

SURVEY OF STUDENT DISABILITIES SERVICES' CURRENT
PERCEPTIONS ON CONCUSSIONS AND/OR MILD TRAUMATIC BRAIN
INJURIES AND CURRENT DISABILITY ACCESS ACCOMMODATIONS
AVAILABLE TO RECOVERING COLLEGIATE ATHLETES

A THESIS

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by

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INTRODUCTION

The purpose of this study was to examine the current perceptions, protocols and disability access accommodations most commonly requested and approved by a university's office of student disability services (OSD) for post-secondary student-athletes recovering from concussions and/or mild traumatic brain injuries (MTBI). Concussion is defined as a traumatically induced transient disturbance of brain function and is caused by a complex pathophysiologic process.¹ Concussions have also been referred to as mild traumatic brain injuries (MTBI).¹ While all concussions are MTBIs, not all MTBIs are concussions.¹ Concussions are a subset of mild traumatic brain injury on the less severe end of the brain injury spectrum and are generally self-limited in duration and resolution.¹ It is important to examine this problem because the effects of a concussion and or mild traumatic brain injury may impair an athlete not only from an athletic standpoint but additionally can interfere with academic success and activities of daily living.^{2-4,6,8-9,8-10} Collaboration between the sports medicine staff and OSD will provide a holistic approach to the

education, evaluation, treatment, and recovery from concussions and MTBI.

Several key guidelines and return to play protocols have been established by the 1st, 2nd, and 3rd International Conferences on Concussions and the National Athletic Trainers' Association Position Statement: Management of Sport-Related Concussion.²⁻⁴ However, an athletic trainer (AT) can't assume that these advances in concussion and MTBI protocol are common knowledge among every professional employed at a university. Having found little literature and evidence on the current perceptions of OSD professionals and the most commonly requested and approved disability access accommodations provided for recovering post-secondary student-athletes, there is a need for future research.

Since sport medicine staffs and academic affairs have a vested interest in a university's student-athletes, it is imperative that everyone involved is familiar with the current concussion and/or MTBI protocols both from a return to play standpoint as well as an academic one. By evaluating the current perceptions and familiarity of a university's office of student disabilities with concussions and/or MTBI, an AT could provide critical information that would aid in a student-athlete's recovery

and success both on and off the field.¹¹⁻¹⁴ The AT could aid in the manner that professionals working in the OSD are educated in concussions and/or MTBI and their impairments on cognitive functioning. Through this collaborating, the AT would also learn what accommodations are available and recommended/approved by the OSD for these recovering student-athletes.

The goal of increasing rapport and communication between these two sectors would allow for optimal care of an injured student-athlete, along with enhancing the knowledge base of both sectors.¹¹ Athletic trainers (ATS) could identify trends and areas that require further education with the potential of creating a liaison position between the two sectors.

The purpose of this study and survey was to identify the current perceptions in the realm of concussions and MTBI among professionals working in OSD. Identification of areas for advancing education, gaining a better understanding of disability access accommodations most commonly requested and approved to the recovering student-athletes, and the creation of a synergistic collaboration between the OSD and an AT staff are hopeful potential outcomes of this study. Establishing an initial framework for future research and communication between the two

sectors will enhance a university's ability to holistically meet the needs and challenges facing today's post-secondary student-athlete.

METHODS

The purpose of this study was to assess the current perceptions and familiarity of student disability services professionals in regards to concussions and/or MTBI and to identify the most commonly requested and approved disability academic access accommodations available to post-secondary student-athletes. A survey was distributed electronically among professionals working in the office of student disabilities/student disability services at collegiate institutions in the Mideast and Great Lake regions. The Mideast and Great Lake regions were selected using the National Center for Educational Statistics CollegeNavigator Tool (<http://nces.ed.gov/collegenavigator/>). CollegeNavigator is a free tool for use in the public sector. The Mideast region and Great Lakes region are comprised of the following states: IL, IN, NY, NJ, PA, DC, DE, MD, MI, OH and WI. The survey evaluated what academic disability access accommodations are most commonly requested for and approved for the recovering student athlete. Additionally, the survey examined how the student disability service professionals equated the two terms "concussion" and "mild traumatic brain injury" when used to describe an injury,

the average number of concussions and/or MTBI seen each year by the OSD from student-athletes, and the average number of visits these student-athletes utilized to the OSD during their recovery. This section will include the following subsections: Research Design, Subjects, Instruments, Procedures, Hypotheses, and Data Analysis.

Research Design

A descriptive study was utilized in the research design with the Jakiel OSD Perceptions Concussions and/or MTBI Survey distributed among 399 four-year universities with men and women's varsity athletics to current OSD professionals working at their respective institution's post-secondary OSD. The Jakiel OSD Perceptions Concussions and/or MTBI Survey was generated through SurveyMonkey® and distributed via email by the primary researcher. Variables of the Jakiel OSD Perceptions Concussions and/or MTBI Survey can be seen below (Table 1).

Table 1. Jakiel OSD Perceptions Concussions and/or MTBI Survey Variables

Variables
Basic demographic information
Athletic governing body
Disability access accommodations most commonly requested and approved
Number of concussions and/or MTBI by student-athletes seen each year by OSD
What the OSD professional equated the severity of the terms "concussions" and "MTBI"
If the OSD professional was familiar with current Zurich concussion and/or MTBI protocols
Average number of visits a student-athlete recovering from a concussion and/or MTBI utilized the OSD
Number and employment status of all staff in OSD
If the OSD professional feels enough has been done to educate on concussion and/or MTBI
If the OSD professional had direct contact with their university's athletic training staff
Had the OSD professional worked with an AT or sports medicine staff member to develop concussion and/or MTBI management and protocol for student-athletes
How often did the OSD professional have contact with their university's AT staff or sports medicine staff regarding student-athletes who had been diagnosed with concussions and/or MTBI
How comfortable was the OSD professional in managing and directing a student-athlete suffering a sports related concussion and/or MTBI from an OSD standpoint
If there was a liaison between the OSD and the athletic training staff

Subjects

The subjects used in this study included 133 male and female full-time OSD employees from Division I, II, III, NAIA, and other athletic governing body affiliation collegiate institutions within the Mideast and Great Lake

regions as defined by the Center for Educational Statistics CollegeNavigator Tool. The Jakiel OSD Perceptions Concussions and/or MTBI Survey was distributed electronically to the OSD professionals currently employed in the above mentioned athletic governing body affiliations. The entire sample received an email with a link and instructions on completing the survey. The first page of the survey contained a cover letter informing the participants (Appendix C3) of their role in the study and their ability to end participation at any time. The subjects completed the survey electronically via the Internet on SurveyMonkey®, and implied informed consent was given upon completion and submission of the survey to the researcher. The study was approved by the Institutional Review Board (Appendix C2) at California University of PA. Participation in the study was voluntary based upon completion of the survey and subjects could choose to terminate their participation in the study at any time. Each participant's identity remained confidential and was not included in the study. The survey remained on a secure password protected website (www.surveymonkey.com) and only the researcher and research advisor have access to the surveys.

Preliminary Research

A panel of experts reviewed the survey before any research was conducted. The panel members, whom are faculty members at California University of Pennsylvania (*CAL U*), added to the content validity of the survey and made suggestions for any necessary changes. The panel consisted of certified athletic trainers and the director of the OSD at *CAL U* with experience and knowledge of concussions and/or MTBI and survey construction. The panel members were sent a cover letter (Appendix C1) explaining the design and the experts' responsibilities in this study as well as the researcher's problem statement and a copy of the Jakiel OSD Perceptions Concussion and/or MTBI Survey (Appendix C). The panel members reviewed the survey instrument and added to the content validity by making any recommendations for improvement. After reviewing the survey, the panel members provided critiques and changes that were reviewed for revision. Necessary changes were made to the survey based on critiques by panel of experts.

After the review by the experts, a preliminary research study was administered to OSD professionals working in the Pennsylvania State Athletic Conference to test the effectiveness of the survey. The surveys were

sent out electronically via email to the directors of each institution's OSD. The purpose of the preliminary study was to establish reliability and validity of the survey. However, an inadequate number of responses were gathered from the preliminary study despite the efforts of the researcher. Reminder emails and phone calls to the OSD for each school were utilized to try to generate the necessary responses, but failed to do so. Reliability and validity were unable to be established. The time it took to complete the survey was established at approximately five minutes.

Instruments

The Jakiel OSD Perceptions Concussion and/or MTBI Survey (Appendix C1) was created by the researcher for the purpose of evaluating the current perceptions professionals in the OSD have on concussions and/or MTBI, along with evaluating the most commonly requested and approved disability access accommodations that are available to the recovering student-athlete. The survey was created electronically via www.SurveyMonkey.com. The subjects were asked to complete demographic information including age, gender, size and employment status of the staff working in their respective OSD, if the OSD professional was employed

at the NCAA, NAIA, or other athletic governing body affiliation. Subjects were also asked if they had participated in a concussion and/or MTBI education training sessions and their personal history of concussions and/or MTBI. Additional questions were asked about how the subject equates the terms "concussion" and "MTBI", and if they were familiar with the current universal concussion and/or MTBI management protocol established by the Zurich conference. Questions regarding if the subjects had worked with ATs to develop concussion and/or MTBI management and protocols for student-athletes, how often the subjects had contact with their university's AT staff regarding student-athletes who had been diagnosed with concussions and/or MTBI, and how comfortable the subjects were in managing and directing student-athletes suffering from a sports related concussion and/or MTBI from an OSD standpoint were also examined. The survey took approximately five minutes for participants to complete.

Procedures

The study was granted approval by the California University of Pennsylvania Institutional Review Board (IRB). Following approval, an email containing a link to

the Jakiel OSD Perceptions Concussions and/or MTBI Survey was sent to all OSD professionals with a current email account in the Mideast and Great Lake region. The first page of the survey contained a cover letter (Appendix C3) explaining the purpose and significance of the study. A link in the email provided the OSD professionals with direct access to begin the survey. Informed consent was implied when the subjects clicked on the link at the bottom of the email. An additional email was sent out one week after the initial email as a reminder to complete the survey. There was no obligation of the subjects to participate. All subjects who completed the survey remained anonymous with no way to trace answers back to one subject. The risk was minimal in this study. The possible risk of harm associated with this knowledge research was psychological and dignitary in nature. Since the responses of each individual are confidential, the risk posed was small. Gathered data were analyzed and tested against the hypotheses developed by the researcher.

Hypotheses

The following hypotheses were based on previous research and the researcher's intuition based on a review of the literature.

