Emergency Action Plans in Secondary Schools: Barriers, Facilitators, and Social Determinants Affecting Implementation

Samantha E. Scarneo-Miller, PhD, ATC*†; Lindsay J. DiStefano, PhD, ATC†; Stephanie Mazerolle Singe, PhD, ATC, FNATA†; Johna K. Register-Mihalik, PhD, ATC‡; Rebecca L. Stearns, PhD, ATC*†; Douglas J. Casa, PhD, ATC, FNATA, FACSM*†

*Korey Stringer Institute and †Department of Kinesiology, University of Connecticut, Storrs; ‡Department of Exercise and Sport Science, University of North Carolina at Chapel Hill

Context: Secondary schools (SSs) inconsistently adopt emergency action plans (EAPs) for athletics.

Objective: To describe the barriers, facilitators, and social determinants influencing EAP adoption in SSs in the United States.

Design: Cross-sectional study.

Setting: Secondary schools.

Patients or Other Participants: A national sample of athletic trainers (ATs; n = 9642) and athletic directors (ADs; n = 9687) were invited to participate in a Web-based questionnaire. A total of 1273 (13.2%) ATs and 702 (9.2%) ADs responded to the survey.

Main Outcome Measure(s): The questionnaire addressed self-reported barriers to, facilitators of, and social determinants (eg, locale, funding classification [eg, public or private SS]) of EAP adoption. The responses of ATs and ADs were analyzed separately. Barriers, facilitators, and social determinants were evaluated using descriptive statistics. Contingency (2×2) tables were used to calculate the odds ratios (ORs) of adopting an EAP and the presence of each social determinant.

Results: Perceived barriers to implementation were a lack of knowledge about how to implement an EAP and financial limitations. Facilitators were having access to health care personnel, state mandates, and support from a person in an authoritative position. Compared with ATs at rural schools, ATs at suburban schools displayed greater odds of having an EAP ($\chi^2 = 5.63$, P = .01, OR = 1.63 [95% confidence interval = 1.08, 2.44]). According to the ADs' responses, a larger SS enrollment (\geq 500) led to greater odds of adopting an EAP (OR = 2.02 [95% confidence interval = 1.41, 2.89]).

Conclusions: Perceived barriers to EAP adoption suggest that ATs and ADs need to be educated so they can provide additional information on the low cost of EAP adoption. Further, ADs described state mandates as facilitators to improve EAP adoption; therefore, efforts to educate state leaders about the need for mandated policies may be warranted. Certain social determinants (eg, school enrollment) may affect EAP adoption, but not every proposed determinant significantly affected adoption.

Key Words: public health, socioecological framework, catastrophic injuries

Key Points

- Barriers to emergency action plan (EAP) adoption suggest that educational interventions for athletic trainers and athletic directors are warranted.
- Athletic directors cited state requirements as facilitators of EAP adoption.
- · Social determinants appeared to moderately affect early adoption of EAPs.

B mergency action plans (EAPs) are fundamental policies that help to improve the response time to and care of patients with catastrophic injuries that can occur during sport, yet not every US secondary school (SS) reported having an EAP.¹ Given the low cost of implementing an EAP policy, this lack of universal adoption is troubling.^{2–7} Emergency action plans should include the components outlined in the National Athletic Trainers' Association (NATA) position statement on emergency planning in athletics,⁸ such as coordinating with emergency medical services, creating venue-specific plans, posting the plan at all locations, and identifying the location(s) of emergency equipment.⁸ A recent study¹

showed that only 10% of SS athletic trainers (ATs) reported implementing an EAP that contained all of the components outlined in the NATA position statement. This finding regarding the lack of adoption and implementation of complete EAPs at the SS level is concerning, as many high school athletes may not receive the appropriate management for an injury or illness. Therefore, understanding the barriers to, facilitators of, and social determinants influencing implementation is imperative if future efforts to promote EAPs are to be effective.

Social determinants of health are "conditions in the environments in which people are born, live, learn, work, worship, etc that affect a wide range of health, functioning, and quality-of-life outcomes and risks."9 Examples of social determinants include socioeconomic status (SES), locale (eg, rural, suburban, urban), number of students, and funding classification. Investigators¹⁰⁻¹² have marginally evaluated such factors in the sports medicine community at the SS level, specifically policy development and implementation. As such, the sports medicine community lacks the information surrounding potential factors influencing policy adoption and especially EAP adoption by SSs. Counties with a lower SES demonstrated a higher incidence of sudden cardiac death in SSs, and county financial status was associated with emergency response plan implementation.¹³ Although this evidence suggests SES as a determinant in the implementation of emergency response plans, how SES and locale (eg, urban, suburban, rural subtypes) play roles in policy development, specifically with respect to EAPs in the SS setting, is unknown.

