Implementation of concussion guidelines in community Australian Football and Rugby League– the experiences and challenges faced by coaches and sports trainers

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Implementation of concussion guidelines in community Australian Football and Rugby League – the experiences and challenges faced by coaches and sports trainers.

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Implementation of concussion guidelines in community Australian Football and Rugby League – the experiences and challenges faced by coaches and sports trainers.

Abstract

Objectives:

While guidelines outlining the appropriate management of sport-related concussion have been developed and adapted for use within community sport, it remains unknown how they are experienced by those responsible for implementing them.

Design

Longitudinal study.

Methods:

111 coaches and sports trainers from community-level Australian Football and Rugby League teams completed pre- and post-season surveys assessing their attitudes towards using concussion guidelines. Participants also provided post-season feedback regarding their experiences in using the guidelines.

Results:

71% of participants reported using the guidelines in the preceding season. Post-season attitude was related to pre-season attitude (p=0.002), football code (p=0.015), and team role (p=0.045). An interaction between team role and guideline use (p=0.012) was also found, with coaches who had used the guidelines, and sports trainers who had not, reporting more positive post-season attitudes towards using the concussion guidelines. Implementation challenges included disputing of decisions about return-to-play by players, parents, and coaches, and a perceived lack of time. Recommendations for improved guideline materials included using larger fonts and providing for witnessing of advice given to players.
Conclusions:

This is the first study to examine the implementation of concussion guidelines in community sport. Training of coaches/sports trainers needs enhancement. In addition, new education should be developed for parents/players about the importance of the return-to-play advice given to them by those who follow these guidelines. Information provided by those who attempted to use the guidelines will assist the refinement of implementation, and dissemination processes around concussion guidelines across sports.

Keywords:

Brain concussion; Football; Implementation; Community participation; Concussion guidelines
Introduction

Concussion, a form of mild traumatic brain injury, is associated with a range of symptoms including headache, dizziness, nausea, vomiting and impaired memory. Repeated, subsequent concussions can also lead to longer term adverse health impacts, particularly if the subsequent concussion occurs before the individual has recovered fully from their initial injury. Unfortunately, a large number of sport-related concussions occur each year across a range of sports, with recent evidence suggesting that the incidence of sport-related concussions is rising. In a recent population-based study from Victoria, Australia, the number of hospitalizations for sports-related concussions increased by 61% over a nine year period, while a significant increase in the number of reported concussions in the Australian National Rugby League was reported between 1998 and 2010. Furthermore, in elite soccer players, experiencing a concussion increased the risk of sustaining a different subsequent sports injury by up to 70% in the following year, most probably due to altered neurological and cognitive function.

Recognition of the potential longer-term health impacts associated with sustaining single or multiple concussions, and the increasing incidence of this injury in sport, have prompted the development of guidelines outlining how to appropriately recognise and manage sport-related concussions. Unfortunately, the extent to which these guidelines have been formally adopted by team personnel is unknown, although the knowledge, attitudes, and actual behaviours of the personnel working directly with injured players (i.e., coaches, sports trainers, sports medicine support staff) appears to influence how effectively they use these guidelines. Concerns have also been raised about the extent to which the guidelines can be translated to non-elite, community-level sporting contexts. Thus, unless factors that influence the uptake and use of concussion guidelines are addressed from the outset, it is
highly unlikely that these guidelines will be implemented effectively by team personnel, particularly in community sport.\textsuperscript{9, 12, 14}

To better understand the factors that influence concussion guideline uptake, recent research has begun to focus on the knowledge and attitudes of the team personnel tasked with implementing concussion guidelines. With respect to knowledge, gaps have been identified with respect to team personnel’s understanding of how to recognise concussion symptoms and what actions should be taken following concussions.\textsuperscript{11, 15, 16} For example, a recent study in community-level Australian Football (AF) and Rugby League (RL) found that fewer than half of the surveyed sports trainers and coaches recognised the increased risk of subsequent concussion following the initial episode of concussion, and <25% realised that younger players are at greater risk of concussion.\textsuperscript{11} In an earlier Australian study in Rugby Union, there was little evidence of awareness of concussion guidelines or appropriate return-to-play procedures following concussion.\textsuperscript{17}

While knowledge gaps are often identified, attitudes towards concussion guidelines tend to be positive, at least among those anticipating using concussion guidelines in the coming season.\textsuperscript{10} What remains unclear, however, is whether attitudes towards concussion guidelines change over time once team personnel have actually had a chance to use them. A negative experience with using the guidelines, for instance, could reduce the likelihood that the guidelines would be utilised in future instances, especially if they are perceived as being difficult to implement or not relevant to the specific sporting context in which they are being applied.