1. Division I OSD professionals will have worked more frequently with an athletic trainer or sports medicine staff member to develop a concussion and/or mild traumatic brain injury management protocol for student-athletes when compared to OSD professionals from NCAA Division II, III, NAIA, or other athletic governing body affiliation.
2. Division I OSD professionals will be more comfortable in managing and directing a student-athlete suffering a sports related concussion and/or mild traumatic brain injury from an OSD standpoint than OSD professionals from NCAA Division II, III, NAIA, or other athletic governing body affiliation.

Data Analysis

All data were analyzed utilizing SPSS Version 18.0 for Windows at an alpha level of 0.05 ($\alpha \leq 0.05$). A Pearson Chi Square test was used to analyze Hypothesis 1 to determine if NCAA Division I OSD professionals have worked more frequently with AT staff in the development of concussion and/or MTBI management protocol when compared to their Division II, III, NAIA, or other athletic governing body affiliation counterparts. A Pearson Chi Square test was used to analyze Hypothesis 2. This test was utilized to determine if NCAA Division I OSD professionals are more comfortable managing and directing a student-athlete suffering from a concussion and/or MTBI from an OSD standpoint than OSD professionals from Division II, III, NAIA, or other athletic governing body affiliation.

RESULTS

The purpose of this study was to examine the current perceptions of professionals working in the OSD in regards to concussions and/or MTBI, and the most commonly requested and approved disability access accommodations provided by a university's OSD for student-athletes recovering from a mild traumatic brain injury. The following section contains the data collected in the study and is divided into three subsections: Preliminary Results, Demographic Information, Hypothesis Testing and Additional Findings.

Preliminary Results

The preliminary study was conducted in the Pennsylvania State Athletic Conference (PSAC). The Jakiel OSD Perceptions Concussions and/or MTBI Survey was emailed to 15 universities in the PSAC. California University of Pennsylvania was not used in the study because the director of the OSD was used during the creation of the survey and served on the panel of experts. A reminder email was sent out a week later asking for the OSD professional to retake the survey to establish validity and reliability.

There were no issues reported navigating the Jakiel OSD Perceptions Concussions and/or MTBI Survey during the preliminary study. The time of completion was also established during the preliminary study. Eighty-eight point nine percent (88.9%) of participants stated the survey took approximately 5 minutes. A total of 10 responses were collected with 9 completed surveys. After contacting the OSD for each institution by phone and email to request participation, an adequate amount of responses was not collected for the second round of surveying. Reliability and validity were not able to be established.

Demographic Information

The Jakiel OSD Perceptions Concussions and/or MTBI Survey was sent out to 399 OSD contacts from the Mideast and Great Lake Regions. The Mideast and Great Lake Regions are comprised of the following states: IL, IN, NY, NJ, PA, DC, DE, MD, MI, OH and WI as classified by the CollegeNavigator Tool from the National Center for Educational Statistics. A total of 133 surveys were returned (33.33%) with 118 fully completed (29.57%). There are currently approximately 1,300-1,500 NCAA and NAIA member institutions in the United States. The sample size

surveyed made up approximately 26.60%-30.68% of all NCAA and NAIA member institutions. Eight point eighty-six percent (8.86%) to ten point twenty-three percent (10.23%) of all NCAA and NAIA member institutions responded with seven point eighty-seven percent (7.87%) to nine point eight percent (9.08%) fully completed the Jakiel OSD Perceptions Concussions and/or MTBI Survey. The sample consisted of OSD professionals from the following collegiate affiliations: NCAA Division I (28), NCAA Division II (23), NCAA Division III (57), NAIA (6), and other athletic governing body affiliation (11). A frequency table of demographics is shown in Table 2.

Table 2. Frequency Table of Demographic

Athletic Governing Body	Number of Respondents	Percent
I	28	22.4
II	23	18.4
III	57	45.6
NAIA	6	4.8
Other	11	8.8
Total	125	100.0

All participants were 18 years of age or older. Out of the 133 surveys collected, 125 reported their gender, 8 chose to omit to answer. Table 3 represents the gender of the participants.

Table 3. Frequency Table of Participant Gender

Gender	Frequency	Percent
Male	20	16
Female	105	84

Information was gathered regarding the size of each respondent's staff in the OSD and the employment status of the staff. A frequency table of the size of the OSD staff and their employment statuses are represented by Table 4 and Table 5.

Table 4. Frequency Table of Staff Size

Staff Size	Number of Respondents	Percent
1	44	35.2
2-3	48	38.4
4-5	17	13.6
5+	16	12.8
Total	125	100

Table 5. Frequency Table of Employment Status

Employment Status	Number of Responses	Percent
Full-time Staff	113	90.4
Part-time Staff	64	51.2
Full-time Faculty	21	16.8
Part-time Faculty	15	12.0

Hypothesis Testing

The following hypotheses were tested in this study. All hypotheses were tested with a level of significance set at $\alpha \leq 0.05$.

Hypothesis 1: Division I OSD professionals will have worked more frequently with an athletic trainer or sports medicine staff member to develop a concussion and/or mild traumatic brain injury (MTBI) management protocol for student-athletes when compared to OSD professionals from NCAA Division II, III, NAIA, or other athletic governing body affiliation.

Conclusion: A Pearson's Chi-Square test of independence was performed to examine the potential relationship between the athletic governing body collegiate setting of the OSD professional and how often that professional had contact with his/her university's athletic training staff or sports medicine staff regarding student-athletes who have been diagnosed with concussions and/or mild traumatic brain injuries. The relation between these variables was statistically significant, ($\chi^2(16)=27.403$, $p=.037$). Office of student disabilities professionals at the NCAA Division I level were more likely to frequently contact their athletic training staff than OSD

professionals at the Division II, Division III, NAIA, or other athletic governing body affiliation.

Hypothesis 2: Division I OSD professionals will be more comfortable in managing and directing a student-athlete suffering a sports related concussion and/MTBI from an OSD standpoint than OSD professionals from NCAA Division II, III, NAIA, or other athletic governing body affiliation.

Conclusion: A Pearson's Chi-Square test of independence was performed to examine the potential relationship between the athletic governing body collegiate setting of the OSD professional and how comfortable the OSD professional was in managing and directing a student-athlete suffering from a sports related concussion and/or mild traumatic brain injury from an OSD standpoint. The relationship between these variables was not statistically significant, ($\chi^2(16)=8.001$, $p=.949$). Collegiate setting and comfort level appear to be independent events (Table 6).

Table 6. Contact and Comfort Means

Athletic Governing Body	Contact with AT (Mean, SD)	Comfort (Mean, SD)
I	4.39 (1.227)	3.64 (1.062)
II	4.43 (1.502)	3.61 (0.988)
III	4.73 (1.380)	3.47 (1.034)
NAIA	5.50 (.837)	3.33 (1.366)
Other	Constant (omitted)	3.22 (1.202)

Contact with AT: 1= Daily, 2= Once a week, 3= Once a month, 4= Once a semester, 5= Once a year, 6= Never

Comfort: 1= Very Uncomfortable 2= Uncomfortable, 3= Neither Comfortable or Uncomfortable, 4= Comfortable, 5= Very Comfortable

Additional Findings

Additional findings of the study showed what disability access accommodations are most commonly requested and approved. Office of student disability professionals were asked to select all the accommodations that they normally requested approval for a student-athlete recovering from a sports related concussion/and or MTBI (Table 7).

Table 7. Disability Access
Accommodations Most Commonly
Requested and Approved

Accommodation	Percent of OSD Requested/Approved
Extra Testing Time	(95.0%)
Quiet Testing Environments	(86.6%)
Extended Deadlines	(52.1%)
Recorded Lectures	(44.5%)
Other	(28.6%)
Power Point lectures	(26.9%)
No Initial Cognitive Activity	(14.3%)

In the other category, note takers were mentioned by 20 of the OSD professionals surveyed. If the study were to be conducted again, the primary researcher would add note takers as a potential choice due to its prevalence in this study.

Additional findings of the studied examined the OSD professional's familiarity with concussions/and or MTBI, if they themselves had previously sustained a concussion/and or MTBI, if they were familiar with the current Zurich guidelines and protocols for the management of concussion/and or MTBI, and if they had collaborated in the past with their university's athletic training staff in regards to their institution's concussion/and or MTBI management

protocol. Table 8 represents the frequency of OSD professionals' responses.

Table 8. Frequency Table of Familiarity, Previous Medical History, Familiar with Zurich Guidelines, & ATS Collaboration for Protocols with Concussions/MTBI

Question	Yes	No
Familiarity	199 (97.5%)	3 (2.5%)
Previous Medical History of a Concussion/MTBI	26 (21.3%)	96 (78.7%)
Familiar with Zurich	41 (33.6%)	81 (66.4%)
ATS Collaboration for Protocols	44 (36.1%)	78 (63.9%)

Comparison of the two terms "Concussion" and "MTBI" were utilized in the study to see if there was a difference in how the OSD professional equated the severity of the injury when to the two terms were used to describe an injury. Table 9 represents the frequency of the responses based upon the current perceptions OSD professionals had when presented with the two terms qualifying a sports-related head injury. The majority (74.4%) of the OSD professionals perceived concussions as a "moderate" injury. Similarly, the majority (67.2%) of the OSD professionals surveyed perceived MTBI as a "moderate" injury.

Table 9. Frequency Table of Terms
Concussion Vs. MTBI

Perception of Severity	Concussion	MTBI
Mild	37	39
Injury	(30.6%)	(32.8%)
Moderate	90	80
Injury	(74.4%)	(67.2%)
Severe	67	34
Injury	(55.4%)	(28.6%)
Getting	6	7
Dinged	(5%)	(5.9%)
Getting	11	9
your Bell	(9.1%)	(7.6%)
Rung		
No Opinion	10	12
	(8.3%)	(10.1%)

The average number of concussion/and or MTBI cases seen each year by the OSD was recorded (Table 10) along with the average number of visits student-athletes recovering from a sports related head injury utilized their OSD (Table 11). From the collected data 66.1% of surveyed OSD professionals reported an average of 1-5 concussion/MTBI cases seen each year by their respective OSD. Of the reported cases, 53.7% of OSD professionals reported that student-athletes recovering from a sports-related head injury utilized the OSD on an average of 1-4 visits.

Table 10. Frequency Table of Yearly Average of Concussion/MTBI cases

Number of Cases	Responses	Percent
0	11	9.1
1-5	80	66.1
6-10	17	14.0
11-15	6	5.0
15+	7	5.8

Table 11. Frequency Table of Average Visits to OSD.

