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Athletic Administrators Report of Emergency Action Plan Adoption in Secondary School Athletics: The Influence of Athletic Training Services

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Abstract

This study describes the emergency action plan (EAP) adoption in secondary school athletics reported by athletic administrators in the United States. Utilizing best-practice criteria, a questionnaire assessed athletic administrators' knowledge and adoption of an EAP in their athletics program. A majority of athletic administrators reported having an EAP; however, the EAP often lacked the necessary components to be compliant with best-practice guidelines. Further, access to an athletic trainer was associated with increased EAP adoption and adopting a venue specific EAP. Athletic administrators should utilize these data to facilitate improved policy adoption and management of athletics programs.

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Introduction

Nearly 8 million athletes participating in secondary school sports are susceptible to potentially catastrophic or fatal injury (National Federation of State High School Associations., 2015). The outcomes of these injuries may be improved if safety best practices, such as emergency action plans, are in place (Andersen, Courson, Kleiner, & McLoda, 2002a; Casa et al., 2012; Drezner, Rao, Heistand, Bloomingdale, & Harmon, 2009). Similar to emergency operations plans (e.g., fire drills, bomb threat drills, etc.) during the school day, athletics emergency action plans (EAP) are written procedures detailing responses to medical emergencies that may mitigate the risk of a fatality or long-term disability. Athletic administrators are in a unique position to influence sport safety by overseeing the athletics department, and thus are in a position to decide if, and what, policies are implemented.

Sport-related EAPs form a framework of procedures to be initiated when a medical emergency occurs during sports injury participation. Optimal preparation and execution of an EAP requires full buy-in from athletics department personnel, including athletic administrators, coaches and care providers. An EAP, as outlined in the National Athletic Trainers Association Position Statement: Emergency Planning in Athletics, requires a team to effectively create, implement, and rehearse the planned response across the variety of venues and practices of the athletics program (Andersen et al., 2002). Data from athletic directors employed at secondary schools suggest that 53-75% of secondary schools are adopting an athletics-specific EAP (Harer & Yaeger, 2014; Lear, Hoang, & Zyzanski, 2015; Monroe, Rosenbaum, & Davis, 2009; Wasilko & Lisle, 2013). However, despite published best practice recommendations for implementation of an EAP, there is little evidence demonstrating that these EAPs are comprehensive and include all recommended components of EAPs as stated in the NATA position statement.

Although current data provide promise that a majority of secondary schools are adopting an EAP (Harer & Yaeger, 2014; Lear et al., 2015; Monroe et al., 2009; Wasilko & Lisle, 2013), additional research is needed to determine the comprehensiveness of these plans. To date, there is no published document to outline athletic administrators' perspectives on the extent of secondary school EAP adoption of all recommendations in the NATA Position Statement. Therefore, our primary purpose was to investigate the current adoption of the recommended components in EAPs from the "NATA Position Statement: Emergency Planning in Athletics" through a national survey of athletic administrators at the secondary athletics level (Andersen, Courson, Kleiner, & McLoda, 2002a). Secondarily, we sought to identify if access to an AT influences the adoption of a comprehensive EAP.

Methods

Research Design

Survey data were collected from a national sample of secondary school athletics administrators to assess current adoption of emergency preparedness. The University of Connecticut Institutional Review Board approved this study as “exempt.”

Participants

Athletic administrators (AAs) employed in secondary schools across the nation were invited to participate in this survey. E-mail addresses of AA were compiled from publicly accessible school websites. In May 2017, e-mail invitations were sent to 9,687 secondary school AAs inviting them to complete a web-based survey (Qualtrics, LLC, Provo, UT) on their school’s emergency planning for athletics. Two follow-up invitations were sent one and three weeks after the initial distribution.

A total of 829 surveys were started in the Qualtrics system. Incomplete surveys (<20% of questions complete) were removed, yielding 702 surveys from AAs, for a response rate of 7.2%. The completion rate for this survey was 82.9%. Given a primary aim of this investigation was to evaluate the current adoption of an EAP in the secondary school setting, we aimed to identify the sample size of respondents who completed the question “Does your school have a written emergency action plan for athletics?” A total of 671 respondents answered the question “Does your school have a written emergency action plan for athletics” yielding a true response rate of 6.9%.

Survey Design

The questionnaire was created by members of the research team to assess overall EAP adoption that included the components outlined in the NATA Position Statement: Emergency Planning in Athletics (Andersen et al. 2002; Casa et al., 2013). The twelve components from this document are outlined in Table 1.

