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SURVEY DETERMINING INVOLVEMENT OF CERTIFIED ATHLETIC TRAINERS IN RETURN TO ACTIVITY/PLAY DECISIONS AND CONCUSSION EDUCATION

Danielle Olla, MS IV, University of Arizona College of Medicine-Phoenix
Hirsch Handmaker, M.D., The CACTIS Foundation

ABSTRACT

In some states a Certified Athletic Trainer (AT) has the ability to determine if a player can return to activity or play (RTP) following a concussion also known as a mild Traumatic Brain Injury (mTBI). Premature return to activity or RTP can result in further axonal damage, prolonged complications and death. There is no standardized education for ATs regarding concussion management and no data exists determining how often ATs are involved in return to activity or RTP decisions. The aim of this study was to survey ATs and establish a baseline of their involvement in return to activity and RTP decisions and determine what type and amount of concussion education ATs are completing. A 20-question electronic survey was sent to 2084 randomly selected ATs registered with the National Athletic Trainer Association (NATA). 382 responses were collected in a 38-day period. The survey was completed by a total of 356 ATs from across the United States. This resulted in a 17.4% response rate. 89.3% of ATs were found to participate in at least 1 return to activity or RTP decision. Concussion education varied widely but 53% of ATs reported completing 20+ hours of concussion education. The final results showed statistically significant differences between the more years serving as an AT and answering that loss of consciousness is not an indicator of a more serious injury. This was also true for ATs working with NCAA Division I, II, and III teams. These results show that further research and analysis is needed to ensure ATs are receiving adequate education to identify and manage mTBI in athletes of all genders, sports and skill levels, with an emphasis on return to play and activity decisions.

INTRODUCTION

Concussion, also known as mild Traumatic Brain Injury (mTBI), is defined as any transient neurologic dysfunction resulting from a biomechanical force. Appropriate identification of an mTBI and determination of appropriate return to activity or RTP is important to protect athletes from delayed or further axonal damage and reduce the risk of subsequent life-threatening complications such as Second Impact Syndrome (SIS) which results in death. Between 2009 and 2014, 50 states and the District of Columbia passed laws to address mTBI. The majority of these states enacted legislation targeting youth sports-related concussions. In Arizona, Senate Bill 1521 states that a player must receive written clearance to resume participation in athletic activity from a health care provider which includes a physician, an athletic trainer, a nurse practitioner, or a physician assistant. In other states, like Illinois, a physician must determine if a player can return to activity and RTP. Studies in the past have

identified limitations in education and knowledge of athletic coaches and trainers regarding mTBI but there is a lack of research assessing the knowledge level of ATs on concussion management or the involvement of ATs in important return to activity or RTP decisions. Continuing education is essential in mTBI management because research is continually advancing the field. Historically, loss of consciousness (LOC) was considered a hallmark of an mTBI and a predictor of a more severe injury. Recent studies have found that retrograde and anterograde amnesia, as well as loss of consciousness, do not significantly predict post-concussion symptoms within one week following concussion. This study will establish a baseline of ATs' knowledge and involvement in return to activity and RTP decisions and determine what modes and amount of concussion education ATs have completed. This study may uncover a need for standardized education and instruction to ensure the safety of athletes if it is found that ATs are involved in return to activity or play decisions.

METHODS

A 20-question survey was developed after an extensive literature review and several discussions with concussion experts in the software Survey Monkey. The survey consisted of 6 demographic questions, 7 knowledge questions and 7 education and back to play/activity questions. The survey was sent to the email addresses of 2084 randomly selected Certified Athletic Trainers around the United States provided by the National Athletic Training Association (NATA) and was open for 36 days. A single reminder email was sent. The responses were collected and recorded anonymously in Survey Monkey. Sterling IRB classified the study as exempt. Incomplete responses and responses completed by individuals that did not identify themselves as an AT were excluded. The statistical analysis was conducted with the help of The University of Arizona statistician, Paul Kang. Survey characteristics were assessed using frequencies and proportions between participants who answered "Yes" to the primary question "Loss of consciousness is an indicator or predictor of a more serious injury" versus those who answered "No". Univariate analysis using Logistic regression assessed whether the survey questions were independently associated with the primary outcome. Variables with $p \leq 0.05$ were included into a final multivariate Logistic regression where Odds Ratios and 95% confidence intervals were reported. All p-values were 2-sided and $p < 0.05$ were considered statistically significant. All data analysis was conducted using STATA version 14 (College Station, TX).