Visits	Responses	Percent
0	33	27.3
1-4	65	53.7
5-9	16	13.2
10+	7	5.8

Identification of a liaison between the OSD and the athletic training staffs at a university was also measured (Table 12). Of the 121 collected responses, only 43 (35.5%) reported that there was a liaison between the OSD and athletic training staff. Current perceptions if enough was being done in regards to educating individuals on the disability and impairment of concussions/and or MTBI was measured (Table 13). Out of the 119 responses collected only 25 (21%) reported that they felt enough was being done in regards to education on concussions/MTBI.

Table 12. Frequency Table of Liaison Between OSD and ATS

Liaison	Responses	Percent
Yes	43	35.5
No	78	64.5

Table 13. Frequency Table of Perception if Enough is Being Done in Regards to Education on Concussions/MTBI?

Is enough being done?	Responses	Percent
Yes	25	21.0
No	94	79.0

The perceptions of OSD professionals in regards to a need for enhanced and increased communication between the OSD and the athletic training departments were measured (Table 14). Seventy (59.3%) of respondents reported the need for an increase in communication between the two departments.

Table 14. Frequency Table on Need for Enhanced Communication Between OSD and Athletic Training Department

Yes	No
70 (59.3%)	48 (40.7%)

Previous attendance and interest in attending future educational lectures on Concussions/MTBI was recorded

(Table 15). Only 19 (16.0%) of respondents reported that they had previously attended an educational lecture on concussions/MTBI. However 99 (83.2%) of OSD professionals surveyed reported that they had an interest in attending these educational lectures.

Table 15. Frequency Table of Attendance and Interest in Attending Educational Lectures on Concussions/MTBI

Question	Yes	No
Have you Attended?	19 (16.0%)	100 (84.0%)
Are you interested in attending?	99 (83.2%)	20 (16.8%)

The influence of financial cost on the likelihood of an OSD professional's attendance to educational lectures on concussions/MTBI was measured and collected (Table 16). This was an interesting finding considering 66.7% of OSD professionals who reported they had interest in attending educational lectures reported that they attendance would be influenced by financial cost.

Table 16. Frequency Table of Influence of Financial Cost on Attendance to Educational Lectures

Question	Yes	No
Would your attendance change if you had to pay?	66 (66.7%)	33 (33.3%)

The extent and willingness of an OSD professional to attend an educational lecture on concussions/MTBI based upon financial cost was recorded (Table 17). Over half (56.9%) of OSD professionals surveyed reported that they were most likely to attend an educational lecture if the financial cost was between \$0-\$25.

Table 17. Frequency Table of Cost and Willingness to Attend Educational Lectures

Total Cost	Would Attend
\$0-\$25	37 (56.9%)
\$26-\$50	12 (18.5%)
\$51-\$75	7 (10.8%)
\$76-\$100	7 (10.8%)
\$100+	2 (3.1%)

DISCUSSION

The focus of this study was to determine if the athletic governing body collegiate affiliation that the OSD professional was employed in influenced their perceptions on concussions and/or MTBI. Differences in interactions with their university's athletic training staff or sports medicine staff in regards to student-athletes that had sustained a mild traumatic brain injury and/or concussion from a sports related standpoint was also evaluated. The study also examined if the athletic governing body collegiate affiliation that the OSD professional was employed at influenced the OSD professional's comfort level in properly managing and directing a student-athlete suffering a sports related concussion and/or mild traumatic brain injury from an OSD standpoint. It's important to note that reliability and validity of the Jakiel OSD Perceptions Concussions and/or MTBI Survey was not established during the preliminary study that was conducted in the Pennsylvania State Athletic Conference (PSAC).

The following section is divided into four subsections: Discussion of Results, Recommendations for

Future Research, Implications to the Profession, and Conclusions.

Discussion of Results

This study examined whether the athletic governing body affiliation the OSD professional was employed in influenced their interactions with their university's athletic training staff or sports medicine staff in regards to student-athletes that had sustained a mild traumatic brain injury and/or concussion from a sports related standpoint. The study also examined if the athletic governing body affiliation the OSD professional was employed at influenced the OSD professional's comfort level in properly managing and directing a student-athlete suffering a sports related concussion and/or mild traumatic brain injury from an OSD standpoint.

Hypothesis 1 stated NCAA Division I OSD professionals will have worked more frequently with an athletic trainer or sports medicine staff member to develop a concussion and/or mild traumatic brain injury (MTBI) management protocol for student-athletes when compared to OSD professionals from NCAA Division II, NCAA Division III, NAIA, or other athletic governing body affiliations. There

was no previous research published or identified on the influence of the athletic governing body affiliation of an OSD professional on the frequency in which they had contact with their university's athletic training staff or athletic training department. Based on the researcher's intuition, it was thought that OSD professionals working at the NCAA Division I level would have more frequent contact as opposed to OSD professionals working at NCAA Division II, NCAA Division III, NAIA, or other athletic governing body affiliation. This assumption was made because the researcher believed that NCAA Division I OSD professionals who have larger staffs and more resources to their disposal when compared to OSD professionals at the NCAA Division II, NCAA Division III, NAIA, or other athletic governing body affiliation. With the potential for larger staffs due to increased budgets the researcher believed that the cases seen by OSD professionals would be more evenly distributed among the employed staff and allows a greater amount of attention to be dedicated to each individual case. This assumption is based upon the researcher's previous experience at the Junior College level where only one OSD professional was employed to handle the needs of the institution. The relation between these variables was statistically significant and supported this hypothesis.

Responses from the survey showed that Division I OSD professionals were the most likely to maintain frequent contact when compared to OSD professionals at the other NCAA Division or colligate affiliation.

Hypothesis 2 stated that Division I OSD professionals would be more comfortable in managing and directing a student-athlete suffering a sports related concussion and/MTBI from an OSD standpoint than OSD professionals from NCAA Division II, III, NAIA, or other affiliation. The researcher hypothesized that Division I OSD professional would be more comfortable due to their increased resources when compared to the lower NCAA divisions and other athletic governing body affiliations. The relationship between these variables was not statistically significant and did not support the original hypothesis. OSD professionals from each NCAA division and collegiate affiliation reported similar levels of comfort when managing and directing a student-athlete suffering a sports related concussion and/MTBI from an OSD standpoint.

Office of student disabilities professionals expressed an interest in increasing their current knowledge base in regards to concussions/and or MTBI. A way to potential meet this demand would be to utilize social media sites, such as Facebook to hold open discussions and forms. Ahmed et al¹⁵

studied postings on Facebook groups related to concussions. Individuals utilized the Facebook groups to relate personal experiences of concussions, seek advice, or offer advice in regards to concussions.¹⁵ Office of student disabilities professionals and ATs could utilize a similar format to provide educational opportunities and create effective communication between both departments when questions arise about the management of post-secondary student-athletes recovering from a sports related concussion.

The findings of the perception of severity of the terms concussion vs. mild traumatic brain injury do not reflect previously conducted research. Research conducted by Weber and Edwards¹⁶ determined the influence of the terms concussion, MTBI, and minor head injury.¹⁶ Subjects utilized in the study conducted at the University of Birmingham found that terminology significantly influenced both the expected injury outcome and familiarity. Outcome expectations were reliably more negative for the term MTBI than concussion or minor head injury.¹⁶ Responses from the Jakiel OSD Perceptions Concussions and/or MTBI Survey showed that OSD professionals rated the term concussion a severe injury (55.4%) compared to MTBI (28.6%).

The recommended disability access accommodation for recovering post-secondary student-athletes supports

previous findings and literature. The need for potential academic alterations or accommodations for the symptomatic athlete are strongly supported by the guidelines set forth by Kirkwood et al¹⁷ when reintroducing the student athlete back into the school environment.¹⁷ Protecting the rights of the student-athletes must also be taken into consideration considering that the inclusion of a 504 plan is not an option at the collegiate level. Section 504 protects individuals with disabilities from discrimination and ensures that children with disabilities have equal access to an education.¹⁷ Typically students who need only an accommodation-but not specialized direct instruction-are provided those accommodations under a 504 plan.¹⁷

Recommendations for Future Research

The purpose of this study was to assess the current perceptions and familiarity of student disability services professionals in regards to concussions and/or MTBI and to identify the most commonly requested and approved disability academic access accommodations available to post-secondary student-athletes. The study also examined if collegiate setting and athletic governing body affiliation impacted the OSD professional's comfort level in managing

care and academic accommodations for a recovering student-athlete and if the frequency that the OSD professional communicated with their athletic training staff was also influenced.

After reviewing the results and finding of the study, one recommendation would be to increase the overall response rate. Utilizing the CollegeNavigator tool, the regions that were not selected for this study could be included to identify any differences in responses based on region. Another method to obtain a larger sample size could be accomplished through gaining approval for distribution of a survey through an organization such as the Association on Higher Education and Disability (AHEAD). Distribution to OSD professionals that hold membership in AHEAD could examine responses from a global perspective to identify if there are significant differences between countries and cultures in the manner that concussions and/or mild traumatic brain injuries are managed.

The inclusion of an incentive or reward for participation in the survey could also increase the overall response and completion rate. Utilizing OSD professionals who work with non-student-athletes along with the OSD professionals surveyed in this study could also increase overall response rates.

The survey identified that 59.3% of the OSD professionals felt there was a need to enhance communication between the office of student disabilities and athletic training departments. The creation of a liaison position or holding regular staff meetings with professionals from both departments could address this need. How often these meetings should occur could be determined by surveying professionals in both departments.

Implications to the Profession

One of the biggest implications to both the athletic training and office of student disability professions is the need for increased communication between the two sectors. Although NCAA Division I OSD professionals communicated on a more frequent basis than their counterparts, communication from NCAA Division I OSD professionals was roughly a little less than once a semester (Table 5). In order to provide a more holistic approach to care for collegiate student-athletes, a greater emphasis should be placed on increasing the frequency of communication.

The comfort level reported by the OSD professionals surveyed in this study showed that a potential increase in

education and educational opportunities could aid in meeting the needs of collegiate student-athletes recovering from a concussion and/or MTBI. NCAA Division I professionals reported a comfort level of 3.64, NCAA Division II professionals reported at 3.61, NCAA Division III professionals reported at 3.47, NAIA professionals reported at 3.33, and professionals from other athletic governing bodies reported at 3.22.