The number of students enrolled in a school (school size) may also contribute to EAP adoption at the SS level. Larger schools were more likely to have an automated external defibrillator (AED) compared with smaller schools.⁷ Access to athletic training services has shown a similar trend with larger schools providing more athletic training services compared with small schools (<500 students).¹⁴ In particular, schools without athletic training services had an average of approximately 175 athletes, whereas schools with athletic training services averaged 432 athletes.¹⁴ School size also led to differences in availability of both AEDs and athletic training services. However, compliance with a comprehensive EAP at the SS level by school size has yet to be evaluated.

Although the evaluation of social determinants may provide context to some characteristic barriers to EAP adoption, a thorough evaluation of the professed barriers and facilitators experienced by ATs and athletic directors (ADs) in SSs is critically needed. Currently, assessments of the barriers to and facilitators of EAP adoption in SS athletics are lacking; however, facilitators of state-level policy implementation have been evaluated. At the state level, 1 group¹⁵ reported that state-level policies were facilitated primarily by the death of a student-athlete, empirical data, and proactivity. Further, shared leadership by and open communication between medical professionals and members of the SS athletic association were identified as catalysts for policy change at the state level.¹⁵ These items specifically address changes to state-level policies, yet interactions across the socioecological framework may suggest that SS EAP adoption (organizational level) may be facilitated by similar factors (Figure 1).¹⁶

Emergency action plans are a vital aspect of any athletics organization, and as such, it is critical to examine the factors that influence their adoption to help guide future interventions aimed at improving adoption. However, no researchers have identified the reasons for the lack of adoption across the nation. Athletic trainers and ADs are, arguably, the most involved stakeholders in an SS athletics program, but uncertainty about their current perceived barriers to and facilitators of EAP adoption persists. Therefore, the primary purpose of our study was to explore the barriers to, facilitators of, and social determinants influencing EAP adoption as reported by ATs and ADs in SS athletics. Secondarily, we sought to identify if these stakeholders agreed or disagreed regarding the perceived



Figure 1. Socioecological framework. Provided that the socioecological framework suggests interactions across the levels, emergency action plan adoption at the organizational level may have similar facilitators and barriers as previously discussed at the policy level. Reprinted with permission from Scarneo SE, Kerr ZY, Kroshus E, et al. The socioecological framework: a multifaceted approach to prevent sport-related deaths in high school sports. *J Athl Train.* 2019;54(4):356–360.

barriers and facilitators related to EAP adoption. These data will provide a starting point for the creation of evidencebased strategies to improve EAP adoption.

METHODS

Research Design

We used a cross-sectional design to assess the barriers to, facilitators of, and social determinants influencing emergency preparedness based on questionnaire data collected from a national sample of SS ATs and ADs in the United States. This study was approved by the University of Connecticut Institutional Review Board.

Participants

Athletic trainers and ADs employed in the SS setting across the nation were invited to complete a questionnaire. The e-mail addresses of the schools' ADs were compiled by 20 individuals who accessed every SS's public domain Web site in the United States. When a state list was not available, we used the state high school athletics association public Web site to access the e-mail addresses. Athletic trainers were e-mailed invitations to participate in the study if they were members of the NATA or participated in the Athletic Training Locations and Services (ATLAS) Project.¹⁷ Athletic trainers who received e-mails from both sources were instructed to disregard the duplicate e-mail if they had already completed this survey. Questionnaire responses were anonymous; therefore, ATs and ADs from the same school may have responded. Thus, we analyzed the AT and AD responses separately.

Procedures

In May 2017, 9642 e-mails were sent to SS ATs, inviting them to complete a Web-based questionnaire (Qualtrics,

LLC, Provo, UT). A follow-up invitation was sent 1 week after the initial e-mail. In September 2017, e-mail invitations were sent to 9687 SS ADs, inviting them to complete the same Web-based questionnaire. Two followups were sent to ADs (compared with 1 to ATs) due to an initial low response rate by ADs. The 2 follow-up invitations to ADs were sent 1 and 3 weeks after the initial distribution.

