

Supporting Students After a Concussion: School Administrators' Perspectives

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Abstract

Students with a concussion may experience challenges when returning to school and completing schoolwork. Therefore, students may require temporary academic support throughout the recovery process. The purpose of this study was to examine school administrators' perceptions of the return to school process and provision of academic adjustments (AA) after concussion. Online surveys were analyzed using a series of descriptive, chi-square, and Mann Whitney tests. School administrators strongly agreed a concussion can affect school performance and were supportive of providing AA for symptomatic students. More school administrators with access to an athletic trainer and who completed concussion training had an established team to monitor concussions and reported students had received AA after concussion. To better prepare school professionals and enhance the support for students after a concussion, school administrators can develop a school-based concussion team, organize in-service training on concussion, and identify pertinent school and district-based resources to facilitate this care.

School administrators are tasked with promoting student achievement, guiding school initiatives, and establishing a productive work and learning environment (Urick & Bowers, 2014). Within the context of school accountability and considering the emphasis on student achievement (Spillane & Kenney, 2012), it is increasingly relevant for school professionals (e.g., administrators, teachers, school counselors) to be prepared to support student learning and academic performance after concussion. It is estimated nearly 1.1 to 1.9 million children and adolescents sustain concussions annually (Bryan, Rowhani-Rahbar, Comstock, & Rivara, 2016), which can occur during physical education classes (Campbell et al.,

2018), sports, and recreational activities (e.g., riding a bike, injured on a playground). Students have reported their concussion symptoms, such as a headache, difficulty concentrating, fatigue, and irritability, interfere with their ability to attend school (Rozbacher, Selci, Leiter, Ellis, & Russell, 2017), stay engaged in class, and complete coursework (Makki et al., 2016; Ransom et al., 2015; Thompson et al., 2018).

Physical and cognitive rest were once considered the cornerstone of concussion management (McCrary et al., 2017); however, complete rest and school absence for multiple days have not been associated with improved outcomes (Arbogast et al.,

2013; Gibson, Nigrovic, O'Brien, & Meehan, 2013) and may actually lengthen symptom duration in adolescents (Thomas, Apps, Hoffmann, McCrea, & Hammeke, 2015). Because learning is a major component of childhood and adolescent life, it is medically and academically impractical for a student with concussion to not attend school until fully recovered. Therefore, experts recommend gradually returning to activity as tolerated and temporarily accommodating symptomatic students so they can attend school (Lumba-Brown et al., 2018). This process is modelled after established procedures for students with long-lasting conditions, such as traumatic brain injury (McAvoy, Eagan-Johnson, & Halstead, 2018), and only more recently has been applied to concussion. Although most students will recover 2–4 weeks after a concussion (Purcell, Harvey, & Seabrook, 2016; Thomas et al., 2018) and will not require long-term assistance (e.g., Individualized Education Program [IEP], Section 504 plan), different symptoms and recovery trajectories make it challenging for school professionals to anticipate the support each student may need.

A section of the guidelines from the Centers for Disease Control and Prevention for the management of pediatric and adolescent mild traumatic brain injury, which includes concussion, is dedicated to the student's return to school (Lumba-Brown et al., 2018). To determine the necessary academic support strategies, or academic adjustments (AA) and to monitor the student's recovery, these experts recommend the use of a school-based concussion team. Although school-based teams are ideally suited to determine informal and temporary AA in a timely manner, little is known regarding school administrators' perceptions of AA and preparation to manage a concussion. In a study of school principals in

Indiana, the majority had not received formal training on concussion management and were only somewhat comfortable with aiding in a student's return to school (Janson, Nittoli, White, & Tekulve, 2018). Principals in Ohio reported that the school nurse, athletic trainer, and guidance counselor were often involved with monitoring a student's recovery and communicating with stakeholders (Heyer, Weber, Rose, Perkins, & Schmittauer, 2015).