The aims of this study were therefore to: i) describe the experiences of, and challenges encountered by, coaches and sports trainers who attempted to use concussion guidelines over a playing season in community football.; and ii) identify factors associated with more favourable post-season attitudes towards the concussion guidelines. These results provide
insights into how the guidelines could be improved to ensure their wider adoption in community sport settings.

Methods

Individuals were eligible to participate in this longitudinal study if they were aged 18+ years and registered as a coach or sports trainer at a community AF or RL club in Australia. To be included in the data reported in this paper, participants must have completed the nationwide baseline (pre-season) survey, which has been previously described. In total, 617 community AF and RL coaches and sports trainers completed the baseline survey at the start of the 2012 playing season out of an eligible national population of approximately 100,000 community AF and RL coaches. At baseline, the survey respondents were invited to provide their contact details so that they could be recontacted at the end of the season to report their actual use of the concussion guidelines (3rd Concussion Consensus Statement). After the 2012 playing season, an email invitation to complete an online post-season survey was sent to everyone who had provided their consent to be contacted (n=510). The time between the pre-season and post-season survey was 26 weeks. Of these, 111 AF and RL coaches and sports trainers completed the follow-up (post-season) survey, representing a follow-up response rate of 22.0%.

Both baseline and follow-up surveys were administered via Qualtrics, an online survey platform. Completion of the online survey(s) was taken as indication of informed consent. Consistent with the baseline survey, the semi-structured follow-up survey (which included a combination of multiple choice and open-answer questions) contained items measuring the central theory of planned behaviour constructs (i.e., intention, attitude, subjective norm, self-efficacy) as well as an extension to this theoretical framework (i.e., personal norm). However, as reflected in our aims, only results pertaining to the attitude construct are reported in the main body of this paper. Results pertaining to the other constructs of theory...
of planned behaviour (intention, subjective norm, self-efficacy and personal norm) are contained in a supplementary file (Appendix A). For both surveys, attitude was assessed using nine items scored on 7-point Likert scales ranging from strongly disagree (1) to strongly agree (7). Items were summed to form an overall attitude scale that could theoretically range from 7 to 63, with higher scores indicating a more positive attitude towards using the concussion guidelines. At follow-up, respondents were also asked whether they had used the concussion guidelines during the current, recently completed season and, if so, were asked to complete open-ended questions seeking additional feedback about: (i) how they had used the guidelines; (ii) any problems experienced in using the guidelines or how they could be improved; and (iii) elements about the guidelines that were found to be useful.

Statistical analyses were conducted using SPSS version 21.0. For the first study aim, participants’ qualitative feedback about using the guidelines were coded into common themes relating to experiences when implementing the guidelines and the difficulties and positive aspects of using the guidelines. Thematic codes were generated by one reviewer (JK) where a set of procedures was followed using an inductive identification of themes. Once codes were generated, response data was allocated to each code by the same reviewer (JK). A second reviewer (PW) then independently allocated each response to the same codes. Any disagreements in code generation or allocation were resolved by a third reviewer (JN). For the second study aim, analysis of co-variance (ANCOVA) was conducted to explore the factors associated with post-season attitudes to the guidelines (dependent variable), after confirming data normality assumptions. The independent variables were use of the guidelines during the preceding season (as reported at baseline), football code (AF vs. RL), and team role (coach vs. trainer), with the pre-season attitude score acting as a covariate. First order interactions between the independent variables were also analysed.

Ethics approval for this study was obtained through the Monash University Human Research Ethics Committee (number HREC CF12/1178 – 2012000575).
Results

Of the 111 respondents who completed both the baseline and follow-up surveys, 79 (71%) reported using the guidelines during the intervening AF and RL season. Table 1 reports the themes identified and common responses, and shows that amongst the 79 respondents who had used the concussion guidelines during the season between the baseline and follow-up surveys, the implementation experiences were generally similar across team roles and sporting codes. Implementation challenges included disputing of decisions about return-to-play by players, parents, and coaches, and a perceived lack of time. Recommendations for improved guideline materials included using larger fonts and providing for witnessing of advice given to players.

Pre- and post-season attitude scores (mean and 95% confidence intervals) for sports trainers and coaches are shown in Figure 1. Post-season attitudes towards using the concussion guidelines were significantly predicted by pre-season attitude ($F(1,64) = 10.68$, $p=0.002$), sporting code ($F(1,64) = 6.19$, $p=0.015$), and team role ($F(1,64) = 4.17$, $p=0.045$). Thus, post-season attitude scores were higher among those: (i) with more positive (i.e. higher) pre-season attitude scores; (ii) associated with AF (as opposed to RL); and (iii) who were a sports trainer (as opposed to a coach). There was also a significant guideline use by team role interaction effect ($F(1,64) = 6.73$, $p=0.012$), indicating a different effect of attitude on guideline usage between coaches and trainers. Specifically, sports trainers had a more positive post-season attitude towards the guidelines if they had not used the guidelines during that season, whereas coaches had a more positive attitude towards the guidelines if they had used the guidelines during the season (Figure 1).