With amendments to current concussion/MTBI return to play protocol, keeping OSD professionals updated with current literature and practices could aid in increasing their overall comfort levels in handling recovering post-secondary student-athletes from an OSD standpoint. The creation of educational opportunities to further advance awareness and knowledge of concussion and/or MTBI management could contribute to a holistic approach towards meeting the needs of recovering student-athletes.

Conclusions

Based on the results of this study, we can conclude that there is a need to increase communication between the office of student disabilities and athletic trainers in regards to provide care from a holistic standpoint for

recovering student-athletes that have sustained a concussion/and or MTBI. Regarding the potential relationship between the athletic governing body collegiate setting of the OSD professional and how often that professional had contact with their university's athletic training staff or sports medicine staff regarding student-athletes who have been diagnosed with concussions and/or mild traumatic brain injuries. The relation between these variables was statistically significant (Table 6). Fifty-Nine point three percent (59.3%) of OSD professionals surveyed agreed that there is a need to enhance communication between both the OSD and athletic training sectors of a university.

When considering relationship between the athletic governing body collegiate setting of the OSD professional and how comfortable the OSD professional was in managing and directing a student-athlete suffering from a sports related concussion and/or mild traumatic brain injury from an OSD standpoint. The relationship between these variables was not statistically significant. Exploring why this was the case by asking the level of experience or number of years working as an OSD professional at the post-secondary setting could be explored in a future study to determine why comfort levels of OSD professionals were not

significant based upon employment setting. Identifying if the university where the OSD professional is employed at has an athletic training education program could also be evaluated to see if the presence of certified athletic trainers influenced the comfort level of the OSD professional when handling sport-related concussion/ and or MTBI cases.

There also appears to be a need for increasing the educational opportunities for OSD professionals as 83.2% of the respondents reported that they had an interest in attending educational seminars on concussions and/or MTBI. However it should also be noted that 66.7% of the respondents reported that attendance to these lectures would change if they had to pay out of their own pockets. Over half (56.9%) of OSD professionals responded that they would be willing pay between \$0-\$25, 18.5% were willing to pay \$26-50, 10.8% were willing to pay between \$51-75, 10.8% were willing to pay \$76-\$100, and only 3.1% would be willing to pay \$100+ out of pocket to attend such lectures and educational opportunities (Table 17).

Table 17. Frequency Table of Cost and Willingness to Attend Educational Lectures

Total Cost	Would Attend
\$0-\$25	37 (56.9%)
\$26-\$50	12 (18.5%)
\$51-\$75	7 (10.8%)
\$76-\$100	7 (10.8%)
\$100+	2 (3.1%)

Indicating that there is a need to provide more economically affordable educational opportunities for OSD professionals and other members of the student services department that have an interest in increase their knowledge base and expertise on concussions/MTBI.

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APPENDICES

APPENDIX A
Review of Literature

REVIEW OF LITERATURE

More frequently we are hearing and reading about concussions and mild traumatic brain injuries (MTBI) in the media. From Pee Wee football to the NFL, organizations are taking an active approach in providing the correct services and treatments to athletes recovering from an MTBI. Although much progress has been made in regards to improving the evaluation, treatment, and education of these injuries, those outside of the medical community may still be lacking knowledge of these issues.

Current Protocols and Statements for Concussions and MTBI

As medical technology and practices have advanced in the 21st century we have seen a drastic change in the manner health care professionals evaluate, diagnosis, treat, and rehabilitate head injuries. A byproduct of these advancements and collaborations has led to the development of a universally accepted protocol in regards to the removal from play of an athlete with a suspected MTBI and

their transition back to sport specific activities throughout their recovery. The 1st International Conference on Concussion in Sports developed the initial framework for the current Zurich guidelines that are followed today. A 2nd and 3rd conference were deemed necessary to amend the initial protocol, provide additional clarification of certain topics, and to ensure the Vienna guidelines were clearly defined and understood by all medical professionals.

The intentions of the 2nd International Conference on Concussion in Sports were to revise and update the guidelines and universal protocols that were developed at the 1st conference in 2001. A 2nd conference was deemed necessary to update the current agreement position, evaluations, and treatments strategies of concussions to reflect the changes in literature and findings regarding MTBI.¹ The conference also stressed the importance of developing guidelines for pediatric and adolescent athletes with MTBI as the first conference's recommendations were originally designed for the management of adult sporting concussions.¹ The 2nd conference continued to evaluate and revise current practices in regards to classifications of concussions, signs and symptoms, pre-season and baseline testing procedures, acute management of MTBI, and the

universal return to play guidelines developed at the 2001 Vienna conference.¹

A 3rd International Conference on Concussion in Sports was held in Zurich in 2008. The Zurich Consensus Statement is designed to build on the principles outlined in the original Vienna and Prague conferences and to develop further conceptual understanding of this problem using a formal consensus based approach.² This was a continuation of the guidelines set forth at the 1st International Conference on Concussion in Sports in Vienna and the 2nd International Conference in Prague. Further need for research and clarification was identified in several topics including acute simple concussion, return to play issues, complex concussion and long term issues, pediatric concussion, and future directions in concussion assessment and management.² No universal changes were made to the previously stated protocol however new questions and aspects concerning the incidence, prevalence, prevention, and treatment of concussions were identify for further research and analysis.²

Universal guidelines set forth by these conferences also resulted in the changing and alternations of several organizations' mission and position statements when dealing with concussions and MTBI. The National Athletic Trainers'

Association was one of many organizations that took these findings to heart and reevaluated the manner in which athletic trainers educate, evaluate, and manage concussions and MTBI on a case-by-case basis.

The current position statement of the National Athletic Trainers' Association on the management of sport-related concussion identifies key aspects of concussion management. These key aspects include the recognition of concussions, return to play decisions, current assessment tools, referral to a treating physicians, special conditions for younger athletes, disqualifying an athlete from returning to a contest or practice, care for the athlete at home and away from the field/AT, and enforcement of proper equipment use during practices and contests.³ No new evidence or methods were presented, however, a detailed analysis of neuropsychological tools was referenced in their importance of measuring the recovery of an athlete who has sustained a MTBI. The 2004 position statement is founded on and supported by the findings and guidelines set forth from the 2001 Vienna International Conference on Concussion in Sport.³

Incidence and Reporting of MTBI

It is seemingly almost impossible to attend a sporting event or to watch an athletic contest on television and not hear at least one person mention concussions or MTBI. We are seemingly seeing a greater increase in these injuries because today's athletes are bigger, stronger, and faster than their predecessors. But one can't truly say that today's athletes are sustaining more head injuries than what athletes did 10 to 20 years ago due to the potential increase in media coverage and social networking.²⁷ With almost everyone having access to the Internet via tablets, computers, and smart phones is it safe to say that we are simply living in a time where more injuries are being reported and made public? Regardless of what the true underlying factor to the current epidemic of MTBI, we can safely say that improved evaluation and diagnostic methods are allowing today's health professionals to identify concussions and MTBI that may have gone undiagnosed in years past.

Gessel et al⁴ investigated and compared the epidemiology of concussions of high school athletes to collegiate athletes. The subjects were sampled from 100 US high schools and 180 US colleges.⁴ Data collected were

analyzed to calculate rates, patterns, and potential risk factors for sport related concussions. Results of the study showed that concussions accounted for 8.9% of all high school athletic injuries and 5.8% of all collegiate athletic injuries.⁴ The highest incidence of concussions was in football and soccer for both high school and college athletes.⁴ In high school sports, female athletes sustained a higher rate of concussion than their male counterparts.⁴ Collegiate athletes also showed a higher rate of concussions when compared to the high school level.⁴ Results of the study show an increase in need for the development of sport related concussion preventive measures along with increasing overall knowledge of rates, patterns, and risk factors.⁴

As seen from Gessel et al⁴ the competitive environment in which an athlete is competing in may have some direct influence with the risk of sustaining a MTBI. Another key variable that Gessel et al evaluated was the gender of the athlete and its direct correlation to the risk of sustaining a MTBI and its incidence.

Covassin et al⁵ explored the gender differences regarding the incidence of concussion from 1997-2000. Subjects were both male and female collegiate athletes from soccer, lacrosse, basketball, softball, baseball, and

gymnastics programs.⁵ Weekly injury and athlete exposure data was collected from the first day of preseason to the final postseason contest for each respected sport. Results of the study showed that out of the 14591 reported injuries, 5.9% were classified as concussions.⁵ Female athletes sustained 167 concussions during practices and 305 during games compared to 148 during practices and 254 during games for males.⁵ From the data collected in this sample size we can see that female athletes were sustaining a higher rate of MTBI both during practices and during athletic competitions. Identifying and evaluating this trend may better dictate where an understaffed sports medicine staff is to determine their physical presence if multiple practices or athletic contests are occurring at the same time. By placing their staff in strategic and the highest risk locations, an AT can ensure that the safety and health of all student-athletes is being maintained and allow them to be onsite if or when a head injury should occur. The highest rate of incidence among all of the sports was seen in women's soccer and men's lacrosse.⁵ Conclusions of the study showed that female athletes sustained a higher percentage of concussions during games than male athletes.⁵

As we have seen in the two previous studies both the level in which an athlete is competing along with the gender of an athlete may factor in to which athletes are at greater risk for sustaining concussions and MTBI. By identifying these at risk athletes we can better utilize our current resources and practices to minimize their risk of injury, implement possible preventive measures, and work with educating athletes, parents, and coaches to identify the signs and symptoms of a concussion and or MTBI and promptly remove that athlete from play. Another interesting variable that has been studied has been whether there are certain sports that because of their physical nature and technical demands place athletes in greater risk for sustaining a MTBI.

Covassin et al⁶ examined the epidemiological trends of concussions among 15 different intercollegiate sports from 1997-2000.⁶ Data was collected through the National Collegiate Athletic Association Injury Surveillance System and a total of 40547 injuries were reported during the 3 year study.⁶ Concussions accounted for 6.2% of the reported injuries with women's lacrosse (13.9%) reporting the highest percentage of suffering a concussion during an athletic contest.⁶ Female athletes from all 7 sports were found to have a lower risk of suffering concussions during

practice than the 8 male sports studied.⁶ This is interesting because it conflicts the earlier findings of Covassin et al who had found that female athletes were at a higher risk of suffering concussion both during practices and games. Female athletes, however, were found to have a greater risk of suffering a concussion during games than male athletes which was mentioned earlier in Covassin's study. Injury trends indicated an increase in incidence for football, men's soccer, and both men's and women's basketball.⁶ Again we can see the importance of ensuring coverage of these at risk sports, especially in environments where there may only be one AT on staff or at the event.