Because school administrators have the ability to influence school climate and policies (Bredeson & Kose, 2007; Sebastian, Allensworth, & Huang, 2016; Spillane, Reiser, & Reimer, 2002), such as a concussion policy, and because of their interactions with other school professionals during the management of concussion, we explored school administrators' perceptions of adolescent concussion and their experiences regarding a student's return to school. Our research questions included the following:

1. What are school administrators' (superintendents and principals) perceptions of concussion and the return to school process?
2. Is access (or no access) to an athletic trainer associated with their perceptions of concussions?
3. Is completion (or no completion) of formal concussion education associated with their perceptions of concussions?

We hypothesized school administrators would agree concussions affect school performance and would report moderate familiarity with AA. We also hypothesized that access to an athletic trainer and completion of concussion education would be associated with greater familiarity with AA and greater likelihood of these strategies being implemented within schools.

Theoretical Framework and Literature Review

Leadership in Schools

Previous descriptions of school leadership models were grounded in the technical-rational model, where authoritative, hierarchical figures are viewed as leaders of a group or organization (Jackson & Marriott, 2012). Traditionally, superintendents were tasked with guiding the curriculum and instruction in schools (Urick & Bowers, 2014), but their roles have evolved to include data-driven analysis of curricular and assessment practices, accountability for the budget, political matters, and personnel issues (Bredeson & Kose, 2007). Principals were previously designated as leaders of their teachers' pedagogical development, but the current emphasis on educational standards and school accountability have changed the dynamics of their daily practices and interactions with teachers (Marks & Printy, 2003; Sebastian et al., 2016). Therefore, to promote student success and empower teachers, many school principals embody a shared instructional or transformative approach to leadership that includes teachers in decision-making for the school and fosters a positive work environment (Hallinger, 2003; Urick & Bowers, 2014).

Over time, educational leadership theory has shifted to a more distributed model, where individuals are bolstered by their knowledge or expertise to meet targeted goals and address school needs (Jackson & Marriott, 2012; Spillane, 2005). As such, teamwork is emphasized over formal leadership labels or roles, and recommendations for a school-based concussion management team aligns with a distributed leadership model. School counselors, teachers, administrators, school

nurses, and athletic trainers are often included in the school-based concussion team because of their knowledge of best practices and desire to support the student throughout the concussion management process (Halstead et al., 2013; Heyer et al., 2015).

Reciprocal interdependency within the team occurs through reliance on the healthcare professional on campus (e.g., school nurse, athletic trainer) providing updates on the student's physical recovery and ongoing symptoms. Additionally, teachers and school counselors provide meaningful observations about the student's behavior and academic progress. While administrators may generally be involved in communication with stakeholders, team members collectively determine the AA needed and eventually eliminate these supports as the student recovers (Purcell, Davis, & Gioia, 2019).

Concussion team members can be viewed as implementation agents of a concussion policy, which is part of leadership practices in schools (Spillane, Halverson, & Diamond, 2001). Successful policy implementation requires individuals to reflect on how their knowledge and beliefs may affect their interpretation of the policy and subsequent actions (Spillane et al., 2002). Understanding and making sense of the policy's purpose are more important than the simple decision to enact the policy. For example, the extent to which an individual believes a concussion affects academic performance can influence the policy developed and strategies implemented for students. Individuals who recognize how concussion symptoms affect learning will likely develop a robust concussion policy and maximize the team's expertise and resources to support a symptomatic student. Conversely, individuals who question the effects of concussion on a student may resist

developing a policy or may provide minimal support to a symptomatic student.

School Administrators and Concussion Management

Although school administrators may indirectly interact with students after a concussion, familiarity with the school's concussion management practices and current cases of struggling students is necessary when communicating with the student's family and school professionals. In Indiana, 65% of principals were notified when there were more than five concussions during the previous academic year (Janson et al., 2018). In Canada, 56% of principals had a formal process to track students after concussion and identified the principal, vice principal, and physical health education teacher for this purpose (Hachem, Kourtis, Mylabathula, & Tator, 2016). However, only one-third of principals in Ohio had completed a concussion education program (Heyer et al., 2015), which may affect their performance in the concussion team and their support of AA. Although some academic support after a concussion is provided in schools, many principals have expressed a desire for more specific concussion management guidelines and a need for all school employees to complete concussion training (Hachem et al., 2016; Heyer et al., 2015).

