for sustaining a concussion injury.[27] However, group sport participation is not limited to collegiate level sports teams due to the amount of intramural and club sports available to all students. Participation rates of students in club or intramural leagues in college is unknown, though it can be assumed that a large portion of those who participated in high school athletics do not make it to the collegiate level and thus participate at the club or intramural level.[28] With extreme numbers of concussions being reported annually, from both sports related and other incidents, it is important that there is understanding regarding the clinical presentation of concussions.

The clinical presentation of concussion varies within each individual and can manifest as physical, psychological, emotional, or cognitive deficits. Upon sustaining a hit to the head, damage to the brain occurs causing neurochemical changes that then triggers symptoms to occur.[29] These symptoms may or may not appear immediately after the suspected injury, as sometimes it can take hours or days before they appear.[13] If one or more of the following signs or symptoms is present, then a concussion injury should be suspected.[22] Physical signs and symptoms include but are not limited to: headache, dizziness, amnesia, loss of balance, double vision, nausea and sleep disturbances.[22] A headache is the most common self-reported symptom, followed by dizziness.[22] Psychologically, signs of anxiety and depression may be present as a direct or indirect symptom of concussion.[7] Emotional symptoms may result in changes in behavior such as personality changes, irritability, and unusual or inappropriate emotions.[21,22] Lastly, concussions may result in cognitive deficits such as slowed reaction or processing time, difficulty concentrating or remembering, and decreased attention.[7] While symptoms will present

differently in each individual, concussion symptoms as a whole can negatively impact a person's ability to perform daily task, especially those required for students in school.

The evaluation of a concussion injury is a critical aspect of the concussion management process. Initially upon sustaining an injury, the athlete should be immediately removed from participation for further evaluation.[2] A physical examination should be completed as it is essential to rule out a more significant head injury.[30] The physical exam is the number one assessment tool utilized in concussion evaluation for more than 85% of physicians.[31] This evaluation should include a self-report symptom assessment, motor control, mental status, and neurocognitive testing.[2] Each portion of the examination should be completed thoroughly to ensure that a multi-dimensional approach is utilized.

Symptom assessments should be completed using a symptom scale or checklist with the intent to assess symptom duration and severity. Assessments allow clinicians to screen concussive injuries as well as monitor the resolution of symptoms, and aid in return to play decisions.[32] It is likely that patients may be experiencing symptoms associated with a concussion for reasons other than a concussion.[2] Thus, it is important to compare back to baseline testing and utilize the rest of the evaluation before a diagnosis can be made. In combination to the symptom assessment, motor control should also be evaluated.

Motor control testing is assessed using balance testing, most commonly the Balance Error Scoring System (BESS).[33] This assessment is a series of three different stances completed on a firm surface, followed by the same three stances on an uneven surface. Each stance is held for a total of 20 seconds in which the administrator will count the patient's errors to determine a total score. The total score is then compared back to baseline results to determine if a balance

impairment is present.[30] Along with symptom assessment and motor control testing, a person's mental status must also be evaluated when a concussion is suspected.

Additionally, a mental status check is typically used on the sideline, immediately after sustaining the injury.[2] This provides an objective measure to help offer insight on whether a concussion has been sustained. The SAC and the SCAT-5 are common assessment tools used in this process to evaluate domains such as orientation, memory, concentration and delayed recall. The last part is the optional computerized neuropsychological test (CNP) which provide clinicians with the greatest amount of objective clinical data during the evaluation process.[34] This assessment can be utilized to help identify cognitive impairments even after symptoms have subsided.[30] Commonly used programs include the Assessment Metrics Cogstate Axon (ANAM), Concussion Vital Signs, and the Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT). While each testing program is different, they all assess the same domains which are as information processing, planning memory and switching mental set.[22] Protocols for using the neurocognitive assessments may vary among settings, however, they are often times multiple times to track neurocognitive deficits and recovery.[34] The testing takes place over the course of concussion recovery which can occur over a varying time frame dependent on the individual.

While most patients recover from concussion in 7-10 days,[35] several risk factors may lead to prolonged recovery. Approximately 80-90% of concussed patients will experience symptom resolution within the first 7-10 days after injury.[35] It has been suggested that experiencing symptoms 10 days after injury is considered to be a prolonged recovery time.[36] Further, it has been reported that the number, severity, and duration of symptoms a person experiences immediately after a concussion can indicate recovery time.[37] Those experiencing higher numbers of symptoms or higher rates of severity have been shown to take longer until symptom

resolution. Additionally, multiple concussive injuries can lead to lingering cognitive effects making it another indication of prolonged recovery.[3] People who have sustained a concussion, have a 2-5.8 greater likelihood of sustaining a second concussion injury.[30] Unfortunately, those experiencing symptoms for an extended period of time are at risk for the development post-concussion syndrome (PCS), defined as a signs and symptoms of a concussion that persist for weeks to months after the incident.[2,30] Diagnosis of this condition can be difficult due to vague non-specific symptoms, but it is important to consider in concussion management due to the affects it can have on participation in sports, activities of daily living and academic responsibilities.[2] Students that are experiencing prolonged symptoms or PCS are at risk for a more challenging RTL process. As a result of the sheer number of concussions occurring annually and the potential for prolonged recovery, many agencies, state and federal government agencies have enacted laws to help improve safety.

Despite recommendations provided for the management of concussive injuries, there was no mandated legislation until 2009 when the Lystedt law was passed in the state of Washington.[38] This law would require concussion education for athletes, parents and guardians, removing the athlete from participation if a concussion or head injury is suspected, and allowing athletes to return to participation only with written consent from a licensed health care provider trained in management of concussion.[38] As of 2014, all 50 states passed concussion related legislation for youth under the age of 18, in which a majority of them were modeled after the Lystedt law.[27] The laws vary per state, but many of them are only applicable for school affiliated sport activities rather than public facilities or organizations.[27] This leaves a large population who are experiencing concussive injuries that are not being protected under the law to receive appropriate concussion management.

In 2010, as a way to protect student athletes older than 18 who are participating at the collegiate level, the National College Athletic Association (NCAA) passed legislation requiring any NCAA institution, at all three levels, to develop and maintain policies for the identification and management of student athletes with concussions.[5] Polices must include the following: 1) concussion education to athletes and coaches, 2) athletes must be removed from play and evaluated by a trained medical professional if a concussion is identified or suspected, 3) guarantee that athletes with a concussion will not return to participation the same day of the injury, and 4) clearance for return to play can only be provided by a medical doctor or his/her designee.[5] These polices are extremely important in concussion management for student athletes, however it does not apply to the athletes who are participating in club or intramural sports. There is minimal structure regarding sport related concussions within collegiate club sports which may be attributed to teams being student-led.[28] Initially, clinicians and researchers centered concussion management on how to properly return an athlete back to physical activity. Therefore, the focus on much of the legislation surrounds return to play with each agency body requiring appropriate management including return to play guidelines.

It is essential that a gradual return to play protocol is followed to ensure the safety of the athlete. Return to play protocols should only begin after complete resolution of concussion symptoms and a normal clinical exam on all testing is achieved.[2] The return to play protocol is a gradual stepwise rehabilitation technique used to safely return athletes to participation.[21] RTP progression follows a 5 step progression which presents as follows: 1) symptom limited activity – consist of daily activities that do not exacerbate symptoms, 2) light aerobic activity – walking or stationary bike at a slow to medium pace, 3) sport specific exercise – running or skating drills that involve movement, 4) non-contact training drills – harder training drills such as a passing

drill, and 5) full contact practice – full participation in normal training activities.[21] Each phase is to be separated by a 24-hour period of rest in between. Progression to the next phase should only occur if the concussed individual did not experience symptoms during the previous phase.[2] If symptoms are experienced during a phase, the athlete should stop the activity immediately and repeat the stage again after the 24 hour rest period.[2] All components of concussion management are essential to a smooth recovery; however, attention has focused on the return to play aspect while the (RTL) progression has been limited. Significantly less attention has been given to the development of formal policies or guidelines that are necessary to effectively support the student athletes recovery in the classroom.[7] Although return to play legislation has played a major role in the protection of athletes participating in sports, the development of RTL polices are just as imperative.

Based upon the amount of concussions occurring in sport participation, management has been centered around return to play, however it is becoming evident that RTL should be considered in the management process. This has led to the development of state legislation polices regarding concussion management within the classroom. By 2016, eight states had established RTL laws, all of which had varying aspects mainly focusing on student athletes rather than general population.[6] The development of such laws is beneficial; however, they are only applicable to students in k-12. Currently, no laws have taken effect to guide RTL post-concussion within the collegiate setting. However, the NCAA has provided suggestions for information that should be incorporated in a school's concussion protocol.[39] These suggestions recommend utilizing a multidisciplinary team throughout the student's recovery and not allowing the student athlete to return to the classroom on the same day the injury occurs. After the initial day of rest the athlete can continue rest if they cannot tolerate cognitive activities or they return

to the classroom and studying on an individual basis.[39] While RTL is gaining significance in the concussion recovery process, further legislation should be considered to increase the number of states developing RTL laws.

Implementation of laws and regulations make up the foundation for return to RTL management, but the polices must provide more focus on key parts such as academic accommodations. A study conducted by Kerr et al., 2015, found that RTL policies were only implemented in 63% of the participating universities, with only 3.1% addressing academic support. Another study analyzing RTL in high school and collegiate athletic trainers, revealed that 73.9% of their respondents had established RTL polices at their respective school.[4] However, only 38.1% of those respondents actively implemented the protocols within their clinical practice.[4] Developing uniform polices implementing a gradual RTL is essential for providing effective academic support to students recovering from a concussion. This will provide insurance that all students across activity groups receive appropriate care for both returning to sport and the classroom. Through the development of state and federal legislation for concussion management, guidelines have also been developed to provide an outline for what the management process should resemble.

Return to Learn

Although focus on return to play is important, it is crucial that concussion management also incorporates guidelines concerning RTL. The multitude of symptoms that can occur during a concussion can interfere with ones learning process.[29] Based upon RTP protocols, RTL progression should obtain a gradual approach in which academic function is progressed slowly over time as symptoms decrease. Full integration into the classroom can be detrimental to a student recovering from a concussion because it can exacerbate symptoms. Brown et al., 2014,

found that concussed patients engaging in higher levels of cognitive function endured the longest period until symptom resolution, compared to those partaking in moderate levels of activity who had the best resolution outcomes. Thus, the overarching goal of concussion recovery is to avoid overexerting the brain to prevent worsening or reproduction of concussion symptoms.[19] In order to provide optimal support to students in the classroom, a gradual RTL policy utilizing academic accommodations is necessary.

Throughout the duration of concussion recovery, college students will be experiencing symptoms that will inhibit their daily lives, especially academic performance, a student's main responsibility.[2] Specific symptoms have been associated with classroom difficulty including: difficulty remembering, confusion, irritability, blurred vision, sleep problems, and sensitivity to noise.[13] Cognitive impairments, such as slowed reaction time and processing speed, have been proven to negatively impact students' academic performance.[4] Often people do not associate emotional symptoms, fatigue and difficulty concentration as symptoms of concussion causing an increased risk for premature return to school.[12] This misunderstanding is likely due to inadequate knowledge of concussions and what the symptoms may encompass.[40] Premature return to the classroom, along with many other reasons, increases the likelihood that one will experience a prolonged recovery.

Return to learn polices should implement a progressive stepwise process. The initial step in acute concussion management for the recovering student is cognitive rest. Cognitive rest has been defined as limiting exertion with activities of daily living and academic scholastics while experiencing symptoms.[9] This includes avoiding activities that may worsen symptoms such as school, homework, reading, videogames, computer, and tv.[10] The idea of cognitive rest is based upon the ideology that increasing the energy demands of the brain to perform cognitive activity

may in turn exacerbate symptoms.[41] This is best achieved through maintaining ones sub-symptom threshold, outlined by keeping cognitive activities below the level of triggering symptoms to increase or reoccur.[10] Avoiding the sub-symptom threshold can be particularly problematic upon initially returning to the classroom while a student is still experiencing physical, cognitive, and/or emotional challenges. This concern can be controlled through utilizing a gradual RTL protocol incorporating a slow increase in cognitive activity as the brain recovers from injury.

This gradual approach consists of an initial period of cognitive rest, followed by light cognitive rest, return to school part time with accommodations, increased school attendance with decreased accommodations, and a full return to school with no accommodations.[11] Suggestions have been made to begin with small time increments of cognitive activity followed by a break. Should symptoms occur or worsen, the same time increment should be repeated, however if symptoms are not exacerbated, the time increment should be increased for the next round of activity.[10] A study analyzing concussions in a sports medicine clinic found that approximately 44.7% of their patients were returned to the classroom too early.[11] Therefore, it is essential that appropriate guidelines are being implemented to best support the student and promote their academic success.