Discussion:

Insert Figure 1 about here.
To our knowledge, this is the first study to examine post-season attitudes towards sports concussion guidelines amongst team-based staff with the responsibility for ensuring that concussion guidelines are followed. In so doing, it provides critical evidence that could be leveraged to encourage the continued use of these guidelines within community-level sport, particularly AF and RL. After all, coaches and sports trainers are unlikely to be enthusiastic adopters of concussion guidelines if their previous attempts at using them had been negative.

Responses to the open-ended questions provided novel insights into potential barriers towards the use of concussion guidelines in community sporting contexts in Australia. A number of participants, for example, spoke of time constraints when using the guidelines. Many coaches and sports trainers also mentioned the pressure they felt from players and parents to allow premature return to play. A lack of support from some coaching staff in keeping affected players off the field was also cited as a potential barrier to guideline usage by sports trainers. In addition, some trainers suggested that the attitudes of coaches may be a barrier to effective implementation of the guidelines. These issues have the potential to create a negative experience for those using the guidelines, thereby reducing the likelihood that they would use the guidelines again. Appropriate measures should therefore be put in place to provide adequate support to those using concussion guidelines in community-level sporting teams. One approach would be to develop programs aimed at educating team support staff, players, and parents about the importance of adhering to the guidelines without challenging the legitimacy of their use or the person tasked with implementing the guidelines.

Several suggestions were provided for improvements to the actual design of the guideline materials to facilitate their implementation in community sporting contexts. For instance, increasing the size of the font in which information on the guidelines is presented could make it easier for older people to read and understand the guidelines on the sideline. Similarly, providing a specific section on reporting forms for return-to-play decisions to be
witnessed could remove ambiguity about the nature and intent of those decisions, should they be disputed by parents or players at a later time.

A key finding from our study was that higher post-season attitudes towards the guidelines were reported by coaches who had used the guidelines and sports trainers who had not used the guidelines during the preceding session. This was after adjustment for other significant factors, such as pre-season attitude score, football code, and the team role of the respondent. These results are likely to reflect the different role that coaches and sports trainers have within the context of community team sport, as well as the training they receive in relation to concussion. While coaches oversee game and training activities and contribute to decisions about when players are able to return to play after injury, they are not generally involved in assessing symptoms of concussion or evaluating the nature and extent of player injuries. Thus, it is likely that their training would not include many of the aspects inherent in the concussion guidelines, which essentially cover concussion recognition and treatment management. This could explain why their attitudes towards the guidelines improved after they had been directly exposed to their use during a playing season. In contrast, sports trainers have the major role of recognising and assessing player injuries, managing first aid, and referring players for medical treatment. Their training would include coverage of concussion principles and they would be more likely to see a role for themselves in implementing concussion management guidelines at the start of a season. They could be expected to be less positive about concussion guidelines, however, if they have tried to implement them but found difficulties when attempting to do so.

Increasingly, it is being recognised that successful sports injury prevention requires not only the development of evidence-based guidelines outlining appropriate management practices but also the formulation of strategies aimed at maximising the dissemination and implementation of these guidelines among target populations. For example, in 2013, the AFL developed guidelines written specifically for players and parents. These guidelines are aimed at educating players and parents about the importance of adhering to the
guidelines and promoting a shared responsibility for managing concussion between the athlete, coach/sports trainer, parents and medical doctor. Despite this, there are few examples of how to effectively implement injury prevention guidelines in community sport.\textsuperscript{24} Moreover, effective injury prevention in community sport requires the implementation of a range of complementary and supportive activities across all levels of the sports delivery setting.\textsuperscript{24, 25} Implementation of, and adherence to, injury prevention initiatives such as the concussion guidelines remains a challenge for all community level sport in the absence of consideration of these influences.\textsuperscript{9} This can only be addressed through the development of programs/interventions that are specifically tailored to the end-user group\textsuperscript{26} together with appropriately targeted strategies to support the delivery of such programs/interventions.\textsuperscript{12, 27}

As with all research, several limitations were associated with this study. Only 22\% of those who agreed to complete the follow-up survey actually completed it. As such, the study findings may not accurately reflect the broader group of AF and RL coaches and sports trainers charged with using the concussion guidelines in community football, leading to response bias in our findings. It is likely that the group of respondents are likely to be more compliant and adherent to the use of guidelines than the broader population of coaches and sports trainers. The sample size of this study also precluded the analyses of attitudes between coaches and trainers separately. Future studies with larger samples may identify additional associations between guidelines usage and other factors for each group. In addition, coaches and trainers were not asked how many times they used the concussion guidelines. Variations in the use of the guidelines may have impacted on positive or negative attitudes towards their use. Finally, no RL respondents offered responses to the open ended questions regarding positive experiences. It is unclear whether they had no positive experiences or were less likely to report them. This requires evaluation in new studies. Future studies would provide valuable insights into factors that, if targeted, may improve the effectiveness of the implementation of concussion guidelines.