Answers to a total of 2274 questionnaires were started in the Qualtrics system, yielding 1445 responses from ATs and 829 from ADs, for true response rates of 14.9% for ATs and 8.5% for ADs (Table 1). Incomplete questionnaires (<20% of questions answered) were removed, yielding 1273 representations from ATs and 702 from ADs, yielding valid response rates of 13.2% and 7.2%, respectively. The completion rate for these questionnaires was 88.14%. Percentages were based on the total number of respondents to each question; we made no assumptions regarding null responses to a question.

Questionnaire Design

Members of the research team who were experts in the fields of sport-related death (n = 8) and questionnaire development (n=3) created the questionnaire (Appendix). For the purpose of this study, the aim of the questionnaire was to assess the factors influencing overall EAP policy adoption and the 12 individual components outlined in the NATA position statement on emergency planning in athletics.⁸ Questions regarding demographic characteristics, specific barriers and facilitators and social determinants (eg, school size, locale) were also included. To identify barriers to EAP adoption, we asked: "Which, if any, of the following do you foresee as potential limitations to your school's ability to implement all aspects related to EAPs?" To identify facilitators of EAP adoption, we stated, "Select all of the following that you feel would make it easier to develop, revise, or practice your school's EAP." For both items, we asked participants to select all that applied.

Questionnaire Validation

Before dissemination, the questionnaire underwent a process for establishing content validity using a variety of perspectives (internal, external, and expert). Internal perspectives were those from within the research institution. External perspectives were provided by ATs and ADs from local SSs not involved with the research team. Experts were content authorities in the field of preventing sudden death in sport across a variety of domains, including cardiac conditions, exertional heat stroke, traumatic brain injuries, and cervical spine injuries. Based on the feedback from this process, we modified the questionnaire. A pilot study was conducted of 30 SS ATs and concluded with follow-up phone interviews. The purpose of these interviews was to gain a better understanding of participants' answers and to identify any gaps in the content of the questionnaire. Several questions were revised to improve wording for clarity and reduce confusion. Furthermore, the phone interviews provided additional barriers and facilitators, which were then added to the questionnaire.

Characteristic	Athletic Trainer	Athletic Director
Age, y (mean \pm SD) Students in school (mean \pm SD) Athletes in school (mean \pm SD)	$\begin{array}{r} 37.60\pm11\\ 1298\pm1883.72\\ 481\pm307.62 \end{array}$	$\begin{array}{r} 47.63 \pm 9 \\ 912.13 \pm 751.06 \\ 367.22 \pm 293.75 \end{array}$
Sex, %		
Male Female Prefer not to disclose	81.6 17.9 0.3	42.7 56.9 0.4
Ethnicity, %		
White Black or African American American Indian or Alaska	92.0 3.8	89.4 1.6
Native Asian	0.6 1.3	0.6 3.5
Native Hawaiian or Pacific Islander Hispanic Latino	0.3 1.9	0.5 4.4

Data Analysis

Due to the potential for overlap at the same school, AT and AD responses were analyzed independently. Dependent variables were EAP adoption and implementation of the components of EAPs as outlined in the NATA position statement.⁸ Independent variables were sex, age, ethnicity, years of experience, highest level of education, students enrolled in the school, setting, SES, funding classification, and perceived barriers to and facilitators of EAP adoption (Table 2). Each participant provided the zip code for his or her school, and those zip codes were used to find the SESs for public schools using US census data. Middle class was defined as a median household income between 67% and 200% of the state's median income, lower class was defined as less than 67% and upper class as more than 200% of the state's median income.¹⁸ Zip codes were then used to evaluate locale (rural, urban, suburban), as defined by the National Center for Education Statistics.¹⁹ School size dichotomization was determined based on previous literature¹⁴ showing that schools with \geq 500 students had a greater likelihood of hiring an AT. To draw conclusions consistent with previous research,¹ we classified participants as high adoption if 9 to 12 EAP components were adopted and low adoption if 8 or fewer components were adopted.

Adoption of EAP components by school characteristics (ie, school size, high adoption) was analyzed with separate 2×2 contingency tables using χ^2 tests of association and calculations of odds ratios (ORs) with 95% confidence intervals (CIs). Fisher exact tests of association were used when cell counts were less than 5. One analysis, a McNemar test, required a comparison across groups to evaluate disagreement between AT and AD responses for barriers to and facilitators of EAP adoption. Analyses were performed in SPSS (version 24; IBM Corp, Armonk, NY) with an a priori significance level of .05.

RESULTS

Results are provided by main outcome variable (barriers, facilitators, social determinants) and then separated by AT and AD responses.