Despite a lack of federal and state mandates regarding RTL polices, efforts have been made to develop such guidelines. Similar to a return to play protocol, RTL polices have also adapted a gradual five to six step process. Policies such as the Parachute program, return to learn protocol, the return to school protocol (RTS), and the US Air Force Academy RTL program have all utilized this method.[12–14] Each policy incorporates the suggested step wise progression beginning with initial rest, then minimal cognitive activities, return to school with maximal

academic accommodations, reduction of academic accommodations, and finally a full return to school with no adjustments. The Parachute program, based out of Canada, is a RTL protocol that includes a 6-step plan for returning to the classroom (Fig 2). It follows the same general outline as many other protocols with slight differences that break down the modifications offering more recovery time.[42] Research has found this protocol to be effective in classroom management for the elementary through high school aged population.[13] Similarly, the United States Air Force Academy developed a RTL protocol in order to provide its cadets support during academic recovery after a concussion.[14] Due to the nature of the academy, cadets are exposed to a higher level of physical activity as well as very demanding schedules allowing minimal time for recovery.[14] Therefore, a RTL protocol was developed utilizing similar RTL steps that were adapted to be specific to the academy needs. Cadets at the academy are at a higher risk for suffering concussions due to the requirements for physical education classes, participation in NCAA, club or intramural sports, and participation in military training events.[14] In addition, cadets must also keep up with very demanding schedules in which attendance in mandatory, therefore there time to rest after a concussion injury is limited.[14] It is important to allow for a RTL protocol that not only protects the athlete from further harm but allows them enough time to recover from injury.

Another policy that has been developed is the return to school protocol incorporating 5 stages (Fig 3). However, unlike many other protocols it is based upon 4 constructs used to guide academic accommodations once a student re-enters the classroom. Those constructs include timetable and attendance, curriculum, environmental modifications, and activity modifications.[12] The first construct, timetable and attendance, promotes a gradual reintegration to learning slowly progressing the amount of time a student spends in the classroom based upon their symptom

severity.[12] Curriculum ideally would be based upon the cognitive stress required for each classroom and the cognitive abilities of the individual student. This also advocates that no homework should be given initially and then gradually progressed in fifteen-minute increments.[12] The third construct that should be considered are environmental accommodations which includes preferential seating, avoiding busy, loud areas, sunglasses for light sensitivity or earphones to minimize noise.[12] This allows for the student to participate in classroom activities but also minimize the increase of symptoms.[12] Lastly, general activity modifications such as limiting screen time on computers, tv, and phones should be considered. Minimizing screen time to 15-minute blocks initially and progressing up to an hour. This newly developed protocol was well received by families, educators, and health care professionals making it a useful tool in concussion recovery.[12] Official polices are ideal, however they are not the only tool that can be utilized to concussion management.

Other suggestions for RTL management, specifically for the collegiate setting is a method called the Universal Design for Learning (UDL).[13] Typically, the UDL design is utilized for students with disabilities in the K-12 setting, however it has been found to be beneficial for the postsecondary setting as well.[43] The overarching goal is to provide a more inclusive learning approach that meets the needs of all students.[44] Specifically, the idea is that a normal curriculum is challenging for certain students who have different learning preferences or needs.[44] Students with a concussion may have altered learning needs during their recovery that are temporary or long term in nature. UDL is a program that can be characterized by flexible, functional, consultative, individualized and/or customized using multiple methods and strategies for engaging course content.[13] The UDL design focuses on three hallmark techniques that provides multiple means of representation (lectures, videos), expression (exams, papers, oral

presentations), and engagement (hands on activities, group projects) to provide a student centered learning environment.[43] This concept follows the idea of providing individual accommodations based on the needs of a student which is ideal for those recovering from a concussion.[13] Many guidelines, similar to the United States Air Force Academy, exist utilizing the same principles but are adapted to be unique to specific schools and populations. However, protocols such as the return to school, return to learn, and parachute programs are broad, more generally applicable protocols. In addition to these protocols, programs have been created following the gradual RTL strategies.

Concussion programs such as REAP (remove/reduce, educate, adjust/accommodate, pace) were developed to help provide awareness, educational tools, and management guidelines. REAP is a community-based model for concussion management providing a guide on the care of a concussed pediatric athlete.[45] The program was developed to fill the gaps of the legislations by expanding concussion education to medical providers and families.[45] REAP provides more information regarding appropriate management and when it is safe for an athlete to return to participation. The guidelines include removing athletes from all activity, reducing cognitive stimulation at home and at school, education for parents, students and educators, adjusting school and home activity.[45] Additionally, the program focuses on a multidisciplinary team approach utilizing four teams: family team, school team – physical, school team – academic, and medical team. Each team is provided specific education in regard to the information necessary to them and guidance on their role in supporting a student throughout their concussion recovery (Fig 1).[46] Regardless of the type of RTL policies, the common recommendation, similar to the return to play, is a gradual return utilizing academic accommodations to optimize recovery time.

Accommodations

Academic accommodations are an essential part of what makes the RTL process a gradual stepwise approach. Academic accommodations are defined as, "a variety of techniques and or supports that are used to provide a student with disabilities full access to the general curriculum." [47] The goal of accommodations is to minimize or eliminate a disability-related barrier that does not create an advantage to the student with disabilities, yet creates the same access to learning, knowledge and skill.[47] Appropriate accommodations are those that include changes in instructional activities, testing procedures, or materials within the previously listed boundaries.[47] Federal laws have been developed requiring facilities to provide academic accommodations to ensure individuals with disabilities are receiving the same access to education.

One law that serves as a statue for all aspects of life is The American with Disabilities Act of 1990 which was implemented to mandate services within the public. The civil rights law was passed to prohibit the discrimination of individuals with disabilities in all areas of life, including employment, transportation, housing and social services.[48] Similar to section 504, a handicapped person is defined as a person with physical or mental impairments substantially limiting one or more of the individuals major life activities, or if the person has a record of such an impairment.[48] Due to this law being specific towards the, it best covers concussive injuries at work place rather than the educational setting. individuals suffering from concussive injuries within the educational setting are covered under the two laws specific to education.

The first law that was passed into legislation protecting individuals with disabilities among all educational systems to receive accommodations was The Rehabilitation Act of 1973. The Rehabilitation Act of 1973 is a broad civil rights act stating that qualified handicapped

people cannot be excluded from any program that is federally funded due to their disability.[49] Regulations of the act defined a handicapped person as, "anyone having a mental or psychological disorder such as a specific learning disability." [49] The aim of this law was to provide broad regulations in the educational settings to ensure that those with disabilities would not be discriminated against and could receive accommodations. This law does not provide any funding to provide extra services to students but does require the accommodations. Further this act houses what is known as Section 504.

Section 504 of the Rehabilitation Act of 1973 is a continuation of the civil rights law focusing on the promotion of access and equal opportunity for handicapped persons.[16] This law covers all post-secondary educational settings to provide reasonable and appropriate accommodations to all disabled students in order to provide them equal access to the general curriculum. Under this law students are able to receive accommodations as long as they meet the two requirements which are having a medical condition that is diagnosable and that significantly impairs a major life function. Regulations specify that major life functions include caring for one's self, performing manual task, walking, seeing, hearing, breath, learning, and working.[50] There is no time frame for the duration of the disability, therefore students with a concussion are able to receive temporary accommodations while experiencing symptoms if they provide medical documentation of the condition. However, if long term accommodations are needed due to post-concussion syndrome, students still qualify under this law. Section 504 governs all post-secondary settings, but also applies to the K-12 setting.

Within the secondary education setting, the Rehabilitation Act of 1973 and Section 504 provide the same broad regulations for students. The main difference at this level compared to the collegiate setting is that students at the K-12 level are able to obtain Section 504 academic

accommodation plans. This allows students to receive temporary accommodations, not services, for conditions such as concussive injuries. Accommodations provided through a 504 plan in secondary education often times will not carry over into post-secondary education due to the different regulations, however steps can be taken to receive accommodations in the collegiate setting.[50] While Section 504 of the Rehabilitation Act plays a major role in the protection of students with disabilities in all educational settings, it is not the only mandate governing secondary education.

The Individual with Disabilities Education Act of 1995 was passed to provide specific educational services to students in K-12. This is a federal law requiring all federally funded states to provide services to students with disabilities.[51] Additionally, it has several key components which are used to help mandate schools. All must provide free appropriate public education (FAPE) as well as individualized education programs (IEP) to those needing them[51]. The IDEA focuses on implementing services to students with the goal of students being successful and receiving their diploma which is different than section 504 with the main goal of equal access. IDEA covers students with more long-term disabilities, that would be appropriate for a student with post-concussion syndrome. However, short term accommodations in the K-12 setting would fall under the Section 504 academic accommodation plans. The majority of people recovering from a concussion will experience symptom resolution relatively quickly, thus needing more temporary accommodations compared to a formalized plan.

Students requiring academic accommodations following concussion are often able to manage their recovery using temporary accommodations that are easily adjustable as symptoms subside. These accommodations that are temporary in nature are considered to be informal accommodations.[52] An accommodation can be defined as “changes in assessment materials or

procedures that address aspects of students disabilities that may interfere with the demonstration of their knowledge and skills." [53] Common forms of academic accommodations are excused absence from classes, rest periods, assignment extensions, postponement of test, extended test time, accommodations for sensitivity to light or noise, excusal from gym activities, note taker, and/or alternate formats of assignments.[3] Every concussion will present differently requiring accommodations and management plans to be developed on an individual basis. An effective management plan should apply the general recommended accommodations based upon the needs of the student. The individualized management plan should align with the concussion related symptom and deficit. Students who are having difficulty concentrating or remembering may benefit from having test dates postponed until the symptoms are resolved.[7] Those experiencing slowed processing speed may benefit from additional time to review course materials or complete assignments.[7] However, many factors play a role in the necessary accommodations, such as the course design.

Due to the nature of college classes, many classes are offered online rather than face to face. This changes the dynamic in which a student interacts in the classroom setting and how assignments and instruction is completed. For students suffering concussion symptoms, an online class or assignment requiring the use of a computer may present with its own unique set of challenges that must be considered. Students experiencing vision disturbances such as sensitivity to light or blurry vision may need alternative forms of course material in the form of audio formats.[13] The goal of accommodations for students with visual impairments is to minimize the amount of visual processing required, therefore other helpful adjustments to be considered is a slower pace of screen movement, altered font style and size, or adjusted color contrast and backgrounds.[13] Students involved in classes requiring large amounts of screen time on the

computer are recommended to complete assignments in small, manageable blocks of material or time in order to help minimize effects on concussion symptoms. Utilizing academic accommodations for concussion is relatively new and not widely practiced, however they are a valuable piece of the puzzle in concussion management.

Academic Accommodations and Concussion

Typically, academic accommodations are provided to students with learning disabilities, however they are equally valuable to students with a concussion. Academic accommodations are provided to offer support to the recovering student in maintaining academic demands in a way that does not stress cognitive functioning worsening symptoms.[3] A survey analyzing parents of concussed youth, found that 70% believed their child needed some form of academic support upon returning to school after a concussion injury.[7] This identifies the need and importance of academic accommodations within the classroom after a concussion injury. Modifying the academic setting for a short duration while a student recovers can promote a smooth transition back to full integration in the classroom and provide little interruption to their daily life.[54] The implementation of academic accommodations for students recovering from a concussion is vital to the recovery process, therefore it is important to understand who is responsible for providing the recommendations.

The role of implementing academic accommodations is typically left to various professional roles. This guide can come from a variety of people whether that is their athletic trainer, physician or someone from their school administration. Athletic trainers are commonly identified as the primary care provider for student athletes with a sport related concussion.[4] In a study analyzing RTL practices in secondary school and collegiate athletic trainers, 76.8% felt part of their role included managing the RTL process.[4] For those who do not have athletic

trainers, health care professionals such as primary care physicians and emergency department physicians are the next available resource.[55] Often times, physicians can provide a letter of academic accommodations giving concussed patients access to recovery strategies by outlining recommendations for accommodations.[15] While this may be beneficial for some students, the letter is not a legally binding document indicating that facilitation and implementation of accommodations becomes the responsibility of the athletic trainer, administrators, and educators.[4] Athletic trainers, physicians, and administrators are excellent resources, however, educators such as professors and academic advisors are the root of what occurs in the classroom. This is what makes their involvement so crucial in the RTL process and allows them the best position working to develop a plan that reduces the student's workload.

School personnel, such as academic advisors and professors, play a major role in helping provide this assistance to those recovering from concussions who are in need of academic support. The NCAA recommends a multidisciplinary team approach that involves the academic counselor and course instructors.[39] Their role in the concussion process is to support managing academic success, overseeing day to day activities at school and monitoring cognitive and emotional symptoms.[46] Academic advisors work at the collegiate level and perform the following duties: 1) assist students with academic plans consistent with their interests and abilities, 2) interpret academic policies such as repeats for change of grade, academic reassessment, and degree requirements, 3) serve as referrals to other institutional services such as placement and registration.[56] Through their many duties, students challenged with academic difficulty can meet with their designated advisor to create educational strategies that will enhance their academic success.[56] Students with concussions are likely to experience academic difficulty due to the onset of concussion symptoms. Therefore, an academic advisor is a useful

resource for students to seek assistance in order to develop a plan utilizing academic accommodation to promote academic success.