Survey Validation

Validation efforts included internal, external and expert content validity. Experts in the field of preventing sudden death in sport across domain areas of cardiac, exertional heat stroke, traumatic brain injury, and cervical spine injury were consulted for feedback on the clarity, relevance and importance of the questions. Following content validation, a pilot study with 30 AAs was conducted. Survey validation concluded with phone interviews of 10 participants from the pilot participants with the aim of better understanding of gaps in the survey to allow for revisions to question wording based off the findings.

Data Analyses

EAP policy adoption responses were summarized descriptively by frequency and percentage for characteristics measured discretely, and by mean and stan-

Table 1
Athletic Administrators' Report of EAP Adoption in Secondary Schools

Yes, my school...	Overall	Yes AT	No AT
1. Has a written emergency action plan for managing serious and/or potentially life-threatening sport-related injuries.	75.7% (508/671) [72.4-78.9]	79.5% (392/493)* [75.7-83.0]	64.4% (112/174) [57.3-71.5]
2. Develops and coordinate the EAP with local EMS, school public safety officials, on-site medical personnel or school medical staff, and school administrators	84.6% (396/468) [81.0-87.8]	85.3% (308/361) [81.2-88.8]	81.6% (84/103) [72.7-88.5]
3. Distributes and review the EAP to all relevant athletics staff members annually.	83.4% (387/464) [79.7-86.7]	84.0% (300/357) [79.8-87.7]	80.6% (83/103) [71.6-87.7]
4. Rehearses the EAP annually with AT, AD, coaches and other pertinent medical personnel.	51.8% (239/461) [47.2-56.5]	50.3% (179/356) [45.0-55.6]	56.4% (57/101) [46.2-66.3]
5. Updates the EAP annually by all relevant athletics staff members.	79.4% (367/462) [75.5-83.0]	81.5% (290/356) [77.0-85.4]	71.6% (73/102) [61.8-80.1]
6. Identifies personnel and their responsibilities to carry out the plan of action with a designated chain of command.	89.3% (419/469) [86.2-92.0]	90.0% (325/361) [86.5-92.9]	86.5% (90/104) [78.4-92.4]
7. Identifies location of on-site emergency equipment.	95.5% (449/470) [93.3-97.2]	95.6% (346/362) [92.9-97.5]	95.2% (99/104) [89.1-98.4]
8. Lists contact information for EMS and other key personnel, as well as facility address, location on the EAP.	91.5% (428/468) [88.5-93.8]	91.4% (330/361) [88.0-94.1]	91.3% (94/103) [84.1-95.9]
9. Provides recommendations for documentation that should be taken after a catastrophic injury.	75.8% (354/467) [71.7-79.6]	74.7% (268/359) [67.8-77.1]	78.8% (82/104) [69.7-86.2]
10. Includes information for healthcare professionals providing medical coverage included in the review and rehearsal of the plan.	63.7% (297/466) [59.2-68.1]	63.8% (229/359) [56.9-67.0]	63.1% (65/103) [53.0-72.4]
11. Has a venue specific EAP.	74% (341/461) [69.7-77.9]	77.4% (274/354)* [72.7-81.7]	61.2% (63/103) [51.1-70.6]
12. Posts the EAP at every venue.	35.3% (162/459) [30.9-39.9]	35.2% (124/352) [30.2-40.5]	35% (36/103) [25.8-45.0]

Overall (all AA responses compiled). Yes AT (report access to at least 1 athletic trainer). No AT (report not having access to an athletic trainer). Compared to schools without access to an athletic trainer, access to an athletic trainer was associated with EAP adoption ($\chi^2=15.97, p<.001, OR=2.14(1.46, 3.14)$), and having a venue-specific EAP ($\chi^2=10.86, p<.001, OR=2.17(1.36, 3.47)$).

*denotes significance

dard deviation for characteristics measured on a continuous scale. To estimate the probability that a characteristic occurs within the secondary school setting, 95% confidence intervals for proportions were calculated. EAP adoption and EAP components were analyzed separately and were also dichotomized into two categories based on the number of components adopted. Athletic trainer (AT) access was determined by a question stating “How many athletic trainers does your school have access to?” If the AA did not have access to an athletic trainer at their school, they were asked to mark “0.” EAP components with access to an athletic trainer were analyzed with 2x2 contingency tables using Chi Square tests of association, and calculations of odds ratios with 95% confidence intervals. Operational definitions of variables are provided in Table 2. Adoption was operationally defined as participants reporting they have a written policy. Analyses were performed in SPSS version 24 with a significance level of 0.05.