Table 2.	Athletic	Trainer (A	T) and	Athletic	Director (A	AD)
Responde	er Demog	graphics a	nd Sch	ool Dem	ographics	а

Demographic	ATs (n = 1273)	ADs (n = 702)			
Employment mode					
Full time	902 (70.9; 68.4, 73.4)	NA			
Part time	248 (19.5; 17.3, 21.7)	NA			
Highest level of education	ation				
High school degree	NA NA	11 (1.6; 0.6, 2.5)			
Bachelor's	408 (32.1; 29.5, 34.6)	144 (20.5; 17.5, 23.5)			
Master's	774 (60.8; 58.1, 63.5)	480 (68.4; 64.9, 71.8)			
Doctorate	10 (0.8; 0.3, 1.3)	17 (2.4; 1.3, 3.6)			
Other	7 (0.5; 0.1, 1.0)	48 (6.8; 5.0, 8.7)			
Years in professional role					
<1	37 (2.9; 2.1, 4.1)	6 (0.9; 0.2, 1.5)			
1–5	295 (23.2; 22.2, 27.0)	192 (27.4; 24.1, 30.6)			
6–10	240 (18.9; 17.8, 22.3)	135 (19.2; 16.3, 22.1)			
11–15	151 (11.8; 10.7, 14.5)	102 (14.5; 11.9, 17.1)			
>15	476 (37.4; 36.9, 42.5)	261 (37.2; 33.6, 40.8)			
School enrollment					
<500	236 (18.5; 16.8, 21.2)	267 (38.2; 33.6, 40.8)			
\geq 500	1007 (79.1; 78.8, 83.2)	432 (61.8; 58.2, 65.4)			
Setting					
Urban	269 (21.1; 18.9, 23.4)	100 (14.3; 11.7, 16.8)			
Suburban	647 (50.9; 48.1, 53.6)	303 (43.2; 39.5, 46.8)			
Rural	231 (18.1; 16.0, 20.3)	231 (32.9; 29.4, 36.4)			
Socioeconomic status	b				
Low	55 (5.5; 4.4, 7.5)	51 (7.3; 5.3, 9.2)			
Middle	853 (84.6; 82.2, 86.8)	582 (82.9; 80.1, 85.7)			
High	37 (3.6; 2.9, 5.4)	11 (1.6; 0.6, 2.5)			
Funding classification					
Public	1008 (79.2; 77.0, 81.4)	656 (93.4; 91.6, 95.3)			
Private	224 (17.6; 15.5, 19.7)	10 (1.4; 0.5, 2.3)			
Charter	7 (0.5; 0.1, 1.0)	12 (1.7; 0.8, 2.7)			
Magnet	6 (0.5; 0.1, 0.8)	NA			
Vocational	6 (0.5; 0.1, 0.8)	2 (0.3; 0.0, 0.7)			
Other	7 (0.5; 0.1, 1.0)	4 (0.6; 0.0, 1.1)			

Abbreviation: NA, not available.

^a All values are expressed as n (%; 95% confidence interval).

^b Evaluated for public schools only.

Barriers

Athletic Trainers. To classify barriers to EAP adoption, we asked, "Which, if any, of the following do you foresee as potential limitations to your school's ability to implement all aspects related to EAPs?" The barrier with the highest proportion of responses was *financial limitations* (3.5%; Figure 2).

Athletic Directors. The barrier with the highest proportion of responses was *financial limitations* (23.8%; Figure 2).

Facilitators

Athletic Trainers. To classify facilitators of EAP adoption, we stated: "Select all of the following that you feel would make it easier to develop, revise, or practice your school's EAP." The facilitator with the highest proportion of responses was *requirement for policies to be in place* (29.0%; Figure 3).

Athletic Directors. Athletic directors reported seeing how other schools/programs facilitate implementation of *the EAP* (22.7%) as the highest recorded facilitator to EAP adoption (Figure 3).

McNemar Test of Disagreement for Facilitators and Barriers

We used a McNemar test to ascertain if ATs and ADs reported agreement or disagreement with the barriers and facilitators they encountered. Disagreement in the proportion of AT responses compared with AD responses was present for all barriers and facilitators (P > .001).

Social Determinants

Athletic Trainers. Athletic trainers who worked in suburban schools and were employed full time at their schools showed greater odds of having an EAP compared with those who worked in rural schools and were employed part time (Table 3). Further, ATs working in suburban schools also displayed greater odds of having a venue-specific EAP ($\chi^2 = 8.50$, P = .004, OR = 1.88 [1.22, 2.89]) compared with ATs working in rural schools. When we compared ATs' educational levels (bachelor's versus master's) with the number of components adopted, ATs with a master's degree were associated with adopting 9 or more components of an EAP compared with ATs who possessed a bachelor's degree ($\chi^2 = 4.50$, P = .03, OR = 1.31 [1.02, 1.67]).