Management and Reporting

The manner in which a MTBI is managed has also evolved as information and protocols have been validated through continuing research. Health care professionals no longer refer to an athlete as being "dinged" or "having their bell rung" when they have sustained a concussion or MTBI. It is also my hope that we start to refer to all concussions as MTBI so their severity is not misinterpreted or undermined and they are treated with the respect and caution their

condition merits. Medical professionals now understand and see the potential consequences of mishandling a MTBI and the potential long-term affects it can have on an athlete's quality of life both from an athletic and non-athletic standpoint. However this is not common knowledge among the general populous and an increase in educating members outside of the medical profession is of high priority.

McLeod et al⁷ stressed the importance of incorporating health-related quality of life assessments to better understand the effects a concussion has on aspects of a student's life that are outside the realm of returning to their specific sport or activity. The subject that was used in their study was a 14 year old female soccer player that had sustained a MTBI 4 weeks prior and was still symptomatic.⁷ Tools such as the SF-36, PedsQL, HIT-6, MIDAS, PedMIDAS, BDI-II, PedsQL MFS, POMS, GSS, and RPCSQ were mentioned and evaluated for their importance in identifying potential challenges and issues facing the patient and care provider in managing the effects of a concussion on quality of life.⁷ The authors stressed the use of both clinical based diagnostic tools and patient self-inquiry tools when considering the health related quality of life aspects of an athlete recovering from a concussion.⁷ Recent literature suggests that each concussed athlete be managed

individually because the effects of concussion on physical, cognitive, emotional, social, school, and family issues will differ across individuals. Outcome-based instruments can help clinicians better evaluate the effects of concussion and MTBI on all these areas, leading to better and more complete management.⁷

One of the best and often overlooked aspects of the human body is its ability to heal itself. We can see this process clearly when an individual sustains a cut or laceration. If left alone the wound will scab over, lay down new tissue, and outside of leaving a scar, return to normal as if the injury hadn't occurred at all. When dealing with concussions and MTBI, the same principle applies. However there is often confusion as to how we should let the brain rest because one can't see the healing process occur with the naked eye and often is relying on the reporting of the injured athlete to determine if they are no longer experiencing symptoms and should be allowed to resume any type of physical activity.

Logan states the importance of complete cognitive rest from an academic, social, and physical aspect when an athlete is symptomatic during the acute phase of a concussion.⁸ Contacting school officials and letting them know about the athlete's situation is also a vital aspect

of this processes in getting course work and examinations postponed or altered through the use of a 504 plan to ensure the athlete isn't being put in a position to fail. Limiting other stimuli from a physical and social aspect will ensure that the student athlete isn't manifesting symptoms or claiming to be symptomatic to simply get out of their academic responsibilities.⁸ Having the athlete learn to identify triggers that cause an increase or exacerbation of symptoms is also an important step in recovery and allows an athletic trainer to see if the athlete is progressing in their recovery or if more cognitive rest is required.⁸

McLeod also recognizes the importance and need for cognitive rest and how it should be incorporated with the current treatment strategies in concussion management. Although it is impossible to limit cognitive activities completely, the goal of cognitive rest should be to limit activity where there isn't an exacerbation or reemergence of symptoms.⁹ Use of tools such as a school's version of the ACE Care Plan can ensure that each MTBI are being handled on a case by case basis and that the proper adjustments to a student's time and intensity of cognitive tasks are made to accommodate their current level of tolerance. When considering a student athlete's return to sport specific

activities, a student's performance in the classroom should return to pre-injury levels before any exertional or functional testing is implemented.⁹

If the athlete is allowed proper time to rest while limiting their exposure to sensory stimuli, the recovery process is much smoother and unnecessary strain isn't placed on the recovering athlete. However, simply because an athlete is no longer symptomatic doesn't mean that they have completely recovered nor are they functioning at pre-injury cognitive levels.⁹

McClincy et al¹⁰ examined the cognitive performance of concussed athletes at baseline, 2, 7, and 14 days post-injury using the ImPACT testing programing. The subjects of the study consisted of 104 high school and collegiate athletes who had experienced a concussion during an athletic event.¹⁰ Variables such as verbal memory composite, visual memory composite, processing speed composite, reaction time composite, and post-concussion symptoms were all measured during the 4 stages of testing.¹⁰ Results of the study showed that differences were seen for all ImPACT composites and total symptom score between baseline and day 2 post-injury testing. At day 7 poorer performances was seen in verbal memory, visual memory, reaction time, and total symptom score.¹⁰ At day 14 only verbal memory scores

were significantly different from baseline measurements.¹⁰ Conclusions from the study showed that cognitive performance deficits in concussed athletes may persist up to 14 days post-injury in some cases.¹⁰ The importance of incorporating cognitive testing such as the ImPACT program are required because the self-reporting of an athlete or use of symptom scores may not provide an accurate assessment of the student athlete's recovery when used alone. It's feasible that an athlete may feel fine or completely recovered but without neurological testing if allowed to resume full activities both in and out of the classroom; the athlete would be placed in a position to fail, exacerbate previous symptoms or possibly sustain a potentially fatal injury.

A meta-analysis by Broglio and Puetz¹¹ systematically reviewed and quantified the effect of sport concussion on each assessment measure when administered immediately post-injury and 2 weeks following the injury. 39 articles were selected for the meta-analysis via PubMed and PsychINFO databases.¹¹ Variables extracted from the studies included study design, type of neurocognitive technique used for assessment, time the post-concussion assessment was administered following injury, and number of follow-up assessments post-concussion.¹¹ Results of the meta-analysis

found that sport concussions had a large negative effect on neurocognitive functioning. Conclusions of the meta-analysis supported that the assessment of neurocognitive functioning, self-report symptoms, and postural control all warrant inclusion and should be used synergistically during the evaluation process of a concussion.¹¹

Changes in Cognitive Functions Following MTBI

The management of a MTBI must encompass a holistic approach to the health and wellbeing of the athlete. As the brain begins the process of healing it is the responsibility of the health care professional to create and enforce an environment that is conducive to this healing process. Unlike an ankle sprain or muscle strain, a MTBI must be fully healed before an athlete will be cleared to fully return to their respective sport. The previous articles have stressed the importance of cognitive rest before any physical stresses are to be placed on the recovering athlete. To place an athlete who has not regained their cognitive ability to process the multitude of information and stimuli they experience during athletics would be negligent and potentially catastrophic.

Kowk et al¹² evaluated the cognitive functioning of MTBI patients immediately post injury, 1 month, and 3 months post injury. 31 adult subjects (25 male and 6 female) were selected for the study and were between the ages of 18-65 years old.¹² A control group of 32 subjects (19 males and 13 females) was used to compare the findings from the two groups.¹² Kowk et al measured cognitive function by evaluating attention (Stroop Word-Color Test, Digit Vigilance Test, Symbol Digit Modalities Test), memory (Chinese Auditory Verbal Learning Test, Benton Visual Retention Test) and executive functions (Verbal Fluency Test).¹² Kowk et al found that the MTBI patients performed significantly worse in all three aspects of cognitive functioning immediately post-injury.¹² 1 month post injury there was significant improvement in cognitive functioning of the MTBI group but there was still a significant difference from the control group.¹² 3 months post injury there were similarities in results between the MTBI and control groups in all aspects of cognitive functioning except for attention where the MTBI group continued to perform worse.¹²

The impact and impairment that a single MTBI has on an athlete is well supported in the previously mentioned literature. Variations on the level of impairment are

dependent on the situation and individual. These impairments can encompass the physical, mental, and emotional aspects of a student-athlete's life. When an athlete has sustained multiple MTBI the affects and consequences can be severe and debilitating. If not treated correctly, complete disqualification from participation in athletics and long-term neurocognitive impairments may result in certain cases.

Iverson et al¹³ examined the possibility that athletes with multiple concussions show cumulative effects of injury.¹³ Subjects consisted of high school and college athletes, 19 with a history of three or more concussions and 19 with no prior concussions. Athletes from both groups were carefully matched by gender, age, education and sport and completed ImPACT testing at preseason and then within 5 days of sustaining a concussion. At baseline athletes with multiple concussions reported more symptoms than athletes with no history of concussion.¹³ At approximately 2 days post-injury athletes with multiple concussions scored significantly lower on memory testing than athletes with a single concussion.¹³ This study provides preliminary evidence to suggest that athletes who have sustained multiple concussions may suffer from cumulative effects.

Whether an athlete sustains a single occurrence or multiple episodes of MTBI the athlete has an increased risk of neurocognitive impairment. When an athlete is symptomatic it is easier for a medical professional to identify these impairments and recommend the necessary care to minimize the external stimuli exposure and expedite the athlete's recovery. However when an athlete is no longer reporting as symptomatic the medical professional has to utilize diagnostic testing to ensure a full recovery has been achieved.

Broglia S, Macciocchi S, and Ferrara M¹⁴ evaluated the presence of neurocognitive decrements in concussed athletes no longer reporting concussion related symptoms. Subjects were 21 NCAA DI collegiate athletes (16 males and 5 females).¹⁴ ImPACT concussion assessment test was administered to concussed athletes at baseline, when symptomatic, and when asymptomatic. Index scores of verbal memory, visual memory, visual-motor speed, reaction time, and concussion related symptoms were recorded at each session.¹⁴ When assessed within 72 hours of concussion, 81% of athletes showed deficits on at least 1 ImPACT variable.¹⁴ When asymptomatic, 38% of the concussed athletes continued to demonstrate impairment on at least 1 ImPACT variable.¹⁴ Conclusions of the study advocate neurocognitive decrements

may persist when athletes no longer report concussion related symptoms.¹⁴

With the potential for neurocognitive impairment from a MTBI the performance of the student athlete both on the field and in the classroom must be taken into consideration. A correlation between multiple MTBI and learning impairments must be evaluated further.

Collins¹⁵ assessed the relationship between concussion history and learning disability, the association of these variables with neuropsychological performance and to evaluate post-concussion recovery. Subjects were 393 athletes from 4 university 4 football programs.¹⁵ Variables studied included clinical interviews, 8 neuropsychological measures, and concussion symptom scale ratings at baseline and after concussion.¹⁵ Results showed a significant interaction between learning disability and history of multiple concussions and learning disability on 2 neuropsychological measures (Trial-Making Test and Symbol Digit Modalities Test).¹⁵ Conclusions of the study showed that both history of multiple concussions and learning disabilities are associated with reduced cognitive performance.¹⁵

The number of concussive episodes experienced by the student-athlete may also play a role in post-concussive

functioning and symptom severity. Utilizing diagnostic tools like ImPACT allow medical professionals to evaluate the recovering student-athlete from all aspects of recovery and can potential identify impairments that would go undiagnosed by outdated assessment measures.