School-wide training on concussions can facilitate temporary and informal AA to limit symptom exacerbation and allow students to think, learn, and function in school to the best of their ability (McAvoy et al., 2018). Students have reported rest time, delayed due dates, and a gradual return to school as the most helpful strategies while they recovered from a concussion (Russell, Selci, Chu, Rozbacher, & Ellis, 2017). This student-centered approach prioritizes

academic progression and wellbeing and may decrease the school's liability from inadequately managed concussions, which have already resulted in large settlements across the United States (Kelman & John, 2018; Van Osdol, 2014). Therefore, school administrators should work alongside school professionals to establish a concussion policy, monitor student recovery, and communicate with the student's family to ensure student success and mitigate legal risk (Gioia, 2016; Hossler, McAvoy, Rossen, Schoessler, & Thompson, 2014).

All states and the District of Columbia in the United States have legislation regarding concussion and the return to sport, but few state statutes include return to school considerations (Lowrey, 2015; Thompson et al., 2016). Among those states with such legislation, the language is broad and does not discuss how to implement AA or the return to school process (O'Neill et al., 2017). Teachers, school nurses, and school counselors have reported moderate familiarity with AA (Johnson, Kasamatsu, Valovich McLeod, Register-Mihalik, & Welch Bacon, 2018; Kasamatsu, Valovich McLeod, Register-Mihalik, & Welch Bacon, 2017; Weber, Welch, Parsons, & McLeod, 2015); however, misconceptions about brain injuries among educators exist (Ettel, Glang, Todis, & Davies, 2016; Linden, Braidon, & Miller, 2013). Teachers with general education classes had more misconceptions about traumatic brain injury than teachers with special education classes (Ettel et al., 2016), which could affect the ability to identify a student in need or implement AA. For example, many educators did not associate previous brain injury with current academic performance (Hawley, Ward, Magnay, & Mychalkiw, 2004), and others attributed decreased performance to a lack of effort (Linden et al., 2013). Misconceptions and the invisibility of concussion have been

reported as barriers to teacher implementation of AA (Lyons et al., 2017), and many have requested more training on concussion (Dreer, Crowley, Cash, O'Neill, & Cox, 2017).

Comprehensive models that emphasize school-based concussion management, such as Remove/Reduce, Educate, Adjust/Accommodate, Pace (REAP), BrainSTEPS (Strategies Teaching Educators, Parents, and Students), and Brain 101, are publicly available and are already in use across the country. Schools that used the Brain 101 concussion module provided AA more often and were more likely to create a concussion management team to monitor the student's recovery than schools that did not use this resource (Glang et al., 2015). Once school professionals identify team members and a model that works for their site, school administrators can support the team by recognizing and valuing the team's work (Taplin, Foster, & Shortell, 2013). Providing a time and space for school-wide concussion training is also essential for establishing clear guidelines that promote teamwork and enhance support for symptomatic students (Gioia, 2016; Hossler et al., 2014; Lyons et al., 2017). Therefore, to better understand school administrators' beliefs and management practices as they relate to concussion, we investigated school administrators' perceptions of concussion, academic support strategies, and individuals involved in managing concussion in schools.

Methods

Participants

A total of 660 of 770 school administrators accessed the survey (85.7% access rate), and 516 completed surveys were analyzed (78.2% completion rate). There were five respondents who indicated that they were not currently serving as a principal or superintendent

and were excluded from the sample prior to analysis. Participants were mostly male (74.4%, 384/516) from 30 different states, were aged 52.3 ± 7.6 years, and had 8.1 ± 6.1 years of experience as a school administrator. Additional participant characteristics are displayed in Table 1.