Athletic Directors. Athletic directors with 6 to 15 years of experience and >15 years of experience demonstrated greater odds of adopting an EAP compared with ADs with 0 to 5 years of experience (P < .05; Table 3). When separating the respondents into schools with <500 or ≥500 students, associations were noted with EAP adoption ($\chi^2 = 14.99$, P < .001, OR = 2.02 [1.41, 2.89]), venue-specific EAPs ($\chi^2 = 15.90$, P < .001, OR = 2.16 [1.47, 3.16]), posting the EAP ($\chi^2 = 4.65$, P = .03, OR = 1.54 [1.04, 2.30]), and a high level of adoption ($\chi^2 = 8.69$, P < .003, OR = 1.60 [1.17, 2.20]) as outlined in the NATA position statement.⁸

DISCUSSION

Our key findings suggested that the presence of an AT employed full time increased the odds of EAP adoption. In addition, EAP adoption was associated with ADs who had 6 or more years of experience. Further, barriers to implementation for both ATs and ADs included financial limitations, while a facilitator of EAP adoption for ATs and ADs was seeing how others accomplished this. Altogether, our findings provide preliminary data for future efforts to create evidence-based interventions to improve EAP adoption.

Barriers

One-quarter of ADs responded that financial limitations were a perceived barrier to EAP adoption compared with fewer than 5% of AT respondents. The difference between these populations may be that ATs have been educated as to what an EAP is and thereby know that EAP implementation is a no- to low-cost policy. This can be further explained by the fact that approximately 10% of ADs stated a barrier to implementing an EAP was that they "need[ed] more



Figure 2. Barriers to emergency action plan adoption. The barrier with the highest response rate for both athletic trainers and athletic directors was *financial limitations*.

information as to what an EAP is." Lack of education of ADs may reflect the lack of education of other stakeholders in the SS setting. When we investigate potential determinants to explain why SSs are not adopting best practices such as EAPs, it is important to explore the socioecological framework and educate all stakeholders involved with the school community.

Facilitators

For both groups of respondents, facilitators of EAP implementation cited having access to a health care professional, support from administration, seeing how others implement an EAP, mandates from state SS athletics associations, and state laws. Given the evidence to support the need for athletic training services in a SS,^{5,14} nearly 1 in 5 ADs stated that having a medical professional (such as an AT) at the school would make it easier for them to develop an EAP. Previous researchers⁵ found that access to an AT was associated with implementing an EAP and a venue-specific EAP. Although it is promising that ADs recognized the importance of an AT, ADs also identified limitations to hiring an AT, such as budgeting decisions, misconceptions about roles, and lack of community support.²⁰

Interestingly, ADs reported that mandates from state SS athletics associations and state legislation would make it easier for them to implement an EAP. Adams et al²¹ noted that only 47% of states mandated EAPs for schools. Future researchers should evaluate whether states that require schools to have an EAP actually have an EAP and if the

EAP is more comprehensive than in states that do not require EAPs. Because the ADs in this study reported financial limitations as a barrier to adoption and a state mandate as a facilitator of adoption, future authors may aim to identify whether ADs perceive a state mandate as a proxy for adequate funding in school systems. If a link is found, educational efforts may be warranted to demonstrate that EAP adoption can occur at no cost. As the current findings show that ATs and ADs disagreed about what the barriers to and facilitators of EAP implementation were, education of stakeholders, again, is vital to improving EAP adoption in SSs. Incorporation of the socioecological framework and the interpretation of behavior across all stages is imperative to begin to understand the sports medicine community and how to address the individual factors across levels.

Social Determinants

A majority of the ATs and ADs who responded to the questionnaire were from suburban, middle-class, and public schools. Consequently, interpretation of the results must account for the lack of a normal distribution across groups. Athletic trainers and ADs who worked in suburban schools were associated with greater odds of having an EAP as outlined in the NATA position statement.⁸ These findings are not surprising given the larger number of schools classified as suburban, which resulted in uneven group sizes.





Figure 3. Facilitators of emergency action plan adoption. The facilitator with the highest response rate was a requirement for policies to be into place for athletic trainers and see how others facilitate for athletic directors.