Another beneficial resource that is easily assessable to students is their teacher/professor. The level of which an employee can teach within a university is based upon their academic ranking. Most generally known is the title of professor which is then split into assistant professor, associate professor and professor.[53] Professors at any level have likely obtained a doctoral degree or something equivalent, however the levels differ based on upon experience and merit within their respective field of study.[57] Those at the professor level are often on a tenure track with the goal of obtaining permanent employment at their University.[58] Additionally, faculty can take the role of instructor or clinical instructor. An instructor is a probationary term in which a person is typically working towards the expectation of progressing into the rank of a professor.[58] A clinical instructor is someone who spends majority of their time engaging in practical instruction and application of practical knowledge.[57] It is likely for colleges and universities to have employees that are adjunct faculty, meaning that they are an expert in their field of study but is not a full time employee at the university.[57] Often times adjunct faculty are part time or on a discontinuous basis. Despite the different rankings one can obtain to teach at the university level, all maintain the role of supporting students in the classroom.[13] Each individual, regardless of their job description, plays a major part in helping to manage a student with concussion during the recovery process. They have a direct relationship to student's classroom responsibilities and academic success allowing them to be a great resource for students.[19] While academic advisors and professors have a significant role in the RTL process for a student recovering from a concussion, minimal research has examined what they know in regard to concussion management in the classroom. Understanding the role of academic advisors and

professors to implement academic accommodations following concussion is relatively new; however, literature has examined these roles in disabled students. In a study by Preece et al., 63% of academic advisors played a direct role in arranging academic accommodations for students with disabilities. One third of those accommodations being extended test time, alternate testing locations, or note takers, all of which are similar to accommodations that would be provided to assist students recovering from a concussion. Despite many of the participants in the study stating they have had experience providing accommodations, 74.2% of advisors felt the biggest barrier for assisting those with disabilities was a lack of knowledge.[59] With participants feeling knowledge is the biggest barrier, their understanding becomes even more important. Especially because this same pattern could likely be seen for accommodations in regard to concussion.

Academic advisors and professors are often involved in the management of a student's return to the classroom; however, it is unclear what this population knows about concussions, RTL protocols, and academic accommodations. Professors and academic advisors have a direct connection with the students' education, therefore it is important for them to understand the effects of a concussion and how they can assist in concussion recovery by reducing cognitive demands.[19] A study by Dreer et al., found that only 4.6% of educators from varying levels felt extremely confident and 17% felt very confident in concussion knowledge. The same study revealed that only 12.4% of educators felt very knowledgeable in concussion symptoms.[8] Another study examining academic concussion management in secondary school teachers, before and after a presentation, reported that only 4.5% had prior training in academic management for concussed student.[60] These findings provide evidence that those outside of medical background involved in the concussion management process, such as educators, may

lack the basic knowledge needed assist in implementing appropriate effective management techniques.[60] Therefore, educating academic advisors and professors about concussion and their effects as well as their role in concussion management is essential.[7] This education would help guide a gradual return to academics utilizing appropriate accommodations to ensure the students recovery is being supported.[61] It is common for students with learning disabilities to seek academic accommodations through professors, however they may not always be willing. While academic advisors and professors' knowledge of this information is important, their willingness to provide such accommodations is key in a student's recovery.

The current state of literature does not provide a great understanding regarding the academic advisors and professors' willingness to provide accommodations for students. Researchers suggest several factors that influence a professor's willingness to provide academic accommodations to those with learning disabilities. Influences include age, discipline, teaching experience, highest degree earned and rank.[20] In this study, senior faculty were more willing than junior faculty and those in an educational discipline were more willing than professors in other disciplines to provide academic accommodations.[20] Despite the influential factors, professors who had a greater understanding of the academic accommodations and their necessity for student education, was positively related to professor willingness. While willingness to provide accommodations is not researched regarding concussions, it is possible that the same patterns would be present. Incorporating education of concussion management and the RTL process to professors and academic advisors may allow for a better understanding the importance of academic accommodations leading to greater willingness to provide assistance.

Concussion occurrence rates have drastically increased leading to the examination of concussion management. Existing research regarding concussion management has primarily

focused on return to play, with little reference to RTL. Emphasis on RTL is slowly gaining significance with knowledge about the importance of cognitive rest and a gradual return to the classroom. The increase has led to the development of RTL policies in all levels of the school setting providing information on how to appropriately return a student to the classroom.[4] While it is beneficial having RTL guidelines, they do not necessarily advocate academic support for the recovering student. Academic advisors and professors play a major role in advocating for concussed students by their direct assistance in concussion management in regard to implementing academic accommodations. Despite this role, the benefits of accommodations are only useful if they are being utilized. Improper implementation could result from academic advisor and professors' lack of understanding RTL polices, academic accommodations, and their role in the process. However, the current level of knowledge and willingness academic advisors and professors have to provide accommodations for concussive injuries remains unknown. Gaining an understanding of the familiarity that academic advisors and college professors have regarding concussion management in the classroom could allow for adjustments in educational plans needed to provide a smooth transition to the classroom for recovering students. Therefore, the purpose of this study is to determine the knowledge academic advisors and college professors have of concussion, the RTL process and their willingness to provide academic accommodations to students recovering from a concussion injury.

Figure 1. Example of the multidisciplinary approach utilized in the REAP program and what each person's role is over the course of the students concussion injury. [46]

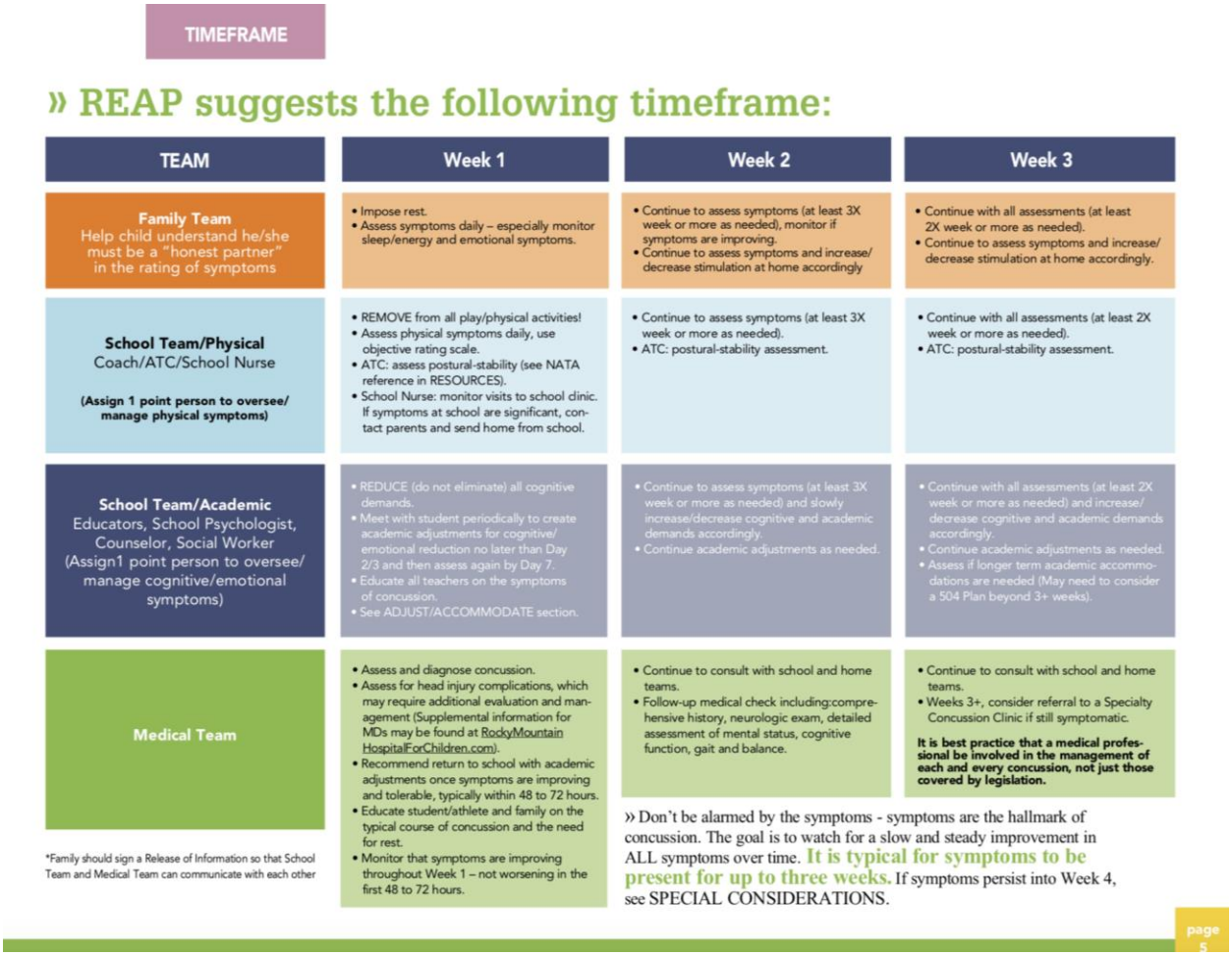

Figure 2. Six step Parachute Program for returning to the classroom after a concussion.[42]

Step One	Cognitive and physical rest
Step Two A	Light cognitive activity
Step Two B	Light physical activity
Step Three	Part time school – light load
Step four	Part time school – moderate load
Step five	Nearly a normal workload
Step Six	Full return to school at normal workload

Figure 3. Five stage Return to School Protocol.[12]

Step One	Brain Rest – No school
Step Two	Getting Ready to Go Back
Step Three	Back to School/Modified Academics
Step Four	Nearly Normal Routines
Step Five	Fully Back to School

CHAPTER THREE

MANUSCRIPT

With an increase in sport participation among athletes of all ages, concussion occurrence rates have also increased to as high as 3.8 million per year,[25] influencing concussion awareness at all levels.[1] In 2014, the National Athletic Trainers Association provided a position statement defining concussion as "a traumatic induced alteration in mental status that may or may not involve a loss of consciousness."[2] Symptoms of concussion can include, but are not limited to, somatic, cognitive, and/or emotional symptoms, all of which can affect the athlete's activities of daily living, academic scholastics, and participation status.[3] These concussion symptoms can warrant restriction in regard to sport participation. Therefore, current standard of care following a concussion includes return to play (RTP) protocols that consist of a 5-stage progression that gradually progresses to a full return to participation.[21] The RTP protocol focuses on physical activity, but some limitations and challenges present in the classroom setting as well creating a shift to include and establish protocols for return to learn (RTL).

As of 2009, all 50 states incorporated return to play guidelines within state laws. However, in 2016 only 8 states had established RTL laws all of which had varying aspects mainly focusing on student athletes rather than the general population.[6] Kerr et al., found that RTL policies were implemented in 207 out of 327 (63%) of NCAA universities studied, with only 3.1% of those addressing academic support to help manage concussed athletes.[5] Despite this, the RTL process is a key component in providing students with an effective way to maintain academic responsibilities until symptom resolution occurs. Students are tasked with challenges that require high levels of cognitive function that can be significantly impaired due to the effects of a concussion.[62] Returning to high levels of functioning prematurely can cause an exacerbation

of symptoms and potentially prolonged recovery.[12] Therefore, it is vital for students to follow a RTL progression in which academics are slowly reincorporated into the students' workload.

The gradual progression may vary slightly based upon academic level; however, literature is fairly consistent among all RTL polices. Initially, students should begin with cognitive rest and gradually progress into academics as symptoms begin to resolve.[7] This piece is crucial as excessive cognitive function can exacerbate signs and symptoms.[35] Development of RTL policies has been crucial to the evolution of concussion management; however, their benefits may be limited if those responsible for providing care and support are unaware of concussion effects on learning and how to minimize cognitive demands utilizing academic accommodations.[19]

Academic accommodations are defined as, "a variety of techniques and or supports that are used to provide a student with disabilities full access to the general curriculum." [47] Implemented for concussion recovery, academic accommodations are provided to offer support to the recovering student in maintaining academic demands in a way that does not stress cognitive functioning and worsen symptoms.[3] Some common accommodations include excused absence from class, postponement of test, and assignment extensions. Following concussion, a majority of students will only need temporary accommodations, although some students may require formal documentation for long term academic accommodations. Both temporary and formal academic accommodations are supported in varying levels of academia, however, they may differ based on the setting. Regardless of setting, the goal for concussion recovery is to determine the appropriate level of cognitive activity that is not harmful to the student.[7] However, this process may look different in secondary versus post-secondary settings based on laws and governing regulations that require students with disabilities to receive appropriate care.

Legislation that addresses disability and accommodations include: The Rehabilitation Act of 1973, specifically Section 504, the Individuals with Disabilities Education Act (IDEA) of 1995 and its reauthorization in 2004, and the Americans with Disabilities Act (ADA) of 1990 and its amendment in 2008 (ADAAA). The Rehabilitation Act broadly covers civil rights for individuals with disabilities, including reasonable academic accommodations. IDEA is a more specific civil rights law offering special education services and accommodations to provide free appropriate public education (FAPE).[51] ADA a statue to protect individuals with disabilities in all public aspects of life such as employment, transportation, and housing.[48] The concept of prohibiting discrimination against students with disabilities remains the same between all educational levels, however, there are some differences. While The Rehabilitation Act and IDEA both govern education, the IDEA is exclusive to K-12 whereas Section 504 covers all public education institutions including postsecondary settings. Specifically, Section 504 provides accommodation plans for students with disabilities who require accommodations yet do not need special education services. Section 504 of The Rehabilitation Act is a broad civil rights law that focuses on equal access to the general curriculum provided through accommodations.[50] These laws allow for students with disabilities, even concussive injuries, to receive academic accommodations as needed allowing them to continue to access the general curriculum. The signs and symptoms of a concussion can cause significant challenges for students completing academic tasks, especially at the collegiate level, requiring use of accommodations.