Table 1

<i>Participant and School Characteristics</i>		
Variable	<i>n</i>	%
Role		
Superintendent	304	58.9
Principal	212	41.1
Years of school administrator experience		
0–2 years	93	18.0
3–5 years	125	24.2
6–10 years	139	26.9
11–15 years	90	17.4
16–20 years	34	6.6
21+ years	23	4.5
Missing	12	2.3
Highest education level		
Bachelor's degree	13	2.5
Master's degree	354	68.6
Doctorate degree (e.g., PhD, EdD)	143	27.7
Clinical doctorate degree (e.g., DNP)	2	0.4
Missing	4	0.8
Type of school		
Public school	487	94.4
Public charter school	15	2.9
Private parochial school	1	0.2
Boarding school	1	0.2
Other	3	0.6
Missing	9	1.7
Level of school ^a		
Preschool	252	38.2
Elementary	292	44.2
Middle school	258	39.1
Junior high	192	29.1
High school	284	43
Other ^b	22	3.3

Note. PhD = doctor of philosophy; EdD = doctor of education; DNP = doctor of nursing practice. ^aParticipants were able to select more than one response; therefore, percentages do not add to 100%. ^bOther refers to alternative education or a different combination of school levels.

Instrument

A previously validated survey, The Beliefs, Attitudes, and Knowledge Following Pediatric Athlete Concussions (BAKPAC), was originally developed for athletic trainers (Williams, Welch, Parsons, & Valovich McLeod, 2015) and other healthcare professionals (Weber et al., 2015). We modified this instrument to tailor it for school principals (BAKPAC-PR) and superintendents (BAKPAC-SP). The term sport-related concussion was used in this instrument for consistency of language with other studies using the BAKPAC survey and because our research questions were driven by the sport-related concussion literature. Two principals and one superintendent piloted the surveys before dissemination. Based on pilot feedback, six changes were made to the instrument for principals and nine changes were made to the instrument for superintendents. These changes were minor, and the majority of the survey content for both versions remained the same. Thus, for the purposes of the current study, the results of these groups were merged to present findings of school administrators collectively.

The survey contained five sections: concussion knowledge, collaboration, established relationships with healthcare providers, perceptions of academic adjustments, and demographics. Because we had to include specific follow-up questions based on previous responses, there was a range of 34 to 44 items. The current study focuses on the perceptions of academic adjustments section of the survey, which contained multipart, four-point Likert-scale, and closed-ended items. Likert-scale items asked about school administrators' level of agreement (1 = *strongly disagree*, 4 = *strongly agree*) and familiarity (1 = *not familiar at all*, 4 = *extremely familiar*) with

concussion and management strategies in schools. Closed-ended items asked about establishment of an academic team to manage concussions and experiences with implementation of AA or declines in a student's academics after concussion.

Procedures

A list of randomly selected principals' and superintendents' e-mail addresses from across the United States was purchased through a third-party company. An e-mail invitation was created requesting the school administrators' participation in the study. It contained the purpose of the study, contact information for the project leader (CEWB), estimated time to complete the survey, and a hyperlink to the online survey (Qualtrics, Provo, UT). Institutional review board approval was obtained before the survey was distributed, and consent was implied if the school administrator completed the survey. The survey was open for a four-week period, and one reminder e-mail was sent at the two-week mark. Participants were allowed to skip questions without penalty; therefore, total responses for each item are provided.

Data Analysis

Descriptive statistics (i.e., frequency, percentage, mean, standard deviations) were calculated for survey items. Dependent variables were school administrators' responses to items regarding perceptions of concussion and academic support strategies. Independent variables included access to an athletic trainer (yes, no) and concussion education (yes, no). Nonparametric testing was deemed appropriate for the non-normally distributed responses. Thus, Mann-Whitney tests were used to assess group differences of rank order items (i.e., perceptions of concussion, familiarity with academic

support strategies). Chi-square tests were used to assess differences in categorical items (i.e., establishment of an academic team, whether a student received AA, encounter with an academic decline after concussion). Continuity correction for chi-square tests was applied for 2×2 tables, and effect sizes are presented as Φ for 2×2 tables and as Cramer's V for larger tables (.1 = small, .3 = medium, .5 = large). Standard statistical software (SPSS version 26, IBM Corporation, Armonk, NY) was used for all statistical analyses with the level of significance set a priori at .05.

