Understanding the Level of Concussion Knowledge in High School Sports in New Jersey

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The presenter has no relevant relationships to disclose.
Overview

- Background
- Objectives
- Methods
- Results*
- Discussion*
- Conclusions
NJ Concussion Law (Sept 2011) based on 1st concussion law (Washington State 2009) made mandatory:

- HS policy on concussion prevention and treatment
- Coaches and Certified Athletic Trainers (ATCs): annual educational program
- Parents/guardians: fact sheet annually

Coaches, ATCs and parents/guardians instrumental to early detection and recovery

Ensuring appropriate training: paramount to prevention and management of concussions, PCS and SIS
1. Level of concussion knowledge: Overall scores
   • Between group comparisons

2. Knowledge gaps: Frequency of correct responses per item
   • Factual versus Applied (Identification + Management) knowledge*

3. Other Factors
   • Confidence in ability to recognize/manage concussions
   • Access to educational materials/resources
Methods

- **Participants:**
  - Inclusion: NJ hs coaches, ATC, and parents/guardians of student-athletes in public, private, and recreational leagues.
  - Exclusion: non hs level athletic community
  - Consent by completing anonymous survey

- **Research procedures:**
  - Letter detailing study with survey link distributed via email to athletic directors (ADs) and principals
  - Emails also sent by NJAD, NJSIAA, BIANJ
  - 2 surveys: coaches/ATCs and parents/guardians*
  - Open December 2012 to May 2013
<table>
<thead>
<tr>
<th>Objective</th>
<th>Subject of Measurement, Comparison</th>
<th>Statistical Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Level</td>
<td>Overall scores</td>
<td>t-test</td>
</tr>
<tr>
<td>Knowledge Gaps</td>
<td>Factual versus Applied knowledge&lt;br&gt;Frequency of correct responses per test item</td>
<td>t-test&lt;br&gt;Frequency data</td>
</tr>
<tr>
<td>Associations</td>
<td>Confidence Access</td>
<td>Pearson Chi-Square</td>
</tr>
</tbody>
</table>
Survey questions: Overview

- Demographics:
  - Participant’s role - Coach/ATC or Parent/guardian
  - Concussion experience and education
  - County, Setting

- Knowledge test: Total of 17; 80% score cutoff
  - Factual (questions 1-9)
  - Application: Identification (10-13) and Management* (14-17)

- Other Factors
  - Self assessment of confidence
  - Access to materials/education
Results: Demographics

<table>
<thead>
<tr>
<th>Category</th>
<th>Completed Survey</th>
<th>Missing Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coaches and ATCs</td>
<td>n= 75</td>
<td>2</td>
</tr>
<tr>
<td>Parents and Guardians</td>
<td>n= 65</td>
<td>10</td>
</tr>
<tr>
<td>Totals</td>
<td>n = 140</td>
<td>2</td>
</tr>
</tbody>
</table>

- Majority: public school
- Parents: Gloucester County
- Metro area: NY and Philadelphia
- Coaches/ATCs-NY Metro area
- Parents/guardians-Philadelphia Metro area
Analysis for Objective 1:
Level of Concussion Knowledge

• Overall score

• Total number of correct responses divided by total number of items tested (17)
Results: Objective 1: Total Scores

Parents: 6 (9.2%)

Coaches: 1 (1.3%)

Number of Respondents ≥80%* p<0.0001

Total Score*
Results: Mean Scores Between Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>factual (9)</td>
<td>8.4</td>
</tr>
<tr>
<td>application (8)</td>
<td>7.5</td>
</tr>
</tbody>
</table>

p < .0001

< 80%

Coaches/ATCs

Parents
Analysis of Objective 2: Gaps in knowledge

Areas of inadequate knowledge by different levels: Factual Application (Identification + Management)

Specifics: Frequency of correct responses per test item

Items scoring <80% accuracy in response rate → knowledge gap
<table>
<thead>
<tr>
<th>Knowledge Gap</th>
<th>Subject Area</th>
<th>Specific Test Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factual</td>
<td>Facts respondents</td>
<td>Can an athlete have symptoms of a concussion or have results on baseline testing (ImPact) suggestive of a concussion and not have sustained a concussion?</td>
</tr>
<tr>
<td>Application</td>
<td>Identification</td>
<td>She feels dizzy and has a headache for 5 minutes.</td>
</tr>
</tbody>
</table>
### Results: Objective 2: Gaps in Knowledge, Subject Areas and Specific Test Items Scoring Below 80%: Parents/Guardians

<table>
<thead>
<tr>
<th>Knowledge Gap</th>
<th>Subject Area</th>
<th>Specific Test Item</th>
</tr>
</thead>
</table>
| Factual       | Facts        | *Does a return to baseline testing score correlate with resolution of symptoms and signal a green light to RTP?*  
Can an athlete have symptoms of a concussion or have results on baseline testing (ImPact) suggestive of a concussion and not have sustained a concussion? |
| Application   | Identification | She feels dizzy and has a headache for 5 minutes. |
| Management    | Management   | *If during this week he has any of those symptoms again, he should just complete that week of rest and then return to play for a total of 7 days off.* |
Analysis of Objective 3: Other Factors

Identify group opinions on:
• Confidence
• Access

Will help identify persons for which greater education is needed to facilitate improved knowledge regarding concussion
Results: Objective 3: **Confidence** in Knowledge of Concussion Management, including RTP Guidelines

A greater % of coaches responded YES.

- Coaches/ATCs: 60 (p<.0001)
- Parents: 40 (p<.0001)

Response Count:
- Yes: Coaches/ATCs = 24, Parents = 7
- No: Coaches/ATCs = 40, Parents = 60
Results: Objective 3: **Access to Educational Materials on Concussion**

- Yes: 64
- No: 39

$p < .0001$

Response Count

- Coaches/ATCs
- Parents

* indicates a significant difference.
Correlations and Associations

Positive correlation between number of concussions identified last year with years of experience ($p = 0.046$), number of types of training programs ($p < 0.001$), factual knowledge score ($p = 0.010$), and total score ($p = 0.008$).

Management score correlated with how recently someone had received concussion education ($p = 0.007$) and number of types of training programs ($p = 0.046$).

A larger percentage of parents are not confident in their ability to identify and manage a concussion compared with coaches.

Conversely, a greater percentage of coaches were confident.
Discussion

1st step in identifying level of knowledge since law passed

Parents’ voice

Recap:

- Level of concussion knowledge overall adequate
- Gaps in knowledge: speaks to need for specific education/outreach targeting deficits

Other factors:

- Experience
- Education recency and type of training program
- Access to educational materials
- Confidence in knowledge of concussion management
Discussion: Other Points to Consider

• Respondents who complete survey may have higher awareness/comfort level

• 2 parent household: 1 fact sheet

• 1 fact sheet is likely inadequate educational means
Conclusions and Recommendations

Actionable items:
  • Address gaps in knowledge and application of knowledge written in specific language
    • Vignettes for parents
  • Access to this material/internet:
    • Plan for community outreach for those groups

Further future studies:
  • Include athletes- part of community
  • Focus future education on intervention of applied knowledge with case scenarios
Thank You

Questions?

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