Table 2

Operational Definition of Variables

Categories of Emergency Action Plan (EAP) Adoption	
EAP Adoption	Any response delineating their school has an EAP in general
EAP components (“High Adoption” vs “Low Adoption”)	Sum of respondents’ adoption of EAP components (total possible=12). Dichotomized into 2 groups: ≥ 9 components (High Adoption) and ≤ 8 components (Low Adoption)

Results

Overall, 75.5% (508/671) of AAs reported adopting an EAP in their secondary school. The component with the highest adoption is “the plan identifies location of on-site emergency equipment” with 95.5% (449/470) of AA reporting adopting this. The component with the lowest adoption was “the EAP is posted at every venue” with 35.3% adoption (Table 2). Thirteen percent of AAs reported adoption of 12/12 components (Figure 1).

Access to AT Services

Over a quarter (26.1%, 95% CI: 22.8, 29.6%) of schools did not have access to an AT. AT accessibility was associated with EAP adoption ($\chi^2=15.97$, $p<.001$, OR=2.14(1.46, 3.14)), and having a venue-specific EAP ($\chi^2=10.86$, $p<.001$, OR=2.17 (1.36, 3.47)) (Table 1). When separating the components of EAP adoption into three groups (more than 9 components, 5-8 components, and 0-4 components adopted), the proportion of schools with access to an AT increased with the number of recommended components implemented ($\chi^2=13.04$, $p<.001$) (Figure 2).

EAP Adoption in Secondary Schools

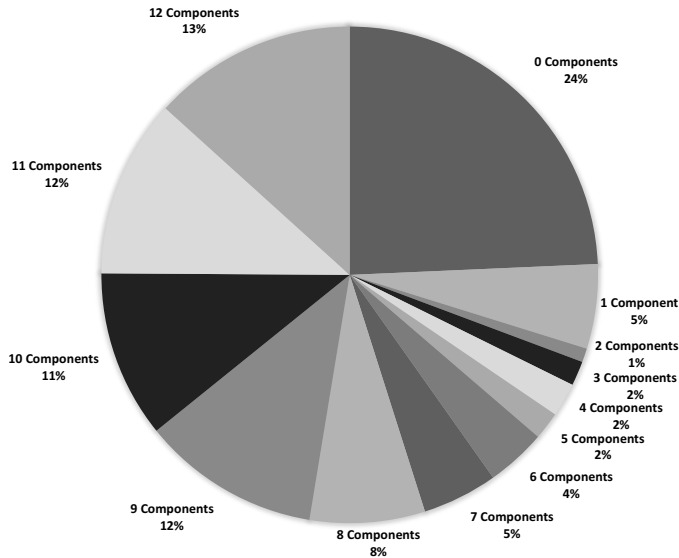


Figure 1. Percentage of Respondents with Number of Components Adapted in an EAP

Number of Schools with EAP Components in Schools With and Without Athletic Training Services

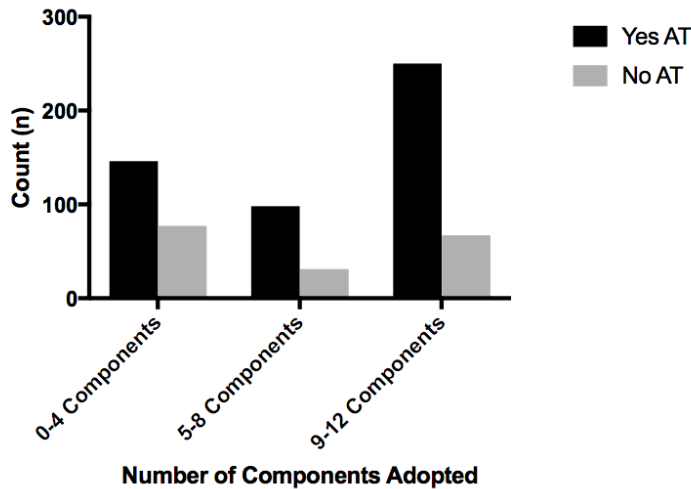


Figure 2. Components Adopted at HS (Separated into 0-4 Components, 5-8 Components, 9-12 Components). Schools with an AT are associated with having more components of an EAP compared to schools without an AT and access to an AT increases with the number of recommended components ($\chi^2=13.05, p<0.001$)

Discussion

The primary purpose of this investigation was to evaluate the current adoption of the comprehensive EAPs in secondary school athletics, as reported by AAs. Our data demonstrate that although a majority of AAs report having an EAP, the plan is often incomplete when assessed against the components outlined in the National Athletic Trainers' Association Position Statement: Emergency Planning in Athletics. Employment of an AT was also found to be associated with adoption of an EAP, preparation of venue-specific EAPs and adoption of 9 or more of the recommended components for EAPs.