Covassin T, Stearne D, Elbin III R¹⁶ evaluated the relationship between concussion history and post-concussion neurocognitive performance and symptoms in collegiate athletes. Subjects for the study were 57 concussed collegiate athletes (36 without concussion history, 21 with a history of 2 or more concussions).¹⁶ All subjects were administered ImPACT testing and those who sustained a concussion were administered 2 follow up tests at days 1 and 5 post injury.¹⁶ Independent variables in the study were history of concussion and when the ImPACT test was implemented. Results found that athletes with a concussion history performed significantly worse on verbal memory and reaction time at day 5 post-concussion compared to athletes with no previous history.¹⁶ Conclusions of the study stated concussed collegiate athletes with a history of 2 or more concussions took longer to recover verbal memory and reaction time.¹⁶

Neuropsychological Differences and Challenges

Following a MTBI

College students with learning disabilities and those with a history of MTBI are two groups whose learning problems are not adequately addressed or understood by all. Beers S, Goldstein G, Katz L¹⁷ gathered subjects for a study which consisted of 35 students with learning disabilities, 25 with mild head injuries, and a control group of 22. Six neuropsychological and psychoeducational test variables produced statistically significant differences among the three groups. Results found that students with learning disabilities performed poorly on linguistically oriented psychoeducational tests, whereas students with MHI showed cognitive deficits in visual-spatial skills and in areas of attention, memory, and problem solving.¹⁷ Findings of the study support the development of unique interventions and treatment protocols when addressing the needs and deficits of each group.¹⁷

Bay and Donder's¹⁸ research determined the extent to which pre-injury psychosocial factors, injury-related variables and post-injury litigation, perceived stress, fatigue, pain, and information processing speed contributed to depressive symptoms after a MTBI. Subjects included 84

adults recruited from outpatient clinics.¹⁸ Results of the study found that perceived stress, pain, and litigation status made independent contributions to the level of depressive symptoms.¹⁸ The findings suggest a need for earlier identification of as well as preventative education for those who are stress-vulnerable.¹⁸

Mainwaring L, Bisschop S, Richards D, et al¹⁹ compared emotional functioning of college athletes with MTBI to that of uninjured teammates and undergraduates. Participants in this study were three groups of students from the University of Toronto: Concussed athletes (12 males, 4 females), uninjured teammates (211 males, 114 females) and healthy, physically active undergraduates (8 males, 20 females). Pre and post-injury emotional response were assessed with the short version of the Profile of Mood States which consisted of 40 adjectives organized into seven subscales (tension, depression, anger, vigor, fatigue, confusions, and self-esteem).¹⁹ Each adjective was rated on a 5-point Likert scale from 0 (not at all) to 4 (extremely). Analysis revealed a significant acute post-concussion spike for POMS ratings of depression, confusion, and aggregate total mood disturbance.¹⁹ Conclusions of the study showed that concussed athletes were not emotionally different from their peers before injury, but they were

more depressed and confused than their non-injured peers after sustaining MTBI.¹⁹

Post Concussive Syndrome and Issues

Although the majority of athletes will have a complete recovery after suffering a MTBI, there are still cases where impairment may continue to linger. The development of post concussive syndrome (PCS) can vary from case to case but often will result in some aspect of chronic impairment and a reoccurrence of certain symptoms. Identifying which athletes may be at risk of developing some form of PCS is still an imperfect science at this point, but there have been several studies conducted to try to identify certain markers that may give us a better understanding of why PCS occurs.

Stalnacke et al²⁰ looked at 88 patients (53 male and 35 female) immediately after sustaining a MTBI. Blood samples were taken and S-100B and neurone-specific enolase were measured to see if there was a correlation between evaluated levels of these two factors and the presence and severity of brain tissue damage. The inclusion criteria for the study included individuals who had sustained blunt head trauma, were over the age of 18 years old, and had a rating

between 13-15 on the Glasgow Coma Scale.²⁰ 69 of the patients participated fully in the follow up study that was conducted 15 months later (+/- 4 months).²⁰ The findings of the follow up showed that 31 patients suffered from 1 or more post concussive symptoms (Rivermead Post Concussion Symptoms), 33 patients suffered from 1 or more disabilities (Rivermead Head Injury Follow Up), and only 55% of the patients reported that they were very satisfied or satisfied with life as a whole following their MTBI (LiSat-11).²⁰ Stalnacke et al²⁰ also found that the presence of S-100B and neurone-specific enolase shortly after trauma are better predictors of potential disability rather than symptoms following a MTBI.²⁰

The identifying markers of S-100B and neurone-specific enolase have shown promise in aiding to identify at risk patients who have sustained a MTBI and may be at risk of developing PCS.²⁰ However the use of these tests in a small school setting or in an environment without the necessary resources to conduct such testing isn't feasible. The use of neurocognitive testing such as ImPACT may provide insight into athletes who are still feeling the effects of a concussion even if they are adamantly denying symptoms.

Fazio et al²¹ examined the differences in neurocognitive performance between symptomatic concussed

athletes, concussed athletes with no subjective symptoms, and a non-concussed control group of athletes.²¹ Concussed athletes were evaluated within one week of injury using the ImPACT computerized test. Results indicated that concussed athletes who denied subjective symptoms demonstrated poorer performance than control subjects on all four composite scores of the ImPACT test (Verbal Memory, Visual Memory, Reaction Time, and Processing Speed).²¹ However the asymptomatic group performed significantly better than the symptomatic group. Results of the study supported that concussed athletes who did not report subjective symptoms were not fully recovered based on neurocognitive testing.²¹ Fazio's findings underscores the importance of neurocognitive testing in the assessment of concussions.²¹

Although the presence of certain physiological markers may determine why an athlete develops PCS, it is also imperative that other internal and external stimuli be evaluated for their potential influence in the development of symptoms.

Hou et al²² investigated the contributions of cognitive, emotional, behavioral and social factors to the development of PCS. One hundred seven MTBI patients participated in a cohort study with measurements at 2 weeks post injury and follow up questionnaires at 3 months and 6

months.²² Variables were measured using the Brief Illness Perception Questionnaire (BIPQ), Behavioral Response to Illness Questionnaire (BRIQ), Hospital Anxiety and Depression Scale (HADS), Brief Social Support Questionnaire (SSQ), and Rivermead Post Concussion Symptoms Questionnaire (RPQ).²² 24 patients met the criteria for PCS at 3 months and 22 at 6 months post-injury.²² Negative MTBI perceptions, stress, anxiety, depression and all or nothing behavior were associated with the risk of PCS.²² Conclusions of the study support that a patient's perceptions of their head injury and their behavioral responses play important roles in the development of PCS.²²

An exploratory study by Greiffenstein and Baker²³ examined the relationship between proven academic performances and present neuropsychological test scores in neurologically intact late PCS subjects. In this study final cumulative grade point average was regressed on to Halstead-Reitan Battery (HRB), IQ and other neuropsychological test scores in 60 non-malingering post-concussive subjects and 17 subjects with moderate-severe closed head injury.²³ The findings of the study suggest the quality of premorbid academic performance also provides an important context in which to view present neuropsychological performance. Marginal premorbid

achievement may be a risk factor for late developing PCS and litigation.²³

Logan²⁴ reviewed and discussed current methods in recognition and management of PCS. There were no subjects studied directly and the article follows more of a literature review format. Key subtopics of the article included diagnosing PCS, the importance of cognitive and physical rest in PCS treatment, medications in PCS treatment, sleep problems, and neuropsychological problems.²⁴ PCS is a complex problem that AT and therapists need to understand. Prompt recognition of PCS can initiate treatment that will decrease symptoms and enhance the athlete's quality of life during the recovery period.²⁴

A retrospective cohort design conducted Majerske C, Mihalik J, Wagner A, et al²⁵ was to examine the role post-injury activity levels play in PCS and performance on neurocognitive tests. Ninety-five student athletes (80 males, 15 females) were selected as subjects for the study.²⁵ PCS scores and neurocognitive scores served as the primary outcomes. Independent variables included age, gender, concussion grade, self-reported history of concussions, return to play status, type of sport in which concussion occurred, level of post-injury activity, and time of evaluation (in days).²⁵ Level of exertion was

significantly related to all outcome variables and remained significant with respect to visual memory and reaction time. Conclusions from the study showed that activity levels after concussion affected symptoms and neurocognitive recovery.²⁵

Perception of MTBI and Services Required

Members outside of the medical community still may attach certain stigmas to athletes that have sustained a MTBI. There are some who may feel that the athlete is faking the symptoms to gain an unfair advantage in the classroom or have alternative motives. Others may simply not understand the severity and complexity of a MTBI and the recovery process. Many questions still remain in regards to what services should be provided to the recovering student-athlete and how long these services need to be provided. Often confusion and differences in opinion for what services are needed can be seen between the injured athlete and the parents or family members that are also impacted by these injuries.

Gagnon et al²⁶ explored the specific service needs of adolescents (12-18 years old) after a MTBI. Subjects included 15 adolescents and their parents. They were

interviewed separately on the following themes: the impact of a MTBI on the various spheres of the adolescent's life, needs following a MTBI, quality of services received since their injury, and any additional services they wish they had received to ensure optimal recovery.²⁶ Information regarding the injury was also extracted from the adolescent's medical file and included initial Glasgow Coma Scale Score, duration of loss of consciousness and post traumatic amnesia, initial symptoms, and cause of injury.²⁶ Results of the study found that all adolescents and parents expressed the need to receive information about the injury, its expected recovery and when to return to activities. Many adolescents reported wanting to be seen rapidly by professionals who genuinely care about them and who acknowledge that they have specific needs.²⁶ Conclusions from the study suggest that professionals involved in the management of adolescents with MTBI should be aware of their needs in order to provide optimal services.²⁶

Social media has become an influential aspect of today's society. Ideas, thoughts, news, and other information can easily be shared and accessed by anyone with access to the Internet. Creations of electronic social media sites such as Facebook and MySpace have provided people with similar interests, issues, and concerns the

ability to connect with one another with the mere click of a mouse.