Clinicians and educators in post-secondary settings should approach accommodations differently due to the fact that the rigor and schedule of college academia is different than that of the secondary educational setting in the sense that students spend less time in the classroom, have periodic breaks throughout the day, and require increased course work outside of the

classroom.[62] Less time spent in a structured class may allow for fewer accommodations necessary in the classroom and force implementation regarding outside course work such as postponing assignment deadlines. In the collegiate setting, accommodations are provided to allow for an equal opportunity between all students compared to secondary schools which follow the "no child left behind" principle by offering remedial services.[18] Utilizing academic accommodations during classroom management of concussions is ideal, however they must be effectively implemented in order for them to be beneficial.

Implementation of RTL policies have allowed for progression in concussion management; however, more focus should be directed towards the application of polices into the classroom with specific guidance on utilizing academic accommodations. In the post-secondary setting, school personnel such as academic advisors or professors are often those responsible for implementing reasonable academic accommodations and managing students' full integration back into the classroom. Advisors and professors role in concussion management is to support managing academic success, overseeing day to day activities at school and monitoring cognitive and emotional symptoms.[46] Academic advisors and professors have a direct relationship to students' classroom responsibilities and academic success allowing them to be a great resource to implement accommodations.[19] Despite this role, it is unclear what this population knows about concussions and RTL protocols. Previous research on concussion RTL has primarily been directed towards those in the K-12 setting, therefore less is known about concussion management in the post-secondary education.

A study by Dreer et al., analyzing post-secondary educators found that only 4.6% of educators from varying levels felt extremely confident and 17% felt very confident in concussion knowledge.[8] The authors posited that this could be due to the fact that this population does not

receive education or guidance on concussion management, the RTL process, or academic accommodation.[7] Therefore, those involved in the RTL process may not attain the appropriate knowledge to provide accommodations. Lack of knowledge may directly impact an educator's willingness to provide academic accommodations for those recovering from a concussion injury. Current literature does not provide a great understanding on academic advisors and their willingness to accommodate for concussive injuries. However, research does suggest factors that may influence their willingness include: age, discipline, teaching experience, highest degree earned and rank.[20] While willingness to provide accommodations is not researched regarding concussions, it is possible that the same patterns would be present. Further, little research has investigated professors and academic advisors' concussion knowledge and willingness to provide academic accommodations for concussed students.

Gaining an understanding of the familiarity that academic advisors' and college professors have regarding concussion management in the classroom could allow for adjustments in educational plans needed to provide a smoother transition to the classroom for recovering students. Therefore, the purpose of this study was to determine academic advisors and college professors' knowledge of concussions and their willingness to provide academic accommodations to students recovering from a concussion. It is hypothesized that 1) academic advisors and professors have a low level of concussion knowledge, 2) there will be a positive relationship between level of concussion knowledge and willingness to provide academic accommodations, and 3) participants from the health and education disciplines will be more willing to provide academic accommodations than those from other disciplines.

Methods

Population

A cross-sectional between-group study design examined differences between academic advisors and professors. A group of 1,073 participants were recruited for the study based on a convenience sample of academic advisors and professors from a Division 1 University in the Southeastern part of the United States. Two hundred seventy-five participants responded and were divided by job title (academic advisor and professor). Thirty-five academic advisors (37% response rate) and 205 professors (21% response rate) completed surveys. The professor job title consisted of participants from varying academic levels such as lecturer, instructor, assistant professor, associate professor, and professor. Disciplines included: arts and humanities, behavioral and social sciences, business, education, engineering and computing, health professions, public health, and science and mathematics. Inclusion criteria consisted of being a full-time employee at the University with a minimum of one year of employment at the University. Exclusion criteria was anyone holding a position as a graduate assistant, teaching assistant, temporary or adjunct professor.

Instrumentation

Previously published surveys examining concussion knowledge and willingness to provide academic accommodations (Hunt, 2015; Rao, 2003) were combined and utilized in this study. The survey was examined for content validity by experts in the field of concussion and student disability. The survey consisted of three sections for a total of 51 questions. Section one consisted of 25 demographic questions based upon influences in previous literature. This second section examined concussion knowledge. This section asked participants to identify concussion signs and symptoms followed by true/false scenario-based questions. Data was scored for the total number of questions answered correctly. The third section aimed to determine participant

willingness to provide academic accommodations. Accommodations were provided on a Likert type scale ranging from 1-5 with 1 being unwilling to provide the accommodations and 5 being willing to provide the accommodation. Each accommodation was scored and examined individually. In total the survey took approximately 10 minutes to complete.

Procedures

Approval from the University's Institutional Review Board (IRB) was obtained prior to any data collection. The online survey was sent via Qualtrics© to every faculty and academic advisor at one Division I University. A cover letter was included in the survey describing the purpose and importance of the information, inclusion and exclusion criteria, as well as a link to the online survey. Reminder emails were sent out twice at two-week intervals for participants who had not yet completed the survey. The survey link was available for a total of six weeks.

Statistical Analysis

All data were examined for outliers, and none were found. Descriptive statistics were calculated for demographic questions, knowledge and willingness scores. A one-way ANOVA was calculated to examine differences between academic advisors and professors' level of knowledge. Multiple Pearson correlations were calculated to determine the relationship between participants' concussion knowledge and their willingness to provide specific academic accommodations. A MANOVA was used to determine the potential interactions and main effects between academic discipline and academic rank with regards to concussion knowledge and willingness to provide academic accommodations. Follow-up one-way ANOVAs and Scheffé post hoc analyses were planned to determine potential group differences for main effects.

Results

Academic Advisors

The current study included a sample of 35 academic advisors (37% response rate). The sample was primarily female (85.7%) and Caucasian (80.0%). The majority of academic advisors had 1-4 years of total experience (n=28, 80%) with only 1-2 years of experience at the respective university (n=13, 37.1%). Almost all academic advisors were willing to provide accommodations for students with concussion (n=33, 94.3%). However, the majority of the sample reported not receiving any form of concussion education (n=31, 88.6%). Descriptive statistics for the entire sample are reported in Table 1.

Professors

Two-hundred and five professors (21% response rate) completed the survey. The majority of the sample was Caucasian (85%) with a gender make up of 61.5% female and 38.5% male. Participants were recruited from all disciplines with the highest representations from Arts and Humanities (n=47, 22.9%), health professions (n=40, 19.5%), Science and Mathematics (n=31, 15.1%) and Behavioral and Social Sciences (n=30, 14.6%). The average professor had approximately 20+ years of total experience (n=64, 31.2%) with 9-10 years of experience at the respective university (n=41, 20.0%). Professors reported their willingness to provide academic accommodations for concussed student (n=202, 98.5%) with a large portion not receiving any form of concussion education (n=186, 90.7). See Table 1 for additional descriptive statistics.

Frequencies were calculated for each academic accommodation to determine advisors and professor's willingness to accommodate. Majority of faculty answered 3, 4, or 5 on the Likert based scale for all accommodations. Allowing a student note taker received the most willingness with 90% of the sample responding with 5's on the Likert scale. This was followed

by allowing sunglasses in the classroom at 90.4%, alternative testing location at 89.2%, and allowing extra test time at 88.3%. See table 2 for additional frequencies.

A one-way ANOVA was calculated to examine group differences on concussion knowledge. Mean values for concussion knowledge in regard to academic advisors was 22.28 ± 1.94 (76.8% correct) and professors was 21.99 ± 2.34 (75.8% correct). No statistically significant differences existed in concussion knowledge between academic advisors and professors ($F_{(1,238)} = 0.624$, $p = 0.430$).

Multiple Pearson correlations were examined between participants' concussion knowledge and their willingness to provide academic accommodations. Several correlations revealed statistically significant results: allowing extra time on exams (r = .160, $p = .013$), postponing exam dates (r = .161, $p = .012$), providing alternative forms of assignments (r = .161, $p = .012$), and allowing sunglasses in the classroom (r = .135, $p = .036$). No other statistically significant correlations existed between participant's knowledge and willingness to provide the following accommodations: tape recorded lectures (r = .032, $p = .624$), printed copies of lectures (r = .035, $p = .588$), extended deadlines for assignments (r = .125, $p = .052$), alternative form of exams (r = .076, $p = .238$), excuse absence (r = .063, $p = .331$), alternative testing location (r = .102, $p = .115$), use of a note taker (r = .049, $p = .447$). A full correlation table can be found in Table 3.

A MANOVA was calculated to examine job title and discipline effects on concussion knowledge and willingness to provide academic accommodations. No significant interactions were found, $F_{(6,234)} = 1.51$, $p = .173$, $\eta_p^2 = .020$. Additionally, no main effect was found for job title, $F_{(2,238)} = 2.06$, $p = .130$, $\eta_p^2 = .018$. There was a significant main effect for academic discipline and willingness to accommodate, $F_{(16,224)} = 2.38$, $p = .002$, $\eta_p^2 = .078$. However,

Scheffé post hoc calculations reveal no significant effect for discipline on willingness ($p > .05$). The analysis also yielded no statistically significant differences between groups for job title with respect to concussion knowledge ($p > .05$).

Discussion

Concussion management has shifted its focus to examining RTL in the classroom, however the current knowledge and willingness to provide accommodations in the post-secondary setting is unclear in those with roles to support the student's reintegration into the classroom. Therefore, this study was designed to determine academic advisors' and college professors' knowledge of concussions and their willingness to provide academic accommodations to students recovering from a concussion. Based on previous literature, it was hypothesized 1) academic advisors and professors have a low level of concussion knowledge, 2) there will be a positive relationship between level of concussion knowledge and willingness to provide academic accommodations, and 3) participants from the health and education disciplines will be more willing to provide academic accommodations.

Research has made it evident that school personnel play a role in concussion management, though minimal research has examined concussion knowledge of college faculty and staff as a whole. The one-way ANOVA revealed no statistically significant difference in knowledge scores with respect to participants' job title. This was not consistent with previous research that found educators had a lack of concussion knowledge. Previous studies such as Dreer et al., established that most educators did not feel confident or knowledgeable about concussions. While they were able to determine basic concussion symptoms, the majority of participants expressed a need for better concussion education and training.[8] The current study revealed participants average knowledge score was 22/29 (75.8%), which is consistent with Lin

et al., reported a mean average of 73.6% correct on knowledge. Despite 90.4% having received no previous concussion education, participants' knowledge scores were still consistent with other studies.[63,64] Many of those who reported having concussion education, obtained it through being involved with sports in some capacity or through education required for their career rather than as a part of their employment.

While we expected lower levels of concussion knowledge for college professors and academic advisors, it appears that they have basic knowledge consistent with previous literature in adults working with concussed individuals. Although general concussion knowledge is present, it is unknown what acceptable levels of knowledge are and what would be considered good knowledge. In many instances, a 75% would likely not be considered "good" concussion knowledge, but for the role that school personnel play, 75% may be enough. Therefore, further research is needed to determine appropriate knowledge levels in order to guide future concussion management on the implementation of education.

Research suggests that education for school personnel is often times overlooked and is only provided to parents, coaches and athletes.[7] Specifically, in the collegiate setting, the NCAA only requires education to athletes and coaches.[5] The current study supports that without specific concussion education, college professors and academic advisors have basic concussion knowledge without additional training. While professors and academic advisors appear to have concussion knowledge, the link between knowledge and willingness to accommodate should be further examined.

After careful search of the literature, we expected a strong positive relationship between concussion knowledge and willingness to provide accommodations. Several accommodations revealed significant correlations: extra time on an exam, postponing a test date, alternative

formats of assignments, and allowing sunglasses in the classroom. Providing extra time on an exam was consistent with Skinner (2007), where faculty were more receptive to accommodations allowing extra time. In a study examining faculty willingness to provide accommodations to students with learning disabilities, accommodations such as allowing students to tape record lectures, printed copies of lectures, and completing alternative assignments were highly favored.[65] Therefore, it was anticipated that the current faculty would also favor these accommodations for a concussion, although alternative assignments was the only significant finding. Previous studies reveal that a lack of knowledge regarding concussion symptoms can affect concussion management among school personnel. However, that was not found in the current study. This finding could be attributed to the fact that all participants were willing to provide accommodations regardless of their knowledge, although it is possible the inconsistent findings are a result of the current sample having sufficient basic knowledge. This may have led to a restricted range based upon the fact our sample may not have captured everyone with the potential to implement accommodations. On the contrary, Skinner 2007, stated faculty with a greater understanding of the desired need for accommodations was positively associated with willingness to provide said accommodations. While the current participants had basic concussion knowledge and were willing to provide accommodations, the majority of the analysis revealed no significant correlation between the two factors.