Results

Concussion and Academic Support Provided in Schools

Overall, school administrators strongly agreed a concussion can affect school performance ($M = 3.8/4.0 \pm 0.43$) and agreed a student with concussion is eligible for special considerations under the Americans with Disabilities Act (ADA) ($M = 3.2/4.0 \pm 0.76$). School administrators strongly disagreed there was too much attention and focus on concussion in sports ($M = 1.6/4.0 \pm 0.66$). Regarding academic support strategies for students, school administrators were moderately familiar with AA ($M = 3.3/4.0 \pm .89$) and extremely familiar with IEPs ($M = 3.8/4.0 \pm 0.41$) and Section 504 plans ($M = 3.7/4.0 \pm 0.52$). For a question specific to superintendents, 79.7% ($n = 240/301$) reported that a district-wide concussion policy had been established, and 20.3% ($n = 61/301$) reported that a district-wide concussion policy had not been established. Figure 1 illustrates the frequencies of topics that superintendents reported were included in an established district-wide concussion policy.

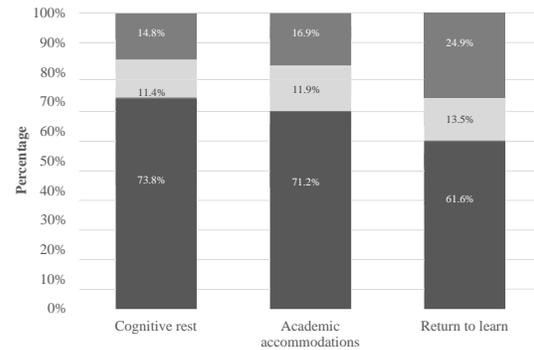


Figure 1. Distribution of superintendent's responses regarding topics included or not included in the school district's concussion policy.

In our study, 45.9% ($n = 237/514$) of school administrators reported there was an established academic team to assist with the management of concussion, but 47.3% ($n = 244/514$) reported not having an established team and 6.4% ($n = 33/514$) were unsure if a team had been established. Individuals involved with established concussion management teams are illustrated in Figure 2. When asked whether the school/district should have an established academic support team for concussion, 43.8% ($n = 120/274$) of school administrators believed an academic support team was necessary, 25.5% ($n = 70/274$) did not believe a team was necessary, and 30.7% ($n = 84/274$) were unsure. When they were concerned about the academic progression of a student after a concussion, school administrators reported they would most likely contact the directing or family physician (87.6%, $n = 452/516$), parent (64.7%, $n = 334/516$), school nurse (62.4%, $n = 322/516$), school counselor (62.4%, $n = 322/516$), or teacher (58.3%, $n = 310/516$). The principal (50.2%, $n = 259/516$), athletic director (43.4%, $n = 224/516$), athletic trainer (42.2%, $n = 218/516$), coach (41.7%, $n = 215/516$), or other school administrator outside of the athletics department (18.8%, $n = 97/516$) were reported less frequently as the

contact person when the administrator was concerned about a student's performance.

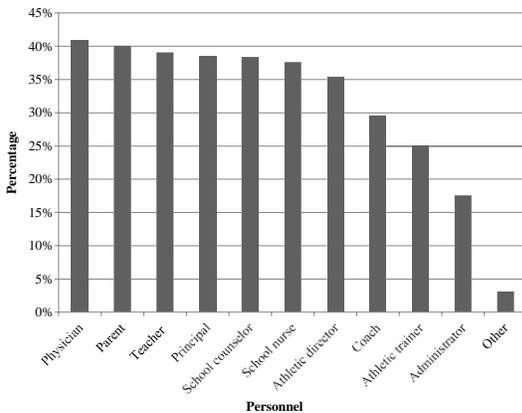


Figure 2. Individuals involved in a school's concussion management teams. Physician refers to the team/directing physician or family doctor. Administrator refers to a school administrator outside of the athletics department.