RESULTS

Of the 2084 emails sent, 40 were unable to reach sender. A total of 428 responses were collected but 72 responses were excluded from the analysis for not being complete or individuals identified in a role other than AT. This resulted in 356 surveys and a 17.4% response rate.

Variables	Overall N=356	LOC Answered CORRECTLY (n=219)	LOC Answered INCORRECTLY (n=137)	P-trend ¹
Years of Experience (n, %)				<0.0001
0-5	82 (23.0)	34 (15.5)	48 (35.0)	
5-10	75 (21.1)	41 (18.7)	34 (24.8)	
10-15	52 (14.6)	36 (16.4)	16 (11.7)	
15-20	55 (15.5)	42 (19.2)	13 (9.5)	
>20	92 (25.8)	66 (30.1)	26 (18.9)	
What Sports are you Involved? (n, %)				
Soccer	266 (74.7)	158 (72.2)	108 (78.8)	0.15
Football	253 (71.1)	150 (68.5)	103 (75.2)	0.17
Track	240 (71.1)	145 (66.2)	95 (69.3)	0.54
Ice Hockey	66 (18.5)	44 (20.1)	22 (16.1)	0.34
Rugby	26 (7.3)	15 (6.9)	11 (8.0)	0.67
Lacrosse	121 (33.9)	73 (33.3)	48 (35.0)	0.74
Basketball	278 (78.1)	162 (73.9)	116 (84.7)	0.019
Softball	246 (69.1)	149 (68.0)	97 (90.8)	0.58
Baseball	252 (70.8)	154 (70.3)	98 (71.5)	0.80
Cheerleading	191 (53.7)	110 (50.2)	81 (59.1)	0.10
Other	152 (42.7)	97 (44.3)	55 (40.2)	0.44
What group/level of sport do you work with? (n, %)				
Club (below age 12)	19 (5.3)	12 (5.5)	7 (5.1)	0.88
Club (age 12 to 18)	36 (10.1)	24 (10.9)	12 (8.7)	0.50
Club (age 18 and older)	30 (8.4)	17 (7.8)	13 (9.5)	0.56
Middle School	65 (18.3)	40 (18.3)	25 (18.3)	0.99
High School	209 (58.7)	121 (55.3)	88 (64.2)	0.095
Community College	18 (5.1)	11 (5.0)	7 (5.1)	0.97
NCAA Division I, II or III	147 (41.3)	99 (45.2)	48 (35.0)	0.059
NAIA	10 (2.8)	7 (3.2)	3 (2.9)	0.57
In which state do you work/practice? (n, %)				0.40
Pac 10	50 (14.0)	34 (15.5)	16 (11.7)	
Big 10	139 (39.0)	91 (41.6)	48 (35.0)	
ACC	56 (15.7)	29 (13.2)	27 (19.7)	
SEC	44 (12.4)	24 (10.9)	20 (14.6)	
Big 12	24 (6.7)	11 (5.0)	13 (9.5)	
Other	43 (12.1)	30 (13.7)	13 (9.5)	

Table 1: Demographics and Question 12: Is loss of consciousness an indicator or predictor of a more serious injury? ¹P-Values calculated using univariate analysis via Logistic Regression

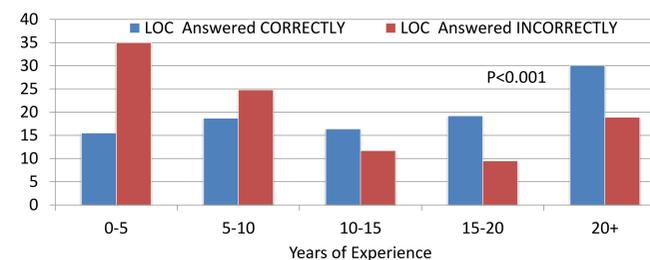


Figure 1: Is loss of consciousness an indicator or predictor of a more serious injury? stratified by years of experience. There was a statistically significant difference between the more years serving as an AT and answering that loss of consciousness is not an indicator of a more serious injury.