Results from previous studies revealed academic discipline as a common factor influencing faculty willingness for students with learning disabilities, leading us to believe similar patterns would present for concussions.[17,20] A MANOVA examined potential differences in willingness by job title and discipline. Initially, a significant main effect was found between discipline and willingness to accommodate, however post-hoc testing revealed that engineering

and public health obtained lower concussion knowledge scores (Table 4), however low sample sizes in Engineering and Public Health resulted in low effect sizes and power to support significance. Skinner 2007 and Rao 2003, both suggested academic discipline as an influencing factor on school personnel to provide accommodations for students with concussions or learning disabilities. The same two groups of researchers reported that faculty of the education discipline were more willing than any other discipline.[17,20] Faculty of the health professions also reported being more willing to provide accommodations over other disciplines.[17] Based on the previous literature, it was anticipated that the educational and health professions would be more willing to provide accommodations based on their discipline background. However, the educational discipline was only represented by 12.7% of the sample and 19.5% was of the health science discipline. The arts and humanities had previously been found to be less willing than other faculty, though they provided the largest representation at 22.9%. Although previous literature indicated discipline as an influencing factor for willingness, the current study found that discipline did not matter, and all faculty were willing to provide accommodations. This suggest a lack of biases based on discipline indicating that all professors and advisors would provide accommodations to students in the current sample. In essence, among this sample, students would receive the appropriate care they need for a healthy recovery. Increased concussion incidents rates have led to the increased likelihood that college faculty will be exposed to students with concussions, therefore, it is vital they are provided the best environment to maintain their academics. Guidelines have been established within the educational setting to ensure proper RTL, however, academic advisors and professors at the collegiate setting must be knowledgeable in the matter and willing to provide accommodations for this RTL to be successful.

Limitations

While this study found that advisors and professors had basic concussion knowledge and all were willing to provide accommodations, it is not without limitations. First, the study examined a convenience sample from one university resulting in small sample sizes across disciplines. As the research is limited on collegiate RTL protocols, this study provides the first examination of University professors and advisors knowledge and willingness to provide accommodations. Second, research suggests that personal experience with concussion will increase concussion knowledge. This study did not examine personal experience with concussions which could have influenced response bias. Those who may have played sports and sustained a concussion may be more knowledgeable and understanding about the topic, potentially inflating knowledge scores. Lastly, response bias could have enhanced recruiting of participants that had limited concussion knowledge and/or were willing to provide accommodations. It appears that the results are heavily skewed to participants that were willing to provide accommodations. Despite the limitations of this study, the authors learned that academic advisors and professors in this sample do have basic concussion knowledge and were willing to provide academic accommodations.

Conclusions and educational implications

This study found that academic advisors and professors had basic concussion knowledge and were all willing to provide academic accommodations regardless of influencing factors such as job title or discipline. The findings of this study provide evidence about concussion knowledge and willingness to provide academic accommodations in a population that is not often studied. Without prior formal concussion education, faculty and academic advisors had a basic understanding of concussion signs and symptoms and yielded basic concussion knowledge. While basic yearly concussion education may not be as important for school personnel, it is

likely that further education on the RTL process and classroom management for concussions is warranted. Contrary to what was hypothesized, academic advisors and professors were willing to make academic accommodations for students with concussive injuries, regardless of concussion knowledge. Similarly, despite educational background and discipline, all participants were willing to provide academic accommodations to students with a concussion.

RTL polices are slowly being incorporated into school settings and have been crucial to the progression of concussion management, however few of them have been implemented in the collegiate setting. While it would be beneficial to have guidelines in this setting, they may not necessarily promote academic support for the recovering student which is paramount for their concussion recovery and academic success. If those responsible for implementing academic accommodations are unaware of the importance of accommodations, their role in providing academic support, or are unwilling or uncomfortable providing them, the policy's benefits are limited. The lack of this knowledge and willingness ultimately provides negative repercussions that is unfair to the student trying to manage a serious injury and maintain academia. Future studies should aim for a large sample size across multiple universities to acquire a diverse population in order to ensure that basic concussion knowledge is consistent throughout a variety of universities. A larger sample size would also provide better insight on the relationship of discipline and willingness to provide accommodations. Further evaluation is necessary to determine if this population can actually individualize concussion management and implement which specific academic accommodations might be needed for each student.

Table One: Participant Demographic Information

		Academic Advisor		Professor	
		Frequency	Percent	Frequency	Percent
Race	African American	4	11.4	9	4.4
	Hispanic	1	2.9	7	3.4
	White or Caucasian	28	80	174	84.9
	Asian	0	0	5	2.4
	Other	0	0	2	1
	Prefer not to answer	2	5.7	8	3.9
	Total	35	100	205	100
Gender	Male	5	14.3	79	38.5
	Female	30	85.7	126	61.5
	Total	35	100	205	100
Academic Advisor Department	General Population	33	94.3	N/A	N/A
	Athletics	2	5.7	N/A	N/A
	Total	35	100	N/A	N/A
Discipline	Arts and Humanities	N/A	N/A	47	22.9
	Behavioral and Social Sciences	N/A	N/A	30	14.6
	Business	N/A	N/A	19	9.3
	Education	N/A	N/A	26	12.7
	Engineering and Computing	N/A	N/A	2	1
	Health Professions	N/A	N/A	40	19.5
	Public Health	N/A	N/A	10	4.9
	Science and Mathematics	N/A	N/A	31	15.1
	Total	35	100	205	100
Total years of Exp	1-4 years	28	80	28	13.7
	5-9 years	6	17.1	48	23.4
	10-14 years	1	2.9	38	18.5
	15-19 years	0	0	27	13.2
	20+ years	0	0	64	31.2
	Total	35	100	205	100
Years at University	1-2 years	13	37.1	28	13.7
	3-4 years	9	25.7	36	17.6
	5-6 years	7	20	36	17.6
	6-8 years	4	11.4	20	9.8
	9-10 years	1	2.9	45	22
	11+ years	1	2.9	40	19.5
	Total	35	100	205	100

Class Structure	Face to face classes	13	8.6	110	53.7
	Online Classes	0	0	12	5.9
	Both	3	37.1	82	40
	N/A	19	54.3	1	0.5
	Total	35	100	205	100
Knowledge of SARC	Yes	34	97.1	199	97.1
	No	1	2.9	6	2.9
	Total	35	100	205	100
Aware of Concussion Management policy	Yes	5	14.3	197	96.1
	No	30	85.7	8	3.9
	Total	35	100	205	100
Academics increase Concussion Symptoms	Yes	32	91.4	183	89.3
	No	5	8.6	22	10.7
	Total	35	100	205	100
Students Need AA	Yes	32	91.4	200	97.6
	No	3	91.4	5	2.4
	Total	35	100	205	100
Play a role in RTL	Yes	30	85.7	191	93.2
	No	5	14.3	14	6.8
	Total	35	100	205	100
Willing to provide AA	Yes	33	94.3	202	98.5
	No	2	5.7	3	1.5
	Total	35	100	205	100
Experience providing established AA	Yes	3	8.6	46	22.4
	No	32	91.4	159	77.6
	Total	35	100	205	100
Comfort providing AA	Yes	22	62.9	114	55.6
	No	13	17.1	91	44.4
	Total	35	100	205	100
Experience providing own AA	Yes	3	8.6	48	23.4
	No	32	91.4	157	76.6
	Total	35	100	205	100
Received Concussion Education	Yes	4	11.4	19	9.3
	No	31	88.6	186	90.7
	Total	35	100	205	100

Table Two: Frequencies of each individual accommodation based on the Likert Scale with 1 being unwilling and 5 being willing to provide the accommodation.

Academic Accommodations	Likert Scale				
	1	2	3	4	5
Tape record lectures	2.1	2.1	4.2	8.3	83.3
Printed Copies of Lectures	7.1	3.3	13.3	9.6	66.7
Extended Deadlines	0.8	0.8	3.8	13.3	81.3
Alternative Assignments	9.2	9.2	20.8	17.9	42.9
Alternative Exams	7.9	7.1	20	20	45
Extra Time on Exams	0.4	0.4	3.3	7.5	88.3
Postponed Test Dates	1.7	0.4	4.6	12.9	80.4
Excused Absence	1.7	0.4	4.6	12.9	80.4
Sunglasses in the Classroom	0.8	0.4	2.9	5.4	90.4
Alternative Testing Location	0.4	0	2.9	7.5	89.2
Use of Note Taker	0.4	0.4	1.3	7.9	90
Alternative Class Materials	4.6	6.7	10.8	13.3	64.6

Table Three: Concussion Knowledge and Willingness Correlation Results

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
Total Knowledge	---												
Extra Time	.160*	---											
Postponed Test Date	.161*	.540**	---										
Tape Recorded Lectures	.032	.412**	.255**	---									
Printed Copies of Notes	.035	.156*	.198*	.112	---								
Extended Deadlines on Assignments	.125	.532**	.591**	.274**	.274**	---							
Alternative Assignments	.161*	.225**	.313**	.130*	.419**	.337**	---						
Alternative Exam Formats	.076	.262**	.246**	.232**	.385**	.311**	.752**	---					
Excused Absence	.063	.471**	.489**	.388**	.203**	.458**	.288	.273**	---				
Allowing Sunglasses	.135*	.605**	.533**	.380**	.185**	.627**	.200**	.204	.588**	---			
Alternative Testing Location	.102	.642**	.477**	.374**	.092	.415**	.132*	.157*	.475**	.615**	---		
Use of Note Taker	.049	.549**	.400**	.459**	.147*	.449**	.117	.140*	.450**	.621**	.651**	---	
Alternative Class Material	.101	.268**	.390**	.200*	.697**	.408**	.534**	.527**	.380**	.318**	.247**	.266**	---

Table Four: Engineering and computing and public health mean concussion knowledge scores

Discipline	N	Mean	Standard Deviation
Engineering and Computing	2	20.00	.000
Public Health	10	21.20	2.34

CHAPTER FOUR

DISCUSSION

The incidence rates of concussive injuries are steadily climbing, potentially resulting in rising a number of students who may find difficulty re-integrating into the classroom. Signs and symptoms of a concussion can negatively impact students' abilities to attend classes and complete academic task. Thus, an appropriate return to the classroom is key during concussion management to allow for healing while maintaining academic responsibilities. Many consensus statements and protocols recommend a gradual return to the classroom utilizing academic accommodations to support positive recovery outcomes. Academic advisors and professors play critical roles in implementing accommodations, however they may not be educated or trained in this area.

RTL polices are slowly being incorporated into school settings and have been crucial to the progression of concussion management, however few of them have been implemented in the collegiate setting. While it would be beneficial to have guidelines in this setting, they may not necessarily promote academic support for the recovering student which is paramount for their concussion recovery and academic success. If those responsible for implementing academic accommodations are unaware of the importance of accommodations, their role in providing academic support, or are unwilling or uncomfortable providing them, the policy's benefits are limited. The lack of this knowledge and willingness ultimately provides negative repercussions that is unfair to the student trying to manage a serious injury and maintain academia.

While the current study is one of the first to examine University professors and advisor's knowledge and willingness to provide accommodations, further evaluation on the topic is necessary. Future studies should aim for a large sample size across multiple universities to acquire a diverse population in order to validate that basic concussion knowledge is consistent

through a variety of universities. A larger sample size would also provide better insight on the relationship of discipline and willingness to provide accommodations. Additionally, research should further examine if this population can individualize concussion management and implement specific academic accommodations needed for each student. Faculty being knowledgeable and willing to provide accommodations is important, but there could still be disconnect if they are unable to make enough connection to implement said accommodations. Determining faculties ability to carry out academic accommodations throughout the RTL process allows for researchers to shape concussion education and management based off the faculties need.

REFERENCES

1. Lincoln A, Caswell S, Almquist J, Dunn R, Norris J, Hinton R. Trends in concussion incidence in high school sports: A prospective 11-year study. *The American Journal of Sports Medicine*. 2011;39(5):958-963.

2. Broglio SP, Cantu RC, Gioia GA, et al. National Athletic Trainers' Association position statement: Management of sport concussion. *Journal of Athletic Training*. 2014;49(2):245-265.

3. McGrath N. Supporting the student-athlete's return to the classroom after a sport-related concussionwill. *Journal of Athletic Training*. 2010;45(5):492-498.

4. Williamson CL, Norte GE, Broshek DK, Hart JM, Resch JE. Return to learn after sport-related concussion: A survey of secondary school and collegiate athletic trainers. *Journal of Athletic Training*. 2018;53(10):990-1003.

5. Kerr ZY, Snook EM, Lynall RC, et al. Concussion-related protocols and preparticipation assessments used for incoming student-athletes in National Collegiate Athletic Association member institutions. *Journal of Athletic Training*. 2015;50(11):1174-1181.

6. Thompson LL, Lyons VH, McCart M, Herring SA, Rivara FP, Vavilala MS. Variations in state laws governing school reintegration following concussion. *PEDIATRICS*. 2016;138(6):e20162151-e20162151.

7. Sady MD, Vaughan CG, Gioia GA. School and the concussed youth: Recommendations for concussion education and management. *Physical Medicine and Rehabilitation Clinics of North America*. 2011;22(4):701-719.