In practice, 63.5% ($n = 325/512$) of school administrators reported that a student had received AA after a concussion, but 16.2% ($n = 83/512$) stated AA was not provided and 20.3% ($n = 104/512$) were unsure. Principals reported they often recommended AA to parents and the student after concussion (51%–75% of the time, $M = 3.0/6.0 \pm 1.75$). Superintendents reported rarely communicating with parents or students after concussion (1%–25% of the time, $M = 4.5/6.0 \pm 1.22$). The individuals most commonly designated as the point person to manage AA and communicate with stakeholders were the school counselor (29.8%, $n = 97/326$) and principal (32.8%, $n = 107/326$).

Access to an Athletic Trainer

Many school administrators reported that their student-athletes had access to an athletic trainer (67.2%, $n = 347/516$), and fewer reported that their students were unable

to access an athletic trainer (31.0%, $n = 160/516$) or were unsure (1.6%, $n = 8/516$). No group differences were observed for administrators' perceptions of a concussion affecting school performance ($p = .86$), eligibility under ADA ($p = .86$), or attention to concussion in sports ($p = .43$). To assess items related to support strategies during the return to school after concussion, separate chi-square tests were conducted; no cells violated the minimum expected cell counts. More school administrators with access to an athletic trainer reported they had an academic team established than those without access to an athletic trainer (53.2% vs. 31.3%), $\chi^2 (2, n = 506) = 29.1, p < .001$, Cramer's $V = .24$. When compared with those without access to an athletic trainer, access to an athletic trainer was associated with more reports that a student had received AA after concussion (68.6% vs. 53.8%), $\chi^2 (2, n = 506) = 18.1, p < .001$, Cramer's $V = .19$, and that a school administrator had personally encountered a student who experienced an academic decline after concussion (62.4% vs. 47.8%), $\chi^2 (1, n = 505) = 9.6, p = .003, \Phi = .14$. In a question posed to superintendents only, no differences were observed in their reports of having a district-wide concussion policy established for those with or without access to an athletic trainer ($p = .11$). Table 2 displays the group distributions (access or no access to an athletic trainer) of school administrators' responses regarding academic support strategies and whether a student experienced an academic decline after concussion.

Formal Concussion Education

Sixty-one percent ($n = 316/513$) of school administrators had completed formal concussion education, and 38.2% ($n = 197/513$) had not. This training was often associated with state or organizational programs (e.g., National Federation of State High School Associations, Centers for

Table 2

Group Differences in Academic Support Strategies and Experiences of School Administrators

Variable	Athletic trainer access			Concussion education		
	Yes	No	Effect size	Yes	No	Effect size
Established team (yes)	53.2%	31.3%		54.9%	32.1%	
Established team (no)	39.3%	65.0%	0.24*	41.9%	56.6%	0.25*
Established team (I do not know)	7.5%	3.8%		3.2%	11.2%	
Student received AA (yes)	68.6%	53.8%		70.7%	51.5%	
Student received AA (no)	11.6%	26.3%	0.14*	14.6%	18.9%	0.14*
Student received AA (I do not know)	19.8%	20.0%		14.6%	29.6%	
Encountered academic decline (yes)	62.4%	47.8%		62.7%	48.5%	
Encountered academic decline (no)	37.6%	52.2%	0.19*	37.3%	51.5%	0.21*
Established district-wide policy (yes)	82.7%	73.9%		84.9%	71.6%	
Established district-wide policy (no)	17.3%	26.1%	0.10	15.1%	28.4%	0.16*

Note. AA = academic adjustments. Distributions of responses for select variables are organized within each column by group (access or no access to an athletic trainer, completion or no completion of concussion education). Percentages are rounded and may not add to 100%. Effect size was defined as .1 = small, .3 = medium, .5 = large. * $p < .05$. ** $p < .001$.