Emergency Action Plan Adoption

While the proportion of AAs reporting developing an EAP is higher than previously reported (Lear et al., 2015; Monroe et al., 2009; Wasilko & Lisle, 2013), it is nearly identical to Harer and Yaeger (2014), who reported that 75% of respondents had an EAP at their school. Improved adoption of best-practices shows promise for increased safety for student athletes across the nation. Ensuring the EAP is venue specific and posted for all stakeholders to reference in the event of a medical emergency is necessary for efficient and effective activation of the EAP. AAs responding to our survey reported a higher adoption rate of a venue-specific EAP compared to a previous single state (Oregon) investigation (Johnson et al., 2017). While it is mandated that secondary schools adopt an EAP in Oregon, it is not mandatory that the EAP be venue specific. Seventeen states, however, do require a venue-specific EAP for secondary school athletics programs (Adams, Scarneo, & Casa, 2017). While the purpose of this investigation was not to associate state mandates with local adoption, one can consider that a state mandate of a venue specific EAP may increase the number of schools with venue-specific EAPs.

Rehearsal of an EAP is likely to improve the response to an emergency. However, fewer than one-half of AAs reported rehearsing the EAP. Literature on memory recall, which involves the searching of the memory stores, suggest that when we recall we produce something learned earlier if it is constantly practiced compared to retrieval cues without regular rehearsal (Broomfield, 1996; Gross, 1991). In brief, continued practice is needed as knowledge quickly deteriorates if not used or updated regularly (Broomfield, 1996). This theory can be demonstrated in the CPR re-training literature, which suggests there is a decay in knowledge as soon as two weeks after training, and up to 18 months, which describes why CPR retraining must be conducted every two years (Hamilton, 2005; Kaye & Mancini, 1986; Sullivan, 2015).

Only 13.3% ($n=89$) of AAs in this investigation reported adoption all of (12/12) the recommended components within their EAP. One plausible reason for the disconnect between EAP adoption and a comprehensive EAP with all of the recommended components is a lack of education on what components should be included in an EAP. Therefore, organizations such as the National Federation of High Schools, National Interscholastic Athletic Administrators Association and medical associations who endorse the best practice documents should collectively

develop strategies to educate AAs on the importance of a comprehensive EAP. Educational efforts such as platforms to help schools identify areas lacking for policy development, and tailored resources to the current adoption and implementation of policies at the school level are warranted to increase education of these stakeholders.

Athletic Trainer Presence

The National Interscholastic Athletic Administrators Association (NIAAA) defines the basic role of the athletic administrators as “providing leadership to the overall athletic program, as well as to manage the details necessary for its successful day-to-day operation.” Given this definition, athletic administrators oversee the entire athletic program, including assembling a collaborative team to improve sport safety. Incorporation of appropriate medical personnel, such as athletic trainers and emergency medical services (EMS), is essential to execute an EAP successfully. Our findings provide evidence to support that AT services appear to improve the likelihood of EAP adoption and adopting a venue-specific EAP. These findings corroborate previous study by Johnson et al. (2017) stating that athletic directors who employed an athletic trainer at the secondary school were strongly associated with the odds of having a venue-specific EAP. Despite ATs appearing to influence EAP adoption, along with the numerous other benefits ATs provide to athlete safety, only 70% of secondary schools in the nation employ AT services (Pryor et al., 2015). While ATs may be influencing EAP adoption, it is important to remember that, due to logistical constraints, ATs may not be at every athletic event, thus emergency response may fall on the responsibility of coaches. Having a concrete, written and visible plan that outlines the steps to carry out in the event of a catastrophic injury may help reduce delays of critical care to injured athletes.

Limitations and Future Research

Inherent response bias of AAs in that those with EAPs were more likely to respond to this survey warrants consideration in the interpretation of these results. As with most survey research, we assume truthfulness in responses. Furthermore, although this was a national study, the low response rate of athletic directors was concerning and may not provide a large enough, nor well-distributed response to represent all of the 50 states plus the District of Columbia. However, the 95% confidence intervals for the proportion data are narrow, demonstrating our data are near saturation. The lack of a comprehensive EAP may leave athletes vulnerable to fatal or debilitating outcomes to medical emergencies occurring during sport participation. Future studies should aim to explain factors influencing EAP adoption, including facilitators and barriers to adoption. Utilizing these data along with future data describing the facilitators and barriers to adoption, we can then work towards the creation of tailored strategies to improve EAP adoption nationally.

Conclusions

Despite greater EAP adoption, a low proportion of secondary school AAs report adopting a comprehensive EAP. Of particular concern is the reported lack of rehearsal and posting of the venue-specific EAPs. Only 13.3% of AAs reported having 12 out of 12 recommended components within their EAP. However, schools with access to an AT were at greater odds of adopting an EAP and developing a comprehensive EAP. These data show the need to educate all involved in secondary school athletics on the need for a comprehensive EAP in order to optimize the response to medical emergencies involving student athletes.

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