8. Dreer LE, Crowley MT, Cash A, O'Neill JA, Cox MK. Examination of teacher knowledge, dissemination preferences, and classroom management of student concussions: Implications for return-to-learn protocols. *Health Promotion Practice*. 2017;18(3):428-436.

9. McCrory P. Summary and agreement statement of the 2nd International conference on concussion in sport, Prague 2004. *British Journal of Sports Medicine*. 2005;39(Supplement 1):78-86.

10. Master CL, Gioia GA, Leddy JJ, Grady MF. Importance of 'return-to-learn' in pediatric and adolescent concussion. *Pediatric Annals*. 2012;41(9):e160-e166.

11. Carson JD, Lawrence DW, Kraft SA, et al. Premature return to play and return to learn after a sport-related concussion. *Can Fam Physician*. 2014;60(6):e310-e315.

12. DeMatteo C, Stazyk K, Giglia L, et al. A balanced protocol for return to school for children and youth following concussive injury. *Clinical Pediatrics*. 2015;54(8):783-792.

13. Frost G, Connolly M. Education: Strategies based on principles of UDL. *Collect Essays on Learning and Teaching*. 2018;11:109-117.

14. Johnson LBR, McGinty GT, Ramsey TM, Hjalber M, Hill CTE. Return-to-learn: A post-concussion academic recovery program at the U.S. Air Force Academy. *MILITARY MEDICINE*. 2018;183:1-4.

15. Popoli DM, Burns TG, Meehan WP, Reisner A. CHOA concussion consensus: Establishing a uniform policy for academic accommodations. *Clinical Pediatrics*. 2014;53(3):217-224.

16. deBettencourt LU. Understanding the differences between IDEA and Section 504. *TEACHING Exceptional Children*. 2002;34(3):16-23.

17. Rao S. Attitudes of university faculty toward accommodations to students with disabilities. 2003;25(2):47-54

18. Comparison of the Individuals with Disabilities Education Act (IDEA), Section 504 of the Rehabilitation Act (Section 504), The American with Disabilities Act (ADA), and The Elementary and Secondary Education Act (also known as No Child Left Behind Act of 2001- NCLB '01). 2005:1-2.

19. Halstead ME, McAvoy K, Devore CD, et al. Returning to learning following a concussion. *PEDIATRICS*. 2013;132(5):948-957.

20. Skinner ME. Factuly willingness to provide accommodations and course alternatives to postsecondary students with learning disabilities Mc. *INTERNATIONAL JOURNAL OF SPECIAL EDUCATION*. 2007;22:14.

21. McCrory P, Meeuwisse W, Dvorak J, et al. Consensus statement on concussion in sport—the 5 International conference on concussion in sport held in Berlin, October 2016. *British Journal of Sports Medicine*. 2017;51:838-847

22. Aubry M, Cantu R, Dvorak J, et al. Summary and agreement statement of the first International conference on concussion in sport, Vienna 2001. *The Physician and Sportsmedicine*. 2002;30(2):57-63.

23. Majerske CW, Mihalik JP, Ren D, et al. Concussion in sports: Postconcussive activity levels, symptoms, and neurocognitive performance. 2008;43(3):265-274.

24. Zuckerman SL, Kerr ZY, Yengo-Kahn A, Wasserman E, Covassin T, Solomon GS. Epidemiology of sports-related concussion in NCAA athletes from 2009-2010 to 2013-2014: Incidence, recurrence, and mechanisms. *The American Journal of Sports Medicine*. 2015;43(11):2654-2662.

25. Langlois JA, Rutland-Brown W, Wald MM. The epidemiology and impact of traumatic brain injury: A brief overview. *The Journal of Head Trauma Rehabilitation*. 2006;21(5):375.

26. Gessel LM, Fields SK, Collins CL, Dick RW, Comstock RD. Concussions among United States high school and collegiate athletes. *J Athl Train*. 2007;42(4):495-503.

27. Baugh CM, Kroshus E, Bourlas A, Perry K. Requiring athletes to acknowledge receipt of concussion-related information and responsibility to report symptoms: A study of the prevalence, variation, and possible improvements. *Journal of Law, Medicine, and Ethics*. 2014;42(3):297-313.

28. Beidler E, Bretzin AC, Hanock C, Covassin T. Sport-related concussion: Knowledge and reporting behaviors among collegiate club-sport athletes. *Journal of Athletic Training*. 2018;53(9):866-872.

29. McNeal L, Selekmen J. Guidance for return to learn after a concussion. *NASN School Nurse*. 2017;32(5):310-316.

30. Harmon KG, Drezner JA, Gammons M, et al. American Medical Society for sports medicine position statement: Concussion in sport. *British Journal of Sports Medicine*. 2013;47(1):15-26.

31. Hunt TN, Asplund C. Concussion assessment and mangement. *Clinics in Sports Medicine*. 2010;1:5-17.

32. Alla S, Sullivan SJ, Hale L, McCrory P. Self-report scales/checklists for the measurement of concussion symptoms: A systematic review. *British Journal of Sports Medicine*. 2009;43(Suppl_1):i3-i12.

33. McCrea M. Standardized mental status assessment of sports concussion. *Clinical Journal of Sport Medicine*. 2001;11(3):176-181.

34. Broglio SP, Macciocchi SN, Ferrara MS. Neurocognitive performance of concussed athletes when symptom free. *Journal of Athletic Training*. 2007;42(4):504-508.

35. McCrory P, Meeuwisse W, Johnston K, et al. Consensus statement on concussion in sport - the 3rd International conference on concussion in sport held in Zurich, Novemeber 2008. *SAJAM*. 2009;21(2):i46-i50.

36. Baker JG, Leddy JJ, Darling SR, et al. Factors associated with problems for adolescents returning to the classroom after sport-related concussion. *Clinical Pediatrics*. 2015;54(10):961-968.

37. McCrory P, Meeuwisse WH, Aubry M, Cantu B. Consensus statement on concussion in sport: the 4th International conference on concussion in sport held in Zurich, November 2012. *British Journal of Sports Medicine*. 2013;47(5):250-258.

38. Bompadre V, Jinguji TM, Yanez ND, et al. Washington State's Lystedt Law in concussion documentation in Seattle public high schools. *Journal of Athletic Training*. 2014;49(4):486-492.

39. Concussion safety protocol Management | NCAA.org - The Official Site of the NCAA. http://www.ncaa.org/sport-science-institute/concussion-safety-protocol-management. Accessed February 22, 2020.

40. Fedor A, Gunstad J. Limited knowledge of concussion symptoms in college athletes. *Applied Neuropsychology: Adult*. 2015;22(2):108-113.

41. Kasamatsu T, Cleary M, Bennett J, Howard K, McLeod TV. Examining academic support after concussion for the adolescent student-athlete: Perspectives of the athletic trainer. *Journal of Athletic Training*. 2016;51(2):153-161.

42. Return-to-school strategy | Parachute's Horizon. http://horizon.parachutecanada.org/en/article/parachutes-return-to-learn-protocol/. Published 2018. Accessed May 24, 2019.

43. Stachowiak JR. Universial design for learning in postsecondary institutions. *New Horizions for Learning*. 2010;8(1).

44. Boothe KA, Lohmann MJ, Donnell KA, Hall DD. Applying the principles of universal design for learning (UDL) in the college classroom. *JOSEA*. 2018;7(3):13.

45. Kirelik SB, McAvoy K. Acute concussion management with Remove-reduce/educate/adjust-accommodate/Pace (REAP). *The Journal of Emergency Medicine*. 2016;50(2):320-324.

46. Iowa concussion consortium. *Brain Injury Alliance of Iowa*. 2019. https://biaia.org/icc/. Accessed May 24, 2019.

47. Hatcher S, Waguespack A. Academic accommodations for students with disabilites. *National Association of Psychologist*. 2004:1-4.

48. Tucker BP. The Americans with Disabilities Act of 1990: An overview. *New Mexico Law Review*. 1992;22(13):13-118.

49. Hurley B. Accommodating learning disabled students in higher education: Schools' legal obligations under Section 504 of the Rehabilitation Act. 1991;32:1051-1103.

50. Madaus JW, Shaw SF. Section 504: Differences in the regulations for secondary and postsecondary education. *Intervention in School and Clinic*. 2004;40(2):81-87.

51. Lipkin PH, Okamoto J, the COUNCIL ON CHILDREN WITH DISABILITIES and COUNCIL ON SCHOOL HEALTH. The Individuals with Disabilities Education Act (IDEA) for children with special educational needs. *PEDIATRICS*. 2015;136(6):e1650-e1662.

52. Williams RM, Welch CE, Parsons JT, McLeod TCV. Athletic Trainers' familiarity with and perceptions of academic accommodations in secondary school athletes after sport-related concussion. *Journal of Athletic Training*. 2015;50(3):262-269. doi:10.4085/1062-6050-49.3.81

53. Thurlow M, Bolt S. Empirical support for accommodations most often allowed in state policy. *National Center on Educational Outcomes*. 2001.

54. Graff DM, Caperell KS. Concussion management in the classroom. *Journal of Child Neurology*. 2016;31(14):1569-1574.

55. Rose S, McNally K, Heyer G. Returning the student to school after concussion: what do clinicins need to know? 2015;1(1).

56. Migden J. The professional advisor. *NACADA Journal*. 1989;9(1):63-68.

57. Classification of ranks and titles » Faculty Handbook | Boston University. https://www.bu.edu/handbook/appointments-and-promotions/classification-of-ranks-and-titles/. Accessed May 25, 2019.

58. Faculty ranks, appointment tracking, and working title guidelines. *Academic Personnel*. https://academicpersonnel.unc.edu/faculty-policies-procedures-guidelines/faculty-appointments/. Accessed May 25, 2019.

59. Preece JE, Roberts NL, Beecher ME, Rash PD, Shwalb DA, Martinelli EA. Academic advisors and students with disabilities: A national survey of advisors' experiences and needs. 2007;27:16.

60. Carzoo SA, Young JA, Pommering TL, Cuff SC. An evaluation of secondary school educators' knowledge of academic concussion management before and after a didactic presentation. *Athletic Training & Sports Health Care*. 2015;7(4):144-149.

61. Purcell LK, Canadian Paediatric Society, Healthy Active Living and Sports Medicine Committee. Sport-related concussion: Evaluation and management. *Paediatrics & Child Health*. 2014;19(3):153-158.

62. Hall EE, Ketcham CJ, Crenshaw CR, Baker MH, McConnell JM, Patel K. Concussion management in collegiate student-athletes: Return-to-academics recommendations. *Clinical Journal of Sport Medicine*. 2015;25(3):291.

63. Lin AC, Salzman GA, Bachman SL, et al. Assessment of parental knowledge and attitudes toward pediatric sports-related concussions. *Sports Health*. 2015;7(2):124-129.

64. Salway CC. Concussion knowledge and understanding in GHSA guardians. 2018:98.

65. Vogel S, Leyser Y. Students with learning disabilites in higher education: Faculty attitude and practices. *Learning Disabilites Research & Practice*. 2000;14(3):173-186.

65. Cook C, Heath F, Thompson RL. A meta-analysis of response rates in web- or internet-based surveys. *Educational and Psychological Measurement*. 2000;60(6):821-836.

APPENDIX A

EXTENDED METHODS

Research Questions:

1) What is the level of knowledge academic advisors and professors have of concussion?

2) Is there a relationship between academic advisors and professor's concussion knowledge and willingness to provide academic accommodations?

3) What is the effect of discipline and position in regard to academic advisors and professor's willingness to provide academic accommodations?

Hypotheses

1) academic advisors and professors have a low level of concussion knowledge

2) there will be a positive relationship between level of concussion knowledge and willingness to provide academic accommodations

3a) Participants from the health and education disciplines will be more willing to provide academic accommodations

3b) there will be an interaction between academic position and willingness to provide academic accommodations.

Procedures:

An initial pilot study would be conducted via email. After completion of a review by experts to ensure content validity, a secondary group similar to the participants of interest will complete the survey examining allotted time needed and clarity of the questions. Participants will mimic those who will be selected for the full-scale study; however, they will not be associated with Georgia Southern University. Participants from the pilot study will provide feedback on the

survey so potential edits can be made for the full-scale study. After pilot testing has been completed, permission from the president's cabinet to utilize GSU emails will be obtained.

Upon obtaining approval from the Institutional Review Board (IRB), we will obtain written approval from the university presidents' cabinet while the survey will be reviewed by the Office of Strategic Research & Analysis (OSRA). A request for permission to use the emails will be completed and submitted to OSRA along with a copy of IRB approval. After required permissions are obtained, an initial email will be sent to the target population using participants' Georgia Southern University affiliated email addresses. The initial email will provide information regarding the study including the purpose and importance of the survey, inclusion and exclusion criteria, as well as a link to the online survey. The survey link will be available to participants for a total of 2 months to allow for the ability to respond at their convenience. A reminder email will be sent at two-week intervals over the course of the 8 weeks encouraging participants to complete the survey. Ideally, a response rate of 30-40% is desired.[66]

Limitations

Research suggests that personal experience with concussion will increase concussion knowledge. This study did not examine personal experience with concussions which could have influenced response bias. Those who may have played sports and sustained a concussion may be more knowledgeable and understanding about the topic. Lastly, response bias could have enhanced recruiting of participants that had limited concussion knowledge and/or were willing to provide accommodations. It appears that the results are heavily skewed to participants that were willing to provide accommodations. Had this population responded, more variation may have been brought to the study eliminating some bias.