Disease Control and Prevention, state-sponsored governing body) using an online webinar or in-person workshop format. School administrators who were formally educated about concussion were more familiar with AA ($M = 3.4/4.0 \pm 0.77$) than those without formal concussion training ($M = 3.1/4.0 \pm 1.0$, $p < .001$). No group differences were observed regarding perceptions of concussions affecting school performance ($p = .11$), eligibility under ADA ($p = .06$), or attention to concussion in sports ($p = .86$). More school administrators with formal concussion training reported that an academic team was established on campus, $\chi^2(2, n = 511) = 31.6$, $p < .001$, Cramer's $V = .25$; that a student had received AA, $\chi^2(2, n = 510) = 21.5$, $p < .001$, Cramer's $V = .21$; and that the school administrator had encountered a student who experienced an academic

decline after concussion, $\chi^2(1, n = 510) = 10.0$, $p = .002$, $\Phi = .14$. In a question posed to superintendents only, more superintendents with concussion training had an established district concussion policy than those who had not completed formal concussion education (84.9% vs. 71.6%), $\chi^2(1, n = 301) = 7.0$, $p = .008$. Group distributions (concussion education completed or not completed) of school administrators' responses regarding academic support strategies and whether a student experienced an academic decline after concussion are also included in Table 2.

Discussion

The purpose of the current study was to explore school administrators' perceptions of concussion, academic support strategies,

and individuals involved in managing concussion in schools. School administrators strongly agreed a concussion can affect school performance and were moderately familiar with AA. This familiarity is not surprising since the underlying principles of AA are based on support strategies already in place in schools (e.g., IEPs, Section 504 plans). These strategies, such as planning periodic rest breaks or assigning a temporary notetaker, allow the student to participate as tolerated instead of staying at home or needing to leave school from exacerbated symptoms. School nurses (Weber et al., 2015), school counselors (Johnson et al., 2018), and teachers (Kasamatsu et al., 2017) reported similar perceptions of concussion and AA, which can aid school-wide collaboration and contribute to distributed leadership while supporting a student's return to school. However, Romm et al. (2018) found school administrators perceived AA implementation to be much simpler than teachers, largely because of class size, classroom environment, and the time required for teachers to determine which AA were most applicable.

Approximately half of school administrators in the current study reported that an academic team had been established to manage concussions in schools. Interestingly, teachers and school counselors in related studies (Johnson et al., 2018; Kasamatsu et al., 2017) reported different accounts about the establishment of an academic team. Only 27% of teachers (Kasamatsu et al., 2017) and half of school counselors (Johnson et al., 2018) reported that their school had an established academic team. It is unclear why this discrepancy exists, but it is possible teachers and counselors were less aware of an established team because they did not interact with a student who needed these services. Team-based approaches, such as a Student Success

Team, can facilitate individualized support for a student in a timely manner without requiring the formalized process associated with an IEP or Section 504 plan (Halstead et al., 2013; McAvoy et al., 2018). As inclusion of AA becomes commonplace in the management of concussion, having an established team can streamline communication for parents (Lyons et al., 2017), prevent a decline in grades from missed or late assessments (Hawley et al., 2004; Rozbacher et al., 2017; Wasserman, Bazarian, Mapstone, Block, & van Wijngaarden, 2016), and provide timely assistance to students.