\textbf{Conclusion}
In conclusion, this study found that post-season attitudes towards the use of concussion
guidelines among community-level AF and RL coaches and sports trainers varies across
football code and according to direct exposure to their use during the preceding playing
season. The study also identified potential barriers to the use of current concussion
management guidelines, and provided some suggestions for how to improve the packaging
of such guidelines to ensure their increased adoption in community sport settings.
Collectively, these findings suggest that the sustained implementation of concussion
guidelines may not be achieved if these guidelines are associated with poorly designed
materials or do not address potential barriers to their use.

Practical Implications:

- Attitudes towards the concussion guidelines in community-level Australian Football
  and Rugby League varied between coaches and trainers, and between football
codes.

- There are many barriers to the effective use of the concussion guidelines in
  community football.

- Education for coaches and trainers within community football needs to be tailored to
  the football code, and the personnel if the concussion guidelines are to be
  implemented in a sustained and effective way.

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References:


Table 1: Implementation experiences and challenges experienced by Australian Football and Rugby League coaches and sports trainers. Common themes are listed below the table, with the number of participants identifying each theme reported.

<table>
<thead>
<tr>
<th>Team role</th>
<th>Situations in which the guidelines were attempted to be implemented and adopted implementation strategies</th>
<th>Implementation difficulties</th>
<th>Positive experiences with the guidelines and their implementation</th>
</tr>
</thead>
</table>
| AF Coach (n=19) | • Used to inform decision to remove players from field \(^1\)  
                      • Used to inform when players could return to play \(^2\)  
                      • Used to enable referral to medical practitioner \(^4\) | • Not having SCAT cards \(^9\)  
                      • Parents disputing decisions made by coaches \(^8\)  
                      • Most reported no problems | • Clear and concise \(^{16}\)  
                      • Simple \(^{16}\)  
                      • Able to give to players and parents to help justify decision making \(^{17}\) |
| AF Sports Trainer (n=30) | • Used SCAT2 guidelines \(^7\)  
                        • Used to change club policy to follow Australian Football League guidelines \(^6\)  
                        • Ensured laminated copy of | • Parents and players resisting the decisions made \(^6\)  
                      • Players resisted the implementation of guidelines during the game \(^8\)  
                      • Small font on guidelines was hard for | • Simple \(^{16}\)  
                      • Clear and concise \(^{16}\)  
                      • Brief \(^{16}\)  
                      • Provides “clear direction”, “framework”, “guidelines”, |
<table>
<thead>
<tr>
<th>RL Coach (n=17)</th>
<th>RL Sports</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Used to inform decision to remove players from field&lt;sup&gt;1&lt;/sup&gt;</td>
<td>• Used to inform decisions to remove players from field&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>• Used to inform when players could return to play&lt;sup&gt;2&lt;/sup&gt;</td>
<td>• Difficult being the person making the decision; would help to have someone with higher qualifications at the game&lt;sup&gt;14&lt;/sup&gt;</td>
</tr>
<tr>
<td>• Used to inform junior players and parents about when to return to play&lt;sup&gt;3&lt;/sup&gt;</td>
<td>• Needs a box for a witness to sign when you have made a decision to remove player so player cannot question your decision later on&lt;sup&gt;15&lt;/sup&gt;</td>
</tr>
<tr>
<td>• Used to educate players and club officials&lt;sup&gt;5&lt;/sup&gt;</td>
<td>• Trying to decide if a “head-knock” is</td>
</tr>
<tr>
<td></td>
<td>• None given</td>
</tr>
</tbody>
</table>
Trainer (n=13) players from field<sup>1</sup> actually a concussion<sup>11</sup>

- Used to inform when players could return to play<sup>2</sup>
- Trying to decide if a cut to the head is a concussion<sup>11</sup>
- Used to inform junior players and parents about when to return to play<sup>3</sup>
- Players refusing to answer questions after a head-knock<sup>12</sup>
- Used to refer to medical help<sup>4</sup>
- Players refusing to leave field after a head-knock<sup>12</sup>
- Used to ask doctor when safe for a player to return to play<sup>4</sup>
- Parents not understanding seriousness of concussion and not supporting the decision<sup>13</sup>
- Coaching staff not supporting decision and letting player back onto field<sup>13</sup>

AF = Australian Football; RL = Rugby League; SCAT2 = Sport concussion assessment tool 2.

Themes identified

<sup>1</sup> Inform decision making regarding player removal from game n=18

<sup>2</sup> Inform decision making regarding player return to play n=10
3 Inform parents and junior players about decision making n=