Delimitations

The survey was limited to a convenience sample at one university. As the research is limited on collegiate return to learn protocols, this study provides the first examination of University professors and advisors knowledge and willingness to provide accommodations.

Assumptions

This study was completed with the assumption that all participants knew the definition of concussion and academic accommodations. Additionally, it was assumed that all participants answered the survey questions honestly, accurately, and to the best of their ability.

APPENDIX B

IRB DOCUMENTS

GEORGIA SOUTHERN UNIVERSITY
OFFICE OF RESEARCH INTEGRITY

Institutional Review Board (IRB)

Application for Research Approval – Expedited/Full Board

For Office Use Only: Protocol ID

Please submit this protocol to IRB@georgiasouthern.edu in a single email; scanned signatures and official Adobe electronic signatures are accepted. Applications may also be submitted via mail to the Georgia Southern University Office of Research Integrity, PO Box 8005.

Principal Investigator	
PI's Name: Loriann Tedder	Phone: 919-521-6223
Email: lt08477@georgiasouthern.edu (Note: Georgia Southern email addresses will be used for all correspondence.)	Department: Health Sciences & Kinesiology College: WCHP
Primary Campus: ☒ Statesboro Campus ☐ Armstrong Campus ☐ Liberty Campus	
☐ Faculty ☐ Doctoral ☐ Specialist ☒ Masters ☐ Undergraduate ☐ Other:	
Georgia Southern Co-Investigator(s)	
Co-I's Name(s): Dr. Tamerah Hunt (F), Dr. Jody Langdon (F), Dr. George Shaver (F) (By each name indicate: F(Faculty), D(Doctoral), S(Specialist), M(Masters), U(Undergraduate), O(Other)	Email: thunt@georgiasouthern.edu jlangdon@georgiasouthern.edu gwshaver@georgiasouthern.edu (Note: Georgia Southern email addresses will be used for all correspondence.)
Personnel and/or Institutions Outside of Georgia Southern University involved in this research:	
	☐ Training Attached ☐ IRB Approval Attached ☐ intent to rely on GS
	☐ Training Attached ☐ IRB Approval Attached ☐ intent to rely on GS

Project Information
Title: Knowledge and willingness of academic advisors and college professors regarding concussion and academic accommodations.
Number of Subjects (Maximum) 500
Will you be using monetary incentives (cash and/or gift cards)? ☐ Yes ☒ No
Funding Source: ☐ Federal ☐ State ☐ Private ☐ Internal GS (enter source below) ☒ Self-funded/non-funded Funding Agency/ GS Source: Grant Number: Grant Title: ☐ Same as above Enter here:
Compliance Information
Do you or any investigator on this project have a financial interest in the subjects, study outcome, or project sponsor? (A disclosed conflict of interest will not preclude approval. An undisclosed conflict of interest will result in disciplinary action.). ☐ Yes ☒ No (If yes attach disclosure form)

Certifications
I certify that the statements made in this request are accurate and complete, and if I receive IRB approval for this project, I agree to inform the IRB in writing of any emergent problems or proposed procedural changes. I agree not to proceed with the project until the problems have been resolved or the IRB has reviewed and approved the changes. It is the explicit responsibility of the researchers and supervising faculty/staff to ensure the well-being of human participants. At the conclusion of the project I will submit a report. A report must be submitted no later than 12 months after project initiation. _____ Signature of Primary Investigator Date _____ Signature of Co-Investigator(s) Date By signing this cover page I acknowledge that I have reviewed and approved this protocol for scientific merit, rational and significance. I further acknowledge that I approve the ethical basis for the study. If faculty project, enter department chair's name; if student project, enter research advisor's name: Dr. Tamerah Hunt _____ Signature of Department Chair or Research Advisor Date

Compliance Information	
Please indicate which of the following will be used in your research: (applications may be submitted simultaneously)	
☒ Human Subjects ☐ Care and Use of Vertebrate Animals (Submit IACUC Application) ☐ Biohazards (Submit IBC Application)	
Please indicate if the following are included in the study (Check all that apply):	
☒ Survey delivered by email to .georgiasouthern.edu addresses ☐ Deception ☐ Prisoners ☐ Children ☐ Individuals with impaired decision making capacity, or economically or educationally disadvantaged persons	☐ Video or Audio Recordings ☐ Human Subjects Incentives ☐ Medical Procedures, including exercise, administering drugs/dietary supplements, and other procedures, or ingestion of any substance
Is your project a research study in which one or more human subjects are prospectively assigned to one or more interventions (which may include placebo or other control) to evaluate the effects of those interventions on health-related biomedical or behavioral outcomes. See the IRB FAQ for help with the definition above. ☐ Yes ☒ No If yes, attach Good Clinical Practice (GCP) CITI training appropriate to the project.	

1. Personnel
Please list any individuals who will be conducting research on this study. Also, please detail the experience, level of involvement in the process, and the access to information that each may have.
Loriann Tedder (Primary Investigator): Will be collecting all data and have access to all information regarding the study Dr. Tamerah Hunt (Co-Investigator): High level of involvement in the study, will aid in data collection and data analysis as well as have access to all information regarding the study

Dr. Jody Langdon (Co-Investigator): High level of involvement in the study, will aid in data collection and data analysis as well as have access to all information regarding the study
Dr. George Shaver (Co-Investigator): High level of involvement in the study, will aid in data collection and data analysis as well as have access to all information regarding the study

2. Purpose

A. Briefly describe in one or two sentences the purpose of your research.

The overarching purpose of this study is to determine academic advisors and college professors' knowledge of concussions and their willingness to provide academic accommodations to students recovering from a concussion. This will be accomplished by examining the relationship between knowledge and willingness to provide academic accommodations to students as well as examining the effect of rank and department on willingness to provide academic accommodations.

B. What questions are you trying to answer in this project? Please include your research question in this section. The jurisdiction of the IRB requires that we ensure the appropriateness of research. It is unethical to put participants at risk without the possibility of sound scientific result. For this reason, you should be very clear about how participants and others will benefit from knowledge gained in this project.

What is the level of concussion knowledge present in academic advisors and professors?

Is there a relationship between academic advisors and professor's concussion knowledge and willingness to provide academic accommodations?

What is the effect of discipline and academic position in regard to academic advisors and professor's knowledge and willingness to provide academic accommodations?

C. Provide a brief description of how this study fits into the current literature. Have the research procedures been used before? How were similar risks controlled for and documented in the literature? Have your instruments been validated with this audience? Include citations in the description. Do not include dissertation or thesis chapters.

Concussions, also known as mild traumatic brain injuries, are a growing topic of discussion as more people are participating in all levels of sports, increasing occurrence rates. In 2014, the National Athletic Trainers Association provided a position statement defining concussion as "a traumatic induced alteration in mental status that may or may not involve a loss of consciousness" [2]. As of 2009, all 50 states had state laws on return to play (RTP), however, in 2016 only 8 states had established return to learn (RTL) laws, all of which had varying aspects mainly focusing on student athletes rather than the general population [6]. A study conducted by Kerr et al., (2015), found that RTL policies were only implemented in 207 out of 327 (63%) of NCAA universities studies, with only 3.1% of those addressing academic support to help manage concussed athletes. Despite the lack of academic support provided to students completing the return to learn transition, it is paramount for their concussion recovery and academic success.

Development of RTL policies has been crucial to the progression of concussion management; however, their benefits may be limited if those responsible for providing care and support are unaware of the current polices. School personnel such as academic advisors or professors are often those responsible for implementing reasonable academic accommodations and managing students' full integration back into the classroom. Academic advisors and professors must have a good understanding of the gradual return process to help ensure the proper implementation of academic accommodations for students recovering from a concussion. Typically, academic accommodations are provided to students with learning disabilities, however, they are equally valuable to students with a concussion. The American Medical Society of Sports Medicine has defined academic accommodations provided during concussion recovery as reducing workload, extended test time, days off or a shortened work day [15]. Academic accommodations are provided to offer support to the recovering student in maintaining academic demands in a way that does not stress cognitive functioning and worsen symptoms [3]. Common accommodations to concussed students include but are not limited to: excused absence from classes, rest periods during the day, assignment extensions, postponement of tests, extended test time, accommodations for sensitivity to light or noise, excusal from physical activities, allowing a note taker, and alternate formats of assignments [3]. Academic advisors and professors play a major role in helping provide this assistance to those recovering from concussions who are in need of academic support. Educators have a direct connection with the students education, therefore, it is important for them to understand the effects of a concussion and how they can assist in concussion recovery by reducing cognitive demands

[19]. While they have the ability to provide academic accommodations, they also must be willing to provide those accommodation to students in need. Despite the direct connection, educators may be unaware of this responsibility and how to provide assistance during this process.

Concussion occurrence rates have drastically increased leading to the examination of concussion management. Existing research regarding concussion management has primarily focused on return to play, with little reference to return to learn. Emphasis on return to learn is slowly gaining significance with knowledge about the importance of cognitive rest and a gradual return to the classroom. Return to learn polices are slowly being incorporated into school settings, however few of them have been implemented in the collegiate setting. While it is beneficial having return to learn guidelines, they do not necessarily promote academic support for the recovering student. If those responsible for implementing academic accommodations are unaware of the importance of accommodations, their role in providing academic support, or are unwilling or uncomfortable providing them, the policy's benefits are limited. Gaining an understanding of the familiarity that academic advisors and college professors have regarding concussion management in the classroom, could allow for adjustments in educational plans needed to provide a smoother transition to the classroom for recovering students. Therefore, the purpose of this study is to determine academic advisors and college professors' knowledge of concussion and the return to learn process, as well as their willingness to provide academic accommodations to students recovering from a concussion.

3. Outcome

Please state what results you expect to achieve. Who will benefit from this study? How will the participants benefit (if at all)? Remember that the participants do not necessarily have to benefit directly. The results of your study may have broadly stated outcomes for a large number of people or society in general.

The expected results are as follows:
1. Academic advisors and professors will have a lower level of concussion knowledge than other populations.
2. There will be a positive relationship between level of knowledge and willingness to provide academic accommodations.
3a. Participants in the health and education disciplines will be more willing to provide academic accommodations.
3b. There will be an interaction between academic position and willingness to provide academic accommodations.
The participants themselves will not benefit from the study, however, the results may benefit future professors and academic advisors. Understanding the role of concussion knowledge and willingness to provide accommodations may support development of appropriate educational interventions geared to professors and academic advisors to aid in successful return to learn and thus better outcomes following concussion for collegiate students.

4. Describe Your Subjects

A. Maximum number of participants

500

B. Briefly describe the study population.

A convenience sample of academic advisors and professors from Georgia Southern University including the main campus and 2 satellite campuses. Participants from all disciplines and academic rankings will be recruited for the purpose of this study. Academic disciplines include arts and humanities, behavioral and social sciences, business, education, engineering and computing, health professions, public health, and science and mathematics. Participants' academic position includes lecturer, instructor, assistant professor, associate professor and professors.

C. Applicable inclusion or exclusion requirements (ages, gender requirements, allergies, etc.)

Inclusion Criteria: Employee at the University, full time staff member, minimum of one year at the University, 18 years of age or older.
Exclusion Criteria: Graduate assistants or teachers assistants and temporary or adjunct professors.

D. How long will each subject be involved in the project? (Number of occasions and duration)

Participants will take a 10-minute survey, once, for a total of 10 minutes.

5. Recruitment

Describe how subjects will be recruited. (Attach a copy of recruitment emails, flyers, social media posts, etc.) DO NOT state that subjects will not be recruited.

Participants will be recruited from all three Georgia Southern University campuses. As per University policy, permission from the President's cabinet will be obtained before utilizing University affiliated emails. Once appropriate approvals are obtained, a recruitment email will be sent to all academic advisors and professors, via Qualtrics, with information regarding the study and qualifications for participation. Those interested in participating will be able to complete the survey.

6. Incentives

A. Are you compensating your subjects with money, course credit, extra credit, or other incentives?

☐ Yes ☒ No

B. *If yes, indicate how much and how they will be distributed.*

n/a

C. *Describe if and how you will compensate subjects who withdraw from the project before it ends and any exclusion criteria from compensation.*

n/a

7. Research Procedures and Timeline

A. Outline step-by-step what will happen to participants in this study (including what kind of experimental manipulations you will use, what kinds of questions or recording of behavior you will use, the location of these interactions). Focus on the interactions you will have with the human subjects. Specify tasks given as attachments to this document.