Table 3.	Odds	Ratios	for	Social	Determinant	Analy	/sis

	Odds Ratio (95% Confidence Interval)		
Characteristic	Athletic Trainers	Athletic Directors	
Employment status			
Full time versus part time	2.07 (1.28, 3.38) ^a	NA	
Highest level of education			
Bachelor's versus master's	1.25 (0.86, 1.85)	1.30 (0.85, 2.0)	
Years in professional role			
0-5 versus 6-15	1.27 (0.77, 2.09)	1.67 (1.08, 2.60) ^a	
0–5 versus >15	0.94 (0.60, 1.47)	1.71 (1.11, 2.73) ^a	
6–15 versus >15	0.74 (0.47, 1.16)	1.01 (0.66, 1.57)	
School enrollment			
${<}500$ versus ${\geq}500$	1.52 (0.99, 2.35)	2.02 (1.41, 2.89) ^a	
Setting			
Urban versus suburban	0.88 (0.51, 1.56)	0.88 (0.50, 1.55)	
Urban versus rural	1.45 (0.83, 2.55)	1.45 (0.83, 2.55)	
Suburban versus rural	1.63 (1.09, 2.44)ª	1.63 (1.09, 2.44) ^a	
Socioeconomic status			
High versus low	1.44 (0.46, 4.52)	0.73 (0.61, 0.85)	
High versus middle	1.02 (0.39, 2.64)	0.76 (0.72, 0.79)	
Low versus middle	1.41 (0.70, 2.85)	1.19 (0.63, 2.27)	
Funding classification			
Public versus private	2.56 (1.36, 4.86) ^a	2.5 (0.31, 20.15)	
Sex			
Male versus female	1.10 (0.76, 1.60)	1.02 (0.64, 1.64)	

Abbreviation: NA, not available.

^a Delineates significance with χ^2 test of association.

Previous authors²² found that counties with a lower SES demonstrated a higher incidence of sudden cardiac death in SS athletes. We determined that proxy SES for public schools did not play a role in a lack of EAP adoption, which demonstrates that the higher incidence of sudden cardiac death may not be attributed to EAP adoption. Although these findings are promising in that SES did not influence EAP adoption, it is important to note they are inconsistent with the previous literature,¹³ and more research should be done to investigate whether SES plays a role in the adoption of sports medicine policies. Further, when separating the AD responses into those at schools of <500 and >500 students, associations were noted with EAP adoption, venue-specific EAPs, and posting the EAPs. These results are comparable with those of Pryor et al,¹⁴ who reported that larger schools (\geq 500 students) provided more athletic training services than small schools, further indicating the need for interventions to support smaller schools in improving sport safety.

The presence of an AT has been associated with EAP adoption as well as having an EAP that is venue specific.⁵ Our results suggest that ATs with master's degrees were associated with having more components of an EAP compared with ATs who had bachelor's degrees. In 2015, the Athletic Training Strategic Alliance "jointly acted on establishing a master's degree as the professional degree for athletic training."²³ Although we did not specifically inquire if the master's degrees held by our AT sample were professional or postprofessional, these data indicate that the degree level affected EAP adoption. These observations provide support for the Athletic Training

Strategic Alliance to establish the master's degree as the professional degree for athletic training. As ATs are health care professionals trained in emergency prevention, care, and the treatment of catastrophic injuries, these findings support the need for athletic training services in every SS in the nation.

Limitations and Future Research

As with most questionnaire research, we assumed truthfulness in responses. Additionally, an inherent response bias might have been present in ATs and ADs such that those with EAPs were more likely to respond to this questionnaire and warrants consideration when interpreting these results. The structure of this study allowed for selfreporting of barriers and facilitators by selecting all that apply from a prepopulated list. Although this method is common²⁴ in questionnaire research, future investigators should aim to qualitatively explain what ATs and ADs are feeling and experiencing with regard to barriers to and facilitators of policy implementation. The lower response rate of ADs raises concern; however, given the narrow CIs and the geographic locations of the participants, we are confident in our ability to draw conclusions. Future authors should investigate whether ATs or ADs are more reliable in their responses as they relate to the policies actually implemented at their schools. Another limitation of this study was the collection of anonymous data, including the school name. This design meant that we were unable to match AT and AD responses and therefore analyzed each group's responses separately. Future researchers should collect data from both stakeholder groups in an identifiable way to enable comparisons. Also, without being able to identify school names, we were unable to examine the effect of free and reduced lunch percentages along with Title 1 status, which may be additional factors determining proxy SES.