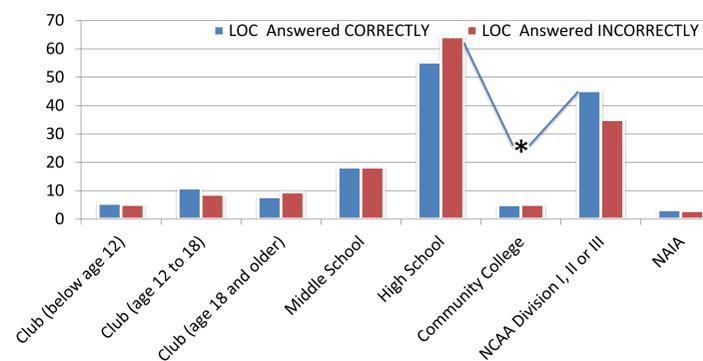


Figure 2: Is loss of consciousness an indicator or predictor of a more serious injury? Stratified group/level of sport involved with. ATs in NCAA Division I, II, and III sports were more likely to answer that LOC is not an indicator of a more serious injury while high school ATs thought LOC was an indicator of a more severe injury * statistically significant

Variables	Overall N=356 (n, %)
Approximately, How many sports related concussions do you see in one year (season)? (n, %)	
0	1 (0.28)
1-5	70 (19.7)
5-10	106 (29.8)
10-15	60 (16.9)
15-20	55 (15.5)
>20	64 (17.9)
Approximately how many concussed players do you clear back to play or activity in one year? (n, %)	
0	38 (10.7)
1-5	61 (17.1)
5-10	96 (26.9)
10-15	55 (15.5)
15-20	56 (15.7)
>20	50 (14.0)
What type of formal education or training have you had in concussion management? (n, %)	
Local conference	290 (81.5)
National conference	284 (79.8)
School district	61 (17.1)
Online	238 (66.9)
None	4 (1.1)
Other	133 (37.4)
How many hours of education regarding concussions have you completed? (n, %)	
0	22 (6.18)
1-5	60 (16.9)
5-10	50 (14.0)
10-15	35 (9.8)
15-20	189 (53.1)
>20	0 (0)
Does your profession require you to renew education about concussions? (n, %)	
No	167 (46.9)
Yes	166 (46.6)
Don't Know	23 (6.5)
Do you feel adequately trained or educated about concussions to perform your role/position? (n, %)	
No	4 (1.1)
Yes	352 (98.9)
Are you more informed than your colleagues about concussions? (n, %)	
No	64 (17.9)
Yes	162 (45.5)
Don't Know	130 (36.5)

Table 2: Back To Activity/Play and Education Results

DISCUSSION AND CONCLUSIONS

89.3% of responding ATs are clearing at least one player back to activity/RTP each year/season and 14.0% are clearing more than 20 players. It was found to be statistically significant that ATs with more years of experience and working with NCAA Division I, II, and III sports were more likely to answer that LOC is not an indicator of a more serious injury while ATs with fewer years of experience and high school ATs thought LOC was an indicator of a more severe injury. This points to experience changing attitudes about LOC rather than education. Concussion education varies widely. Many ATs indicated learning about mTBI at local and national conferences and online while many listed individual training from physicians they work with or while they were getting their degree. Our knowledge about concussions is constantly changing and without some structured and unified education it is possible some athletes may be at risk for prolonged recovery or more serious injury such as SIS. ATs are involved in important decisions and the safety of athletes needs to be a top priority. Further research and analysis is needed to ensure ATs are receiving adequate education with emphasis on return to play and activity decisions.

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