Ahmed et al²⁷ used content analysis to scrutinize postings on Facebook groups related to concussion and examine the purpose of these postings. Four hundred and seventy-two Facebook groups related to concussions were screened in the study and 17 groups were selected for having met the inclusion criteria of the study.²⁷

Demographic information and the purpose of the posting were the main variables evaluated in the study. Results showed that the predominant demographic group was North American males.²⁷ Individuals utilized the Facebook groups to relate personal experiences of concussions, seek advice, or offer advice in regards to concussions.²⁷ The evolving nature of healthcare support in the 21st century and the rich information present relating to concussions and MTBI on social networking sites such as Facebook have provided a new wrinkle in increasing public awareness of the challenges and impairments facing those recovering from these injuries.

The use or misuse of terms can also influence the perceptions and feeling one has towards a topic. If a term is used that is not well understood by the general population, confusion and an inaccurate response to the

term is a likely outcome. However interchangeable and similar terms can be used to measure the response they generate when they are presented to a certain demographic.

Research conducted by Weber and Edwards²⁸ determined the influence of the terms concussion, MTBI, and minor head injury on expected injury outcome, term-related familiarity and actual symptom reporting. Subjects were 224 university student athletes from the University of Birmingham.²⁸ Participants rated injury outcome statements for their truthfulness, specified term familiarity and completed measures on PCS, anxiety, depression, pain, and affectivity.²⁸ Results of the questionnaire showed that terminology significantly influenced both expected injury outcome and familiarity. Outcome expectations were reliably more negative for the term MTBI than concussion or minor head injury.²⁸ The data showed that the use of terminology affected athlete's injury outcome expectations and familiarity.²⁸

Academic Support and Accommodations

Kirkwood et al²⁹ proposed a clinical management model aimed at the non-acute clinical care of pediatric MTBI focused on both evaluation and intervention from the time

of injury through recovery. Variables consisted of four relevant domains: the individual youth, family, school, and athletics.²⁹ Subjects referenced in the article were pediatric or adolescent in age. Findings showed that a lack of sufficient data to derive evidenced-based management recommendations for children and adolescents exists.²⁹ Conclusions of the study showed that clinical management has primary value in its potential to speed recovery, minimize distress during recovery, and reduced the number of youth who experience longer-lasting post-concussive problems.²⁹ However pediatric MTBI management must still rely heavily on indirect empirical data from adult and more severely injured pediatric populations.²⁹

McGrath³⁰ looked to provide a framework for AT when advising colleagues about the health and academic needs of student-athletes suffering from MTBI. Issues such as concussion education, preseason baseline testing, post injury testing, academic accommodations, and return to play must all be given equal consideration when dealing with MTBI.³⁰ Particularly in the realm of academic accommodations there are several steps or alternations that can be made depending on the severity of symptoms and subsequent disability that a student athlete may be suffering from. Along with the importance of making the connection that

recovery from a MTBI is just as easily influenced by cognitive stresses as the physical ones.³⁰

Duff³¹ mentions the numerous challenges health care professionals and academic institutions face when dealing with concussions in the pediatric and adolescent population. Understanding the impact of age, previous history of head injuries, and the current guidelines established by the 2001 Vienna conference are instrumental in providing the proper care and accommodations to recovering young athletes.³¹ The need for potential academic alterations or accommodations for the symptomatic athlete are strongly supported by the guidelines set forth by Kirkwood et al when reintroducing the student athlete back into the school environment.³¹ Protecting the rights of a student athlete who has sustained a MTBI must also be taken into considering and is protected under Section 504 of the Rehabilitation Act.³¹ Incorporating all members of an institution from the athletic trainers to speech language pathologist must be considered when a student athlete is recovering from a MTBI.³¹

Laubscher et al³² studied the effects of very mild traumatic brain injuries (vMTBI) and MTBI on academic performance in secondary school male rugby players. Forty-five subjects were used in the study and separated into

three groups: vMTBI (26 subjects), MTBI (nine subjects), and a control group that was not involved with athletics (ten subjects).³² All subjects were from the 11th and 12th grade, were males, and attended the same school and partook in the same academic courses. The findings of Laubscher et al showed a significant decrease in academic performance of the two concussion groups compared to the control group when tested in the subject of Afrikanns.³² There was no significant decrease in the three other courses measured (Math, Science, and English) and challenges regarding the small sample size were also noted for a need of future research into the subject matter.³²

Summary

After reviewing the current literature on MTBI and concussions there is a plethora of information available to AT and other health care providers. However, this knowledge and information may seem commonplace among health care providers but due to obscure and foreign terminology may confuse other professional faculty and staff at a university. An AT may need to reach out to other sectors of a university to educate on the current recovery protocols and impairments that a student athlete suffers from after sustaining a MTBI.

The descriptive study and survey the researcher generated provided a glimpse at the current knowledge base of one of these other sectors at a university, the OSD. The goal of this study was to gain a better understanding of the current knowledge base and familiarity of these professionals while addressing future needs for research and educate. With this information a more holistic approach between the two sectors could be formulated to meet the demands and needs of post-secondary student-athletes.

APPENDIX B

The Problem

STATEMENT OF THE PROBLEM

The purpose of the study was to examine the current perceptions professionals working in the OSD have in regards to concussions and or MTBI. The study also examined and the most commonly requested and approved disability access accommodations provided by a university's OSD for post-secondary student athletes recovering from a concussion/MTBI. It is important to examine this problem because the effects of a concussion/MTBI may impair an athlete not only from an athletic standpoint but also interfere with academic success and activities of daily living. Collaborating between the sports medicine staff and OSD will provide a holistic approach to the education, evaluation, treatment, and recovery from concussions/MTBI.

Definition of Terms

The following definitions of terms were defined for this study:

- 1) Concussion/Mild Traumatic Brain Injury- "A complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces".²
- 2) Disability access accommodations- Academic accommodations recommended by the Office of Student

Disabilities to students recovering from a mild traumatic brain injury.

Basic Assumptions

The following are basic assumptions of this study:

- 1) The subjects will be honest when they complete their survey.
- 2) The subjects will answer all questions completely and to the best of their ability.
- 3) The subjects will complete and submit the survey during the requested submission deadline.
- 4) The sample obtained for this research was a representation of the population.
- 4) The survey had content validity after being reviewed by a panel of experts.
- 5) All subjects had access to technology and were able to access the SurveyMonkey® survey.
- 6) Subjects were representative of OSD professionals.

Limitations of the Study

The following were possible limitations of the study:

- 1) There were no current research studies specifically regarding this topic.

- 2) OSD professionals who were not in the Mideast or Great Lake regions as classified by the National Center for Educational Statistics CollegeNavigator Tool will not have access to the survey.
- 3) The validity and reliability of the instrument has not been established. A preliminary study was conducted in the Pennsylvania State Athletic Conference (PSAC), but an adequate number of responses weren't received.
- 4) The survey was completed online and there was no supervision by the primary research to ensure that the survey was completed in its entirety.
- 5) Only OSD professionals with a valid email address received the survey.

Delimitations of the Study

The following was a possible delimitations of the study:

- 1) The subjects utilized in this study were from only the Mideast and Great Lake Regions.

Significance of the Study

The significance of this study identified the current perceptions of professionals in the OSD on concussions and MTBI. The study also determined the most commonly requested and approved disability access accommodations for

recovering post-secondary student-athletes. This initial research and information will allow ATs and university administration to examine areas where an increase in communication between the two sectors can be enhanced and to ensure the professionals in the OSD are update with the latest protocol and management techniques for MTBI. Identifying the most commonly requested and approved disability access accommodations will also give ATs a better understanding of what services can be provided and that a holistic approach of treatment is established between the AT and the OSD.

APPENDIX C
Additional Methods

APPENDIX C1

Informed Consent Form



California University of Pennsylvania

April 1, 2013

Dear Office of Student Disabilities Professional:

My name is Andrew Jakiel and I am currently a graduate student at California University of Pennsylvania pursuing a Master of Science in Athletic Training. Part of the graduate study curriculum is to complete a research thesis through conducting research. I am conducting survey research to determine the current perceptions of the office of student disabilities (OSD) professionals on concussions and or mild traumatic brain injuries. The survey will also identify which disability access accommodations are most commonly requested and approved for the recovering post-secondary student-athlete. The survey will be generated through SurveyMonkey.com and will be distributed to current professionals working full-time in a university's OSD by the primary research to the Mideast and Great Lake regions as defined by the National Center for Education Statistics College Navigator Tool. The Mideast and Great Lake regions will be composed of the following states: IL, IN, NY, NJ, PA, DC, DE, MD, MI, OH and WI. The survey will be distributed to only four year universities that currently have Men's and Women's Varsity and Junior Varsity Athletic Teams.

Your participation is voluntary and you do have the right to choose not to participate. You also have the right to discontinue participation at any time during the survey completion process at which time your data will be discarded. The California University of Pennsylvania Institutional Review Board has reviewed and approved this project. The approval is effective 02/04/13 and expires 02/03/14.

All survey responses are anonymous and will be kept confidential, and informed consent to use the data collected will be assumed upon return of the survey. Aggregate survey responses will be housed in a password protected file on the CalU campus. Minimal risk is posed by participating as a subject in this study. I ask that you please take this survey at your earliest convenience. If you have any questions regarding this project, please feel free to contact the primary researcher Andrew Jakiel at JAK5070@calu.edu. You can also contact the faculty advisor for this research (Ellen J. West, EdD, ATC, LAT, 724-938-4356, west_e@calu.edu). Thanks in advance for your participation. Please click the following link to access the survey

<https://www.surveymonkey.com/s/FWGQNW2>

Thank you for taking the time to take part in my thesis research. I greatly appreciate your time and effort put into this task.

Sincerely,
Andrew Jakiel LAT, ATC, PES
Primary Researcher
California University of Pennsylvania
250 University Ave
California, PA 15419

APPENDIX C2

Institutional Review Board -
California University of Pennsylvania

**Institutional Review Board
California University of Pennsylvania
Morgan Hall, Room 310
250 University Avenue
California, PA 15419
instreviewboard@calu.edu
Robert Skwarecki, Ph.D., CCC-SLP, Chair**

Dear Dear Mr. Andrew James Jakiel:

Please consider this email as official notification that your proposal titled " Survey of student disabilities services current perceptions on concussions and/or mild traumatic brain injuries and current disability access accommodations available to recovering collegiate athletes" (Proposal #12-036) has been approved by the California University of Pennsylvania Institutional Review Board as submitted.

The effective date of the approval is 2-4-2013 and the expiration date is 2-3-2014. These dates must appear on the consent form .

