Coaching Applications

The Knowledge, Attitudes and Beliefs of Pediatric Concussion Among USA Swim Coaches

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Abstract

Coaches play a key role in the concussion management team in recognizing and removing student-athletes from play, as they are on the frontline and often closest to the student-athletes. Youth and club sports are unique in that there are few states in the United States that require coaches to receive formal concussion education when compared to high school or collegiate levels. Though concussions occur less frequently in swimming, knowledge and understanding is nonetheless important. This study examines USA Swim Coaches' current knowledge, perceived knowledge, and confidence in knowledge of several topics related to sport-related concussion. Most importantly we found that club swim coaches who had prior concussion education were more knowledgeable in various sport-related concussion topics which shows that the positive impact of concussion education should extend to youth club sports and require that all youth sport coaches receive concussion education. We have made several recommendations in order to assist coaches with proper management of sport-related concussion.

Introduction

All individuals involved in sport, including referees, coaches, student-athletes, and parents have begun to recognize the dangers of sustaining a concussion. In swimming potential head strikes and concussions can occur during dryland, an in-water collision, or a collision with another athlete and are more common in practices than competition.

More emphasis is being placed on protecting student-athletes from further injury and harm that could occur by continuing to participate in sport while suffering from a concussion. Several best practice guidelines and national healthcare organization position statements include recommendations regarding physical rest, cognitive rest, and some include recommendations for academic adjustments.

Rather than being handled by a single individual, concussion management should involve a team approach to provide the highest quality of care. Coaches have an important role in concussion management, from recognizing signs of a concussion to supporting the student-athlete during recovery. Several state and national sport safety laws[1, 21] require coaches within the secondary school setting to receive formal concussion education, but year-round and travel youth teams may not be required to follow such rules. Therefore, knowledge translation across youth coaches may vary.

USA Swimming is one such unique organization in that it has a large number of participants, with well over 400,000 members and more than 2,800 teams across the United States. Though concussions occur less frequently in this population, knowledge and understanding of pediatric concussion is nonetheless important. Currently, there is limited knowledge regarding how USA Swimming club coaches manage concussions when there is no legislation that guides youth club sport teams. Therefore, the purpose of this study was to evaluate the knowledge, attitudes, and beliefs of USA Swim Coaches regarding concussion management of swim athletes following sport-related concussion.

Methods

Design and Participants

The survey entitled, *Club Swim Coaches' Beliefs, Attitudes, and Knowledge of Pediatric Athletes with Concussions* (BAKPAC-SWIM), was sent to 17,990 club swim coaches affiliated with USA Swimming via email. Email addresses were obtained from the USA Swimming administrative office for distribution.

Instrumentation

The final survey was separated into 5 sections: knowledge, AT collaboration, established relationships with healthcare providers, academic adjustments, and demographics. This study will focus on participants' perceived importance (6 items); knowledge (7 items); and confidence in their knowledge (6 items) regarding several topics related to concussion as well as establishing club swim coaches' relationships with healthcare providers.

Procedures

Data collection occurred over a 4-week period. An initial email was sent at the beginning of the data collection period that included the purpose of the study, how long the survey took to complete, a request to complete the survey, and the survey due date. Two reminder emails were sent during the 4-week period until the deadline. Consent was implied based on voluntary decision to complete the survey.

Results

Of the convenience sample of 17,990 coaches, 547 club swim coaches accessed the survey and completed at least one part of the survey and 385 club swim coaches completed the survey in its entirety. Respondents included 207 men and 178 women (age=43.0±12.7 years; coaching experience=14.5±11.2 years) from 46 states.

Objective Concussion Knowledge
Most participants correctly identified the part of the body injured during a concussion as the brain (95.1%), while others incorrectly identified the skull (4.9%). Overall, participants were able to identify more general symptoms, but fewer were aware of the later manifesting symptoms.

Perceived Importance, Knowledge, and Confidence in Knowledge
The majority of coaches perceived they were moderately knowledgeable in prevention of concussion, physical signs and symptoms, cognitive signs and symptoms, treatment and management, and return-to-play criteria, but only minimally knowledgeable in academic accommodations and return-to-learn criteria.

Concussion Education
Nearly 63% (n=242/385) of coaches reported having prior concussion education. Both perceived knowledge and perceived confidence in knowledge was significantly greater among coaches with prior education across all topics of sport-related concussion.

Athletic Trainer Access
Twenty-six percent (n=103) of coaches reported access to an AT, while 74% (n=293) did not. Perceived knowledge was greater among coaches with AT access for treatment/management, academic accommodations, return-to-learn, and return-to-play. Perceived confidence in knowledge was significantly greater among coaches with AT access for physical signs/symptoms, cognitive signs/symptoms, academic accommodations, return-to-learn, and return-to-play.

Access and Collaboration with Healthcare Providers
Just over one-quarter of coaches felt that access to medical care for their club was limited. Coaches reported established relationships with athletic trainers (20.1%), family physicians (19.4%), physical therapists (18.4%), orthopedic specialists 13.8%), and sports medicine physicians (12.4%). However, 43% of coaches reported their club does not have any established relationships with healthcare providers and 24.5% were unsure whether the club has established relationships.

When coaches were asked who they would refer athletes to with a suspected sport-related concussion, answers varied. For the primary referral, coaches reported they would send athletes to their primary care physician (54.3%), an athletic trainer (16.7%), or leave it to the parents to decide (15.1%).