As state SS athletics association mandates and state legislation were recognized as primary facilitators, future investigators should examine compliance with mandates and legislation. Our results and those of previous studies¹ provide evidence to support the adoption of comprehensive EAPs. Moreover, the influence of these mandates on implementation at the local SS level must be assessed. These findings offer preliminary evidence as to the current barriers to and facilitators and social determinants of SSs with regard to the implementation of EAPs. Improved advocacy efforts in creating tailored strategies to address these key components in the adoption of EAPs are imperative.

CONCLUSIONS

Emergency action plans are an essential policy in SS athletics. Though rare, catastrophic injuries including sportrelated death do occur in athletics, and they do not discriminate by school size, SES, locale, funding classification, or other determinants. Our findings showed that health inequities existed in suburban schools: associations were evident between locale and access to emergency equipment and EAPs and school size and EAP implementation. Barriers to implementation included financial limitations and lack of knowledge among stakeholders in an SS athletics program. Facilitators of EAP implementation included having a medical professional available, support from administration, and state laws or mandates from the state SS association. Theories such as the socioecological framework are important for creating efficient and effective tailored strategies for SSs to adopt EAPs. Future researchers should explore these various determinants to EAP implementation and create tailored intervention strategies to improve the dissemination of information to facilitate improved EAP adoption at the SS level.

ACKNOWLEDGMENTS

This study was partially funded by the NATA Research & Education Foundation. We thank Linnea Geary for her assistance in the collection of the social determinants data. Thank you also to the ATs and ADs who volunteered their time to complete the questionnaire.

REFERENCES

- Scarneo SE, DiStefano LJ, Stearns RL, Register-Mihalik JK, Denegar CR, Casa DJ. Emergency action planning in secondaryschool athletics: a comprehensive evaluation of current adoption of best practice standards. *J Athl Train*. 2019;54(1):99–105.
- Toresdahl BG, Harmon KG, Drezner JA. High school automated external defibrillator programs as markers of emergency preparedness for sudden cardiac arrest. J Athl Train. 2013;48(2):242–247.
- Olympia RP, Dixon T, Brady J, Avner JR. Emergency planning in school-based athletics: a national survey of athletic trainers. *Pediatr Emerg Care*. 2007;23(10):703–708.
- Harer MW, Yaeger JP. A survey of certification for cardiopulmonary resuscitation in high school athletic coaches. WMJ. 2014;113(4):144–148.
- Johnson ST, Norcross MF, Bovbjerg VE, Hoffman MA, Chang E, Koester MC. Sports-related emergency preparedness in Oregon high schools. *Sports Health*. 2017;9(2):181–184.
- Monroe A, Rosenbaum DA, Davis S. Emergency planning for sudden cardiac events in North Carolina high schools. N C Med J. 2009;70(3):198–204.
- Wasilko SM, Lisle DK. Automated external defibrillators and emergency planning for sudden cardiac arrest in Vermont high schools: a rural state's perspective. *Sports Health*. 2013;5(6):548– 552.
- Andersen J, Courson RW, Kleiner DM, McLoda TA. National Athletic Trainers' Association position statement: emergency planning in athletics. *J Athl Train*. 2002;37(1):99–104.