An initial pilot study would be conducted via email. After completion of a review by experts to ensure content validity, a secondary group similar to the participants of interest will complete the survey examining allotted time needed and clarity of the questions. Participants will mimic those who will be selected for the full-scale study; however, they will not be associated with Georgia Southern University. Participants from the pilot study will provide feedback on the survey so potential edits can be made for the full-scale study. After pilot testing has been completed, permission from the president's cabinet to utilize GSU emails will be obtained. Upon obtaining approval from the Institutional Review Board (IRB), we will obtain written approval from the university presidents' cabinet while the survey will be reviewed by the Office of Strategic Research & Analysis (OSRA). A request for permission to use the emails will be completed and submitted to OSRA along with a copy of IRB approval. After required permissions are obtained, an initial email will be sent to the target population using participants' Georgia Southern University affiliated email addresses. The initial email will provide information regarding the study including the purpose and importance of the survey, inclusion and exclusion criteria, as well as a link to the online survey. The survey link will be available to participants for a total of 2 months to allow for the ability to respond at their convenience. A reminder email will be sent at two-week intervals over the course of the 8 weeks encouraging participants to complete the survey. Ideally, a response rate of 30-40% is desired [66].

B. Identify any activity included in the research description that will occur without modification regardless of the research effort. (E.g., A class exercise that is part of the normal course activities that is not altered for the research about which you will collect data or a team warm-up exercise session that is not altered for the study about which you will collect data.)

n/a

C. Describe how legally effective informed consent will be obtained. Attach a copy of the consent form(s).

The first question of the survey will ask the participant to select whether they would like to consent to participate in the study. The question will be set up in a way that the participant must answer the question in order to move forward. If the participant selects no, they will be automatically prompted to the end of the survey. If the participant selects yes, they will be prompted to begin the survey.

D. *If minors are to be used describe procedures used to gain consent of their parent (s), guardian (s), or legal representative (s), and gain assent of the minor.*

☒ N/A or Explain:

E. Describe all study instruments and whether they are validated. Attach copies of questionnaires, surveys, and/or interview questions used, labeled accordingly.

A review of the literature was conducted in previous research to obtain a survey that addressed concussion knowledge and willingness to provide academic accommodations in academic advisors and professors. From this review, no pre-existing survey was found. Therefore, previously validated surveys (Hunt, 2015; Rao, 2003) were adapted for use of this study. The survey consisting of 3 parts for a total of 48 items was developed using Qualtrics Online Survey Software (Qualtrics, Provo, UT). The first section is demographic questions based upon influences presented in previous literature. Secondly, the survey will address concussion knowledge in which participants will be given a list of terms, including distractor terms, in which they must select all the signs and symptoms of a concussion. Next participants will answer a list of true false scenario-based questions regarding concussion recognition, symptomology, and management. Both concussion knowledge sections will be scored together for a total score answered correctly and then data will be compared to previous studies to determine level of concussion knowledge. The last section of the survey will be used to determine faculty willingness to provide academic accommodations. A list of varying academic accommodations will be listed on a Likert type scale ranging from 1 to 5 with 1 being unwilling to provide the accommodations and 5 being willing to provide the accommodation. Each accommodation will be scored individually. In total, the survey will take approximately 10 minutes to complete. After completion of a review by experts to ensure content validity, a secondary group similar to the participants of interest will complete the survey examining allotted time needed and clarity of the questions. Participants will mimic those who will be selected for the full-scale study; however, they will not be associated with Georgia Southern University. Participants from the pilot study will provide feedback on the survey so potential edits can be made for the full-scale study.

F. Describe how you will protect the privacy of study participants.

The participants will not be asked to provide any personal identifying information. Through the survey platform, Qualtrics, security features will be utilized to anonymize the responses by not recording any personal information, IP addresses, and removing contact association.

8. Data Analysis

A. Briefly describe how you will analyze and report the collected data.

Statistical analysis will be completed using IBM SPSS Statistics Software (SPSS, Inc., Chicago, IL). Data will be examined for outliers, skewness, kurtosis, and violations of homogeneity. Descriptive statistics will be run to calculate means and standard deviations of the data. Frequencies will also be run for questions such as years of experience, experience with concussion, and experience with academic accommodations. Additionally, a correlation will be calculated to determine the relationship between participants' concussion knowledge and their willingness to provide academic accommodations. MANOVAs will be run to determine the main effects and interactions between discipline and academic rank in regard to concussion knowledge and willingness to provide academic accommodations. Alpha level will be set *a priori* at 0.05.

B. What will you do with the results of your study (e.g. contributing to generalizable knowledge, publishing sharing at a conference, etc.)?

This study is the first to examine concussion knowledge and willingness to provide academic accommodations from a collegiate faculty and academic advisor perspective. Providing these initial findings to the literature will enable researchers and academicians to develop appropriate interventions to aid in student success following concussion. Ultimately, the results of the study will be used for publication and dissemination at professional conferences.

C. *Include an explanation of how the data will be maintained after the study is complete. Specify where and how it will be stored (room number, password protected file, etc.)*

Data will be kept for the duration of the study and the required duration of three years after data analysis and publication on a password protected computer in a locked office on campus. No identifying information will be utilized therefore files will be anonymous.

D. Student researchers must specify which faculty or staff member will be responsible for records after you have left the university.

Dr. Tamerah Hunt will be responsible for the records at the conclusion of my time at GSU.

E. Anticipated destruction date or method used to render data anonymous for future use.

☒ Destroyed 3 Years after conclusion of research (minimum required for all PIs)

☐ Other timeframe (min 3 years):

☐ Maintained for future use in a de-identified fashion. Method used to render it anonymous for future use:

Note: Your data may be subject to other retention regulations (i.e. American Psychology Association, etc.)

Special Conditions

9. Risk
Even minor discomfort in answering questions on a survey may pose some risk to subjects. Carefully consider how the subjects will react and address ANY potential risks.
A. *Is there greater than minimal risk from physical, mental, or social discomfort?*
☒ No *If no, Do not simply state that no risk exists. If risk is no greater than risk associated with daily life experiences, state risk in these terms.* This study contains no greater risk than associated with daily life activities.
☐ Yes *If yes, describe the risks and the steps taken to minimize them. Justify the risk undertaken by outlining any benefits that might result from the study, both on a participant and societal level.*
B. Will you be carrying out procedures or asking questions that might disturb your subjects emotionally or produce stress or anxiety? If yes, describe your plans for providing appropriate resources for subjects.
This study does not require any survey questions that will disturb patients emotionally.

10. Research Involving Minors
A. Will minors be involved in your research? ☐ Yes ☒ No
B. *If yes, describe how the details of your study will be communicated to parents/guardians. Please provide both parental consent letters and child assent letters (or processes for children too young to read).*
n/a
C. Will the research take part in a school (elementary, middle, or high school)? ☐ Yes ☒ No
D. *If yes, describe how permission will be obtained from school officials/teachers, and indicate whether the study will be a part of the normal curriculum/school process.*
☐ Part of the normal curriculum/school process ☐ Not part of the normal curriculum/school process n/a

11. Deception
A. Will you use deception in your research? ☒ No Deception ☐ Passive Deception ☐ Active Deception
B. If yes, describe the deception and how the subject will be debriefed. Include a copy of any debriefing materials. Make sure the debriefing process is listed in your timeline in the Procedures section.
n/a
C. Address the rationale for using deception.
n/a
Be sure to review the deception disclaimer language required in the informed consent. Note: All research in which active deception will be used is required to be reviewed by the full Institutional Review Board. Passive deception may receive expedited review.

12. Medical Procedures
A. Does your research procedures involve any of the following procedures: ☐ Low expenditures of physical effort unlikely to lead to physical injury ☐ High expenditures of physical effort that could lead to physical injury

☐ Ingesting, injecting, or absorbing any substances into the body or through the skin ☐ Inserting any objects into bodies through orifices or otherwise ☐ Handling of blood or other bodily fluids ☐ Other Medical Procedures ☒ No Medical Procedures Involved
B. *Describe your procedures, including safeguards. If appropriate, briefly describe the necessity for employing a medical procedure in this study. Be sure to review the medical disclaimer language required in the informed consent.*
No medical procedures will be utilized during this study.
C. Describe a medical emergency plan if the research involves any physical risk beyond the most minimal kind. The medical research plan should include, but not necessarily be limited to: emergency equipment appropriate for the risks involved, first rescuer actions to address the most likely physical risk of the protocol, further actions necessary for the likely risks.
This research study does not involve any physical risk beyond those of daily life.

Reminder: No research can be undertaken until your proposal has been approved by the IRB.

APPENDIX C

SURVEY INSTRUMENT

Demographics:

By clicking yes and completing survey, you are agreeing to participate within the study.

- Yes, I consent to participate in the study
- No, I do not wish to participate in the study

Race:

- White or Caucasian
- Black or African American
- Hispanic or Latino
- Asian
- Other
- Prefer not to answer

Gender:

- Male
- Female

Job Title:

- Professor
- Academic Advisor

If you selected Academic Advisor, please specify in which department:

- General student population
- Athletics

If you selected Professor, please specific which college/discipline:

- Arts and humanities
- Behavioral and social sciences
- Business
- Education
- Engineering and computing
- Health professions
- Public health
- Science and mathematics

Total years of experience:

- 1-4
- 5-9
- 10-14
- 15-19
- 20+

Years at Georgia Southern University (GS):

- 1-2
- 3-4
- 5-6
- 6-8
- 9-10
- 11+

If professor was selected, what is your academic ranking?

- Instructor
- Clinical Instructor
- Assistant professor
- Associate professor
- Professor

What Georgia Southern University campus are you affiliated with?

- Statesboro
- Hinesville
- Armstrong

What is your typical classroom structure?

- Online classes
- Face to face classes
- Both
- Not applicable

Are you aware of the Student Accessibility Resource Center (SARC) here at GSU?

- Yes
- No

Have you received education or training on what the Student Accessibility Resource Center (SARC) is? If yes, explain the type of education or training.

- Yes
- No

Please explain the type of education or training you have received regarding the SARC? Or how you heard about this resource.

Have you had experience with students requesting academic accommodations for learning disabilities?

- Yes
- No

Are you aware of the concussion policies regarding classroom management implemented for student athletes at GS?

- Yes
- No

Do you believe students performing academic responsibilities can exacerbate their concussion symptoms?

- Yes
- No

Do you believe students recovering from a concussion need academic accommodations?

- Yes
- No

Do you, as a professor or academic advisor, feel that you play a role in the academic gradual return to the classroom and providing academic accommodations for students recovering from a concussion?

- Yes
- No

Are you willing to provide established academic accommodations to those recovering from a concussion?

- Yes
- No

Have you had experience providing established academic accommodations to students with concussion? For example, accommodations coming from the disabilities resource center.

- Yes
- No

If yes is selected, how many students with concussions have you provided established accommodations? For example, accommodations coming from the disabilities resource center.

Do you feel comfortable providing recommendations for academic accommodations to those recovering from a concussion?

- Yes
- No

Have you had experience providing recommendations for academic accommodations to students with concussion? For example, you and the student came up with an agreement on accommodations utilized.

- Yes
- No

If yes is selected, how many students have you provided academic accommodations for? For example, you and the student came up with an agreement on accommodations utilized.

Have you ever received education/training regarding concussions or concussion management in the classroom? If yes, please education/training.

- Yes
- No

Please explain what kind of education/training you received on concussion or concussion management.

Concussion Knowledge Piece: adapted from Hunt Concussion Education Survey

Please check all signs and symptoms you think are related to a student having a concussion.

____ Loss of consciousness
____ Neck pain
____ Hunger
____ Balance problems
____ Nausea/vomiting
____ Headache
____ Difficulty concentrating
____ Confusion
____ Endurance
____ Blurry vision
____ Disorientation
____ Burst of energy
____ Memory loss
____ Difficulty remembering
____ Dizziness
____ Sleepiness
____ Sensitivity to light
____ Thirst
____ Fatigue
____ Mood Changes

A concussion only occurs if person sustains a loss of consciousness (blacks out). T/F

A concussion requires immediate removal from participation of activity. T/F

An athlete who reports having a headache after a concussion will likely demonstrate signs and symptoms associated with concussion. T/F

An athlete who displays any sign or symptom of concussion should not be allowed to return to activity. T/F

Is it okay for an athlete to continue playing in a game in which he/she has suffered a concussion? T/F

A person who has recovered from a concussion is less able to withstand a second blow to the head. T/F

It is easy to tell if a person has brain damage from a concussion by the way a person looks or acts. T/F

A concussion is harmless and never results in long term deficits or brain damage. T/F

Sometimes a second blow to the head can help a person remember things that were forgotten. T/F

People who have had one concussion are more likely to have another. T/F

A concussion can cause brain damage even if the person does not lose consciousness. T/F

Willingness to provide individual academic accommodations

If your student presented with a physician diagnosed concussion, using a 1 to 5 Likert type scale with 1 being unwilling to 5 being willing, how likely are you to provide the following accommodations to students?

Ability to tape record classroom lectures	1 2 3 4 5
Printed copies of lectures	1 2 3 4 5
Extend deadlines for assignments, papers, projects	1 2 3 4 5
Allow students to complete alternative assignments	1 2 3 4 5
Allow student to take alternative form of an exam	1 2 3 4 5
Allow student extra time to complete an exam	1 2 3 4 5
Allow student to postpone test date until concussion recovery	1 2 3 4 5
Excuse absence from class for rest during initial phase of concussion recovery	1 2 3 4 5
Allow students to wear sunglasses in the classroom	1 2 3 4 5
Alternative testing location	1 2 3 4 5
Allow the use of a student note-taker	1 2 3 4 5
Provide alternative forms of classroom materials (notes, lectures, etc)	1 2 3 4 5