Discussion

Club swim coaches were able to identify the most common signs and symptoms of concussion including headache, nausea/vomiting, dizziness, blurred vision, balance problems, and confusion but were not able to identify later manifesting symptoms. There are several signs and symptoms that can be observed or that is reported by the athlete. Concussion symptoms vary, not all athletes will have the same symptoms or recovery time. Signs and symptoms can develop right away or up to 48 hours after injury.

Signs and Symptoms that may develop right away

- Headache
- "Pressure in head"
- Neck pain
- Nausea or vomiting
- Dizziness
- Blurred vision
- Confusion
- Balance problems
- Sensitivity to light
- Sensitivity to noise
- Feeling in a fog
- Feeling slowed down
- "Don't feel right"

Signs and Symptoms that may develop later

- Difficulty remembering
- Difficulty concentrating
- Fatigue or low energy
- Trouble falling sleep
- Drowsiness
- More emotional
- Irritable
- Sadness
- Anxiousness

Coaches reported it was extremely important to have knowledge of how concussions occur, how to prevent concussion, and what to do when they suspect a student-athlete has a concussion.

Recognize and Remove

- Understand how concussions occur and the signs and symptoms of concussion
- Athletes who you may think have a concussion should be immediately removed from activity and evaluated by a qualified healthcare provider
- Ignoring signs or symptoms of a concussion puts the athlete at risk
- No athlete should return without clearance from a qualified healthcare professional

Coaches who had prior concussion education were more knowledgeable and more confident in their knowledge in regard to identifying concussion symptoms, treatment/management, academic accommodations, return-to-learn and return-to-play. The positive impact of concussion education should extend to youth club sports and

require that all youth sport coaches receive concussion education. Areas for improving education include return-to-learn and cognitive rest.

Almost half of coaches reported not having any access to healthcare providers. Those with established relationships with athletic trainers were more knowledgeable regarding treatment/management, academic accommodations, return-to-learn and return-to-play. The majority of coaches said they would refer an athlete to their primary care physician or leave it up to the parent to decide where to take the athlete. Second most common referrals were to an athletic trainer. As coaches are often the point person in directing parents to qualified healthcare professionals, it is key to understand who an athlete with a suspected concussion should be referred to.

Qualified Healthcare Providers:

The following individuals may evaluate and provide treatments to athletes with sport-related concussion. Check your local and state rules for more information.

- Athletic Trainer
- Family Physician
- Sports-Medicine Physician
- Concussion Specialist or Neurologist
- Emergency Room Physicians
- Physician Assistant
- Nurse Practitioner

Return to Learn

Almost all coaches agreed that participation of physical activity should be limited when the student-athlete is experiencing symptoms of a concussion but just over half agreed that there should be limitations in cognitive activity too. The lack of knowledge and lack of perceived knowledge in this area shows it is critical to provide more information for coaches on return-to-learn and cognitive rest.

All pediatric athletes are also students, so the need for treatment and rest extends beyond the pool. Qualified healthcare professionals may recommend returning to school with limitations on duration of attendance, or with academic adjustments. Academic adjustments are used to help provide students support at school to limit the potential of worsening concussion symptoms. Depending on each individual's signs and symptoms this may include different adjustments. Prior to return to play, athletes should be back to regular school schedule and activities. As symptoms decrease, the extra help can be removed.

An athlete may be in need of academic adjustments for:

- Problems paying attention
- Problems remembering or learning new information
- Needing more time to complete tasks
- Greater irritability
- Decreased ability to cope with stress

Return to Play

In order to safely return to swimming, the athlete must be clear of all concussion symptoms prior to the start of the return to play progression. Athletes who are immediately removed from play and followed proper return to play protocol return faster than those who continue to participate in their sport.

Graduated Return-to-Swim:

- Step 1: Symptom Limited Activity
- Step 2: Light aerobic exercise
  - 20 minutes; 55-65% max heart rate; Kickboard only or exercise bike
- Step 3: Sport Specific Exercise
  - 30 minutes, 65-70% max heart rate; limited head movement progress through strokes in the following order: breast, back, free, fly
- Step 4: Non-contact training drills
  - 30 minutes, 70-80% max heart rate; more complex interval training; open turns only
- Step 5: Full practice
  - Including starts and flip turns
- Step 6: Return to Swim

Conclusion

Coaches are key in recognizing and removing student-athletes from play as they are on the frontline, often closest to the injury and the student-athlete. Education has shown to improve attitude, perceived knowledge, and perceived confidence in knowledge. Furthermore, access to athletic trainers are key in providing coaches with the tools they need to help a student-athlete through the recovery process. Formal concussion education can help provide coaches important information to recognize, support, and understand the recovery process. Coaches and youth sports teams should establish relationships with local athletic trainers and sports medicine physicians, in the event of a sport-related concussion that individual can provide guidance for care and referral of student-athletes.

Other Resources:

USA Swimming Concussion Information Sheet (for parents and athletes) - https://www.usaswimming.org/docs/default-source/usas-convention/2017-usas-convention/concussion-info-sheet-for-parents-and-swimmers.pdf

Centers for Disease Control and Prevention - www.cdc.gov/Concussion

Zurich Concussion Conference (2012) - Consensus statement on concussion in sport: the 4th International Conference on Concussion in Sport held in Zurich, November 2012. http://bjsm.bmj.com/content/47/5/250.full

ODH Violence and Injury Prevention Program - www.healthyohioprogram.org/concusion

National Federation of State High School Associations - www.nfhs.org – Index concussions and see "A parent's guide to concussion in sports".