- Social determinants of Health. Healthy People 2020 Web site. https://www.healthypeople.gov/2020/topics-objectives/topic/socialdeterminants-of-health. Accessed June 25, 2019.
- Kroshus E, Fischer AN, Nichols JF. Assessing the awareness and behaviors of US high school nurses with respect to the female athlete triad. *J Sch Nurs*. 2015;31(4):272–279.
- Kroshus E, Garnett B, Hawrilenko M, Baugh CM, Calzo JP. Concussion under-reporting and pressure from coaches, teammates, fans, and parents. *Soc Sci Med.* 2015;134:66–75.
- Sherrid MV, Aagaard P, Serrato S, et al. State requirements for automated external defibrillators in American schools: framing the debate about legislative action. J Am Coll Cardiol. 2017;69(13):1735–1743.
- 13. Griffin H, Band R, Ruther M, et al. Employment and residential characteristics in relation to automated external defibrillator locations. *Am Heart J.* 2016;172:185–191.
- Pryor RR, Casa DJ, Vandermark LW, et al. Athletic training services in public secondary schools: a benchmark study. J Athl Train. 2015;50(2):156–162.
- Pagnotta KD, Mazerolle SM, Pitney WA, Burton LJ, Casa DJ. Implementing health and safety policy changes at the high school level from a leadership perspective. *J Athl Train*. 2016;51(4):291– 302.
- 16. Scarneo SE, Kerr ZY, Kroshus E, et al. The socioecological framework: a multifaceted approach to prevent sport-related death in high school sports. *J Athl Train.* 2019. In press.
- Athletic Training Locations and Services (ATLAS Project). Korey Stringer Institute Web site. https://ksi.uconn.edu/nata-atlas/. Accessed February 15, 2018.
- 18. American FactFinder. Choice Reviews Online. 2011;48(11):6035.
- National Center for Education Statistics (NCES) locale classifications and criteria. National Center for Education Statistics Web site. https://nces.ed.gov/programs/edge/docs/LOCALE_ CLASSIFICATIONS.pdf. Accessed February 12, 2019.
- Mazerolle SM, Raso SR, Pagnotta KD, Stearns RL, Casa DJ. Athletic directors' barriers to hiring athletic trainers in high schools. *J Athl Train*. 2015;50(10):1059–1068.
- 21. Adams WM, Scarneo SE, Casa DJ. State-level implementation of health and safety policies to prevent sudden death and catastrophic injuries within secondary school athletics. *Orthop J Sports Med.* 2018;6(2):2325967117752129.
- 22. White MJ, Loccoh EC, Goble MM, Yu S, Odetola FO, Russell MW. High school cardiac emergency response plans and sudden cardiac death in the young. *Prehosp Disaster Med.* 2017;32(3):269–272.
- 23. The professional degree. CAATE Web site. https://caate.net/the-professional-degree/. Accessed February 12, 2019.
- 24. Lavrakas PJ. *Encyclopedia of Survey Research Methods*. Thousand Oaks, CA: SAGE Publishing; 2008.

Address correspondence to Samantha E. Scarneo-Miller, PhD, ATC, Korey Stringer Institute, Department of Kinesiology, University of Connecticut, 2095 Hillside Road, U-1110, Storrs, CT 06269-1110. Address e-mail to samantha.scarneo@uconn.edu.

Appendix. Emergency Action Plan (EAP) Questionnaire^a

Are you currently working in a high school setting?

- Yes
- No*
- *Skip to end of survey.

What is your current role or position at your high school?

- Principal/headmaster*
- Athletic director
- Head coach*
- Assistant coach*
- Nurse*
- Athletic trainer
- Parent of a student-athlete*
- Student-athlete*

*Skip to end of survey.

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-06-18 via free access

General Information

What state are you from?

\checkmark Dropdown menu of states + DC

Sex

- Male
- Female
- Prefer not to disclose

What is your age? _____

What type of high school are you currently working at?

- Public
- Private
- Charter
- Magnet
- Vocational
- Other

What is your school's zip code? _

Approximately how many students are enrolled at your high school? _____.

Approximately how many student athletes are at your high school? _____.

How many years have you served in your professional role?

- $\circ~$ Less than 1 year
- \circ 1–5 years
- \circ 6–10 years
- \circ 11–15 years
- More than 15 years

How many years have you served in your role at your current school?

- $\circ~$ Less than 1 year
- 1–5 years
- \circ 6–10 years
- 11–15 years
- More than 15 years

What is the highest level of education you have earned?

- High school diploma (or equivalent)
- Bachelor's degree
- Master's degree
- Doctorate

• Other _____

Do you work full time or part time? Definitions: Full time: AT services provided to only 1 school, 5 days a week, 30 hours per week, and 10 months per year. Part time: Anything less than full time.

• Full time

• Part time

Which, if any, of the following do you foresee as potential limitations to your school's ability to implement all aspects of related to EAPs? Please check all that apply.

- Resistance or apprehension from coaches.
- Resistance or apprehension from athletic directors or other administrators.
- Resistance or apprehension from parents or legal guardians.
- Financial limitation.
- $\circ\,$ My school does not have the time to train the coaches and school personnel.
- $\circ\,$ My school does not have the time to educate the parents or legal guardians.
- My school would need more information, assistance, etc. in order to implement all of the EAP guidelines.
- $\circ\,$ We do not know where to start to adopt an EAP.
- $\circ\,$ My school does not have an AT.

Select all of the following that you feel would make it easier to develop, revise, or practice your school's EAP:

- Having a health care professional(s) (ie, athletic trainer) at the school.
- Support from someone in an authoritative position (athletic director, nurse, school leader, etc).
- Seeing how other schools/program facilitate implementation of the EAP.
- Requirement for policies to be put into place.
- Protected administrative time.
- Nothing would make it easier.
- Mandates from high school athletics association.
- State legislation.
- Legal counsel support.

^a Questionnaire is reproduced in its original form. Note: AT indicates athletic trainer.