Access to an Athletic Trainer

Approximately 67% of school administrators in the current study reported having a part-time or full-time athletic trainer at their school, which is similar to reports by Pryor et al. (2015). Although athletic directors and principals have reported relying on coaches or emergency medical technicians when an athletic trainer is not present (Vandermark, Pryor, Pike, Mazerolle, & Casa, 2017), athletic trainers are commonly employed in schools to provide immediate care for sport-related injuries, but they also communicate with parents and activate a care plan after concussion. In the current study, school administrators with access to an athletic trainer were more likely to report that they had an established academic team and that AA had been provided to students, which support previous reports (Heyer et al., 2015). It is plausible that these findings indicate athletic trainers are already collaborating with school professionals or are actively contributing to the development of a concussion policy or concussion team. An athletic trainer's follow-up exam may also identify a student's areas of need or functional deficits that the concussion team can utilize to determine whether changes to

AA are necessary or when elimination of AA is possible. School administrators without access to an athletic trainer should seek assistance from a school nurse or pursue a community partnership with healthcare professionals to aid in concussion management and support the student's gradual return to school (Gioia, Glang, Hooper, & Brown, 2016).

Formal Concussion Education

Nearly two-thirds of school administrators had completed formal concussion education, which was double previous reports of principals with concussion training (Heyer et al., 2015; Janson et al., 2018). The reported increase in concussion training may be indicative of concussion awareness efforts throughout the United States and suggests school professionals are actively increasing their knowledge of concussion. School administrators in the current study who completed concussion education were more likely to report the school had an academic team and a district concussion policy established than their counterparts. It is possible that the administrators' positive perspective of concussion may have influenced their willingness to support a concussion policy (Spillane et al., 2002) or that participation in concussion training prepared them to implement best practices. Organizing concussion trainings and strategizing professional learning communities to provide school professionals with pertinent resources can increase school-wide support and policy implementation. Interprofessional education among school professionals is needed to discuss concussion protocols, equip teachers with relevant strategies, and address possible challenges teachers may experience while implementing AA (Howland et al., 2018; Lyons et al., 2017; Romm et al., 2018). Collective efforts can

increase stakeholder buy-in and facilitate a smooth return to school for students after concussion (Gioia et al., 2016; Hossler et al., 2014).

Limitations and Future Directions

As with any survey research, response rate and accurate self-reporting should be considered before generalizing these findings. Although the response rate was lower than desired, it was consistent with response rates of other survey studies using a personalized e-mail approach for participant recruitment (Sinclair, O'Toole, Malawaraarachchi, & Leder, 2012).

Because the contact information of school administrators was obtained through a third-party company, it did not account for true representativeness of all school administrators randomly sampled. Readers should reference our school administrators' demographics before generalizing results. Additionally, our findings are based on self-assessment of school administrators' perceptions and experiences, which were not confirmed for accuracy. To reduce this potential limitation, we encouraged honesty through anonymous reporting and the ability to skip questions. Although we did not ask if school administrators provided AA to the entire student population, not just student-athletes, our findings indicate that support systems already exist in some schools and could be activated for any student after concussion. We believed it was important to report these findings to encourage dialogue on campuses and across school districts about the monitoring and care of all students after concussion.

To continue to enhance the care provided to students after concussion, future researchers should investigate the effectiveness of specific concussion

education programs and factors that affect the implementation of AA in schools. Additional research areas may include, but are not limited to, comparing efficacy of different mediums for concussion education, exploring the frequency of AA provided, determining confidence with implementation of AA, and assessing family and student perceptions of the concussion management process. As such, findings may aid school administrators in promoting a supportive school environment, improving student outcomes after concussion, and contributing to best practices for concussion management in schools.

Conclusion

In the current study, school administrators acknowledged the effect a concussion can have on a student's learning. Many school administrators reported that they were familiar with AA to support students after concussion and that AA had been provided to symptomatic students. Developing a framework to appropriately monitor a student's recovery after concussion can enhance the support provided to students and limit legal repercussions from an improperly managed concussion. Nearly half of school administrators reported having an established academic team to monitor the student's return to school, and they identified the diagnosing physician, school nurse, parents, and school counselor as other important members of this team. These findings indicate some schools are using a distributed leadership approach to manage concussions in schools and are already implementing academic support strategies for students after a concussion. Open dialogue with the school nurse, athletic trainer, and other school professionals with task-relevant knowledge can enhance the concussion management team's facilitation

of AA and ongoing support of students after concussion.

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