Please note that Federal Policy requires that you notify the IRB promptly regarding any of the following:

- (1) Any additions or changes in procedures you might wish for your study (additions or changes must be approved by the IRB before they are implemented)**
- (2) Any events that affect the safety or well-being of subjects**
- (3) Any modifications of your study or other responses that are necessitated by any events reported in (2).**
- (4) To continue your research beyond the approval expiration date of 2-3-2014 you must file additional information to be considered for continuing review. Please contact instreviewboard@calu.edu**

Please notify the Board when data collection is complete.

Regards,

**Robert Skwarecki, Ph.D., CCC-SLP
Chair, Institutional Review Board**

APPENDIX C3

Panel of Experts Letter

November 29, 2012

Dear _____,

I am a graduate athletic training student at California University of Pennsylvania pursuing a Master of Science degree in athletic training. To fulfill the thesis requirement for this program, I am conducting a descriptive study. The objective of this study is to determine the perceptions professionals working in the Office of Student Disabilities have in regards to mild traumatic brain injuries. The survey will also identify which disability access accommodations are typically recommended for post-secondary student athletes recovering from a mild traumatic brain injury.

In order to increase the content validity of the instrument, a panel of experts has been chosen to review the survey. You have been selected as one of the three professionals to be on this panel. Your feedback is vital to the success of this study. The information obtained by this panel of experts review will be used to make revisions and create the final survey to be distributed to the population sample. Your responses are voluntary and will be confidential.

Please answer the following questions based on the attached survey and make any other additional comments you deem appropriate. Please return your comments and revisions via email no later than December 5th 2012. If you have any questions or concerns, please do not hesitate to contact me at JAK5070@calu.edu.

1. Are the questions appropriate, valid, and understandable? Please Explain.
2. Comment on the overall presentation of the survey.
3. Which questions, if any, should be restated from the survey? Why? What suggestions would you make?

4. Which questions, if any, should be added to the survey? Why? What suggestions would you make?

Very Respectfully,

Andrew James Jakiel ATC, LAT
CAL U
Graduate Assistant
Cross Country, Track & Field, Tennis

APPENDIX C4

Email to Participants

Hello,

My name is Andrew Jakiel and I am a graduate student at California University of Pennsylvania. I am conducting a research study for my Masters thesis about the current perceptions of Office of Student Disabilities professionals on concussions/and or mild traumatic brain injuries and the accommodations recommended for recovering student athletes. I have obtained IRB approval for my study and the survey should only takes 5 minutes of your time. Below is a link that will take you directly to the survey describing your role as a participant. Thank you for your participation.

<https://www.surveymonkey.com/s/FWGQNW>

[2](#)

Very Respectfully,

Andrew James Jakiel LAT, ATC, PES
CAL U
Graduate Assistant
Cross Country, Tennis, Track and Field

APPENDIX C5

Jakiel OSD Perceptions Concussion and/or MTBI Survey

OSD MTBI/Concussion & Accommodations (Jakiel)**Cover Letter**

Dear Office of Student Disabilities Professional:

My name is Andrew Jakiel and I am currently a graduate student at California University of Pennsylvania pursuing a Master of Science in Athletic Training. Part of the graduate study curriculum is to complete a research thesis through conducting research. I am conducting survey research to determine the current perceptions of the office of student disabilities (OSD) professionals on concussions and or mild traumatic brain injuries. The survey will also identify which disability access accommodations are most commonly requested and approved for the recovering post-secondary student-athlete. The survey will be generated through SurveyMonkey.com and will be distributed to current professionals working full-time in a university's OSD by the primary research to the Mideast and Great Lake regions as defined by the National Center for Education Statistics College Navigator Tool. The Mideast and Great Lake regions will be composed of the following states: IL, IN, NY, NJ, PA, DC, DE, MD, MI, OH and WI. The survey will be distributed to only four year universities that currently have Men's and Women's Varsity and Junior Varsity Athletic Teams.

Your participation is voluntary and you do have the right to choose not to participate. You also have the right to discontinue participation at any time during the survey completion process at which time your data will be discarded. The California University of Pennsylvania Institutional Review Board has reviewed and approved this project. The approval is effective 02/04/13 and expires 02/03/14.

All survey responses are anonymous and will be kept confidential, and informed consent to use the data collected will be assumed upon return of the survey. Aggregate survey responses will be housed in a password protected file on the CalU campus. Minimal risk is posed by participating as a subject in this study. I ask that you please take this survey at your earliest convenience. If you have any questions regarding this project, please feel free to contact the primary researcher Andrew Jakiel at JAK5070@calu.edu. You can also contact the faculty advisor for this research (Ellen J. West, EdD, ATC, LAT, 724-938-4356, west_e@calu.edu). Thanks in advance for your participation.

Thank you for taking the time to take part in my thesis research. I greatly appreciate your time and effort put into this task.

Sincerely,
Andrew Jakiel LAT, ATC
Primary Researcher
California University of Pennsylvania
250 University Ave
California, PA 15419
JAK5070@calu.edu

OSD MTBI/Concussion & Accommodations (Jakiel)

*** 1. Are you 18 years old or older?**

Yes

No

OSD MTBI/Concussion & Accommodations (Jakiel)***2. What is your gender?**

- Male
 Female

***3. What NCAA Division is your institution?**

- Division I
 Division II
 Division III
 NAIA
 Other

***4. How many staff members are employed at your university's office of student disabilities?**

- 1
 2-3
 4-5
 5+

***5. What is the employment status of your OSD staff? (Please designate number of staff in each category)**

Full-time professional staff	<input type="text"/>
Part-time professional staff	<input type="text"/>
Full-time faculty	<input type="text"/>
Part-time faculty	<input type="text"/>

OSD MTBI/Concussion & Accommodations (Jakiel)

***6. Are you familiar with concussions and or mild traumatic brain injuries?**

Yes

No

***7. Have you yourself ever sustained, been treated for, or diagnosed with a concussion and or a mild traumatic brain injury?**

Yes

No

***8. Are you familiar with current Zurich concussion and or mild traumatic brain injury management or return to play protocols?**

Yes

No

***9. Have you worked with an athletic trainer or sports medicine staff member regarding concussion and/or mild traumatic brain injury management and protocol for student-athletes?**

Yes

No

***10. How often do you have contact with your university's athletic training staff or sports medicine staff regarding student-athletes who have been diagnosed with concussions and/or mild traumatic brain injuries?**

Daily

Approximately once a week

Approximately once a month

Approximately once a semester

Approximately once a Year

Never

OSD MTBI/Concussion & Accommodations (Jakiel)

***11. How comfortable are you in managing and directing a student-athlete suffering a sports related concussion and/or mild traumatic brain injury from an OSD standpoint?**

- Very Uncomfortable
 Uncomfortable
 Neither Comfortable or Uncomfortable
 Comfortable
 Very Comfortable

***12. When you see the term "Concussion" what do you equate the injury to? (check all that you feel apply)**

- Mild Injury
 Getting your Bell Rung
 Getting Dinged
 No Opinion
 Moderate Injury
 Severe Injury

***13. What is the average number of concussions/mild traumatic brain injuries seen each year by your office of student disabilities?**

- 0
 1-5
 6-10
 11-15
 15+

***14. What is the average number of visits a student-athlete recovering from a concussion or mild traumatic brain injury uses your office of student disabilities?**

- 0 visits
 1-4 visits
 5-9 visits
 10+ visits

OSD MTBI/Concussion & Accommodations (Jakiel)

***15. Do you have a liaison between your office of student disabilities and the athletic training staff?**

Yes

No

OSD MTBI/Concussion & Accommodations (Jakiel)

***16. Do you feel enough is being done to educate faculty and staff members at your university on the topic of concussions and or mild traumatic brain injuries?**

- Yes
 No

***17. When you see the term "Mild Traumatic Brain Injury" what do you equate the injury to? (check all that you feel apply)**

- Mild Injury
 Getting your Bell Rung
 Getting Dinged
 No Opinion
 Moderate Injury
 Severe Injury

***18. What Disability Access Accommodations are most commonly requested and approved?**

- Power Point Lectures
 Recorded Lectures
 Extra Testing Time
 Quiet Testing Environment
 Extended Deadlines
 No Initial Cognitive Activity
 Other (please specify)

Other (please specify)

***19. Have you attended educational lectures on concussions and or mild traumatic brain injuries held at your university?**

- Yes
 No

OSD MTBI/Concussion & Accommodations (Jakiel)

***20. Would you have interest in attending educational seminars on concussions and or mild traumatic brain injuries?**

Yes

No

OSD MTBI/Concussion & Accommodations (Jakiel)

***21. Would your attendance of these lectures change if you had to pay out of your own pocket?**

Yes

No

OSD MTBI/Concussion & Accommodations (Jakiel)

***22. How much would you be willing to pay out of your own pocket to attend an educational seminar on concussions and or mild traumatic brain injuries?**

- \$0-\$25
- \$26-\$50
- \$51-\$75
- \$76-\$100
- \$100+

OSD MTBI/Concussion & Accommodations (Jakiel)

***23. Do you feel there is a need for enhanced communication between the office of student disabilities and the athletic training staff?**

Yes

No

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ABSTRACT

TITLE: SURVEY OF STUDENT DISABILITIES SERVICES CURRENT PERCEPTIONS ON CONCUSSIONS AND/OR MILD TRAUMATIC BRAIN INJURIES AND CURRENT DISABILITY ACCESS ACCOMMODATIONS AVAILABLE TO RECOVERING COLLEGIATE ATHLETES

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PURPOSE: The purpose of this study is to assess the current perceptions and familiarity of student disability services professionals in regards to concussions and/or MTBI and to identify the most commonly requested and approved disability academic access accommodations available to post-secondary student-athletes.

DESIGN: Descriptive Survey

SETTINGS: Population-Based Survey

PARTICIPANTS: Three hundred ninety-nine OSD professionals working at the collegiate setting in the Great Lakes and Mideast Regions (N=399). The final response rate was 118 completed surveys (n=118).

INTERVENTIONS: The variables of the study can be found in the Jakiel OSD Perceptions Concussions and/or MTBI Survey. There were no identified independent or dependent variable.

RESULTS: Hypothesis 1 was statistically significant, indicating that NCAA Division I OSD professionals were more likely to engage in contact in a more frequent manner with their university's athletic training staff when compared to the other NCAA Divisions or collegiate affiliations surveyed. In addition NCAA Division or collegiate

affiliation does not significantly impact an OSD professional's comfort level in managing a recovering student-athlete from an OSD standpoint.

CONCLUSIONS: Based on the results of this study there is a need to increase communication between the office of student disabilities and athletic trainers in regards to providing care from a holistic standpoint for recovering student-athletes that have sustained a concussion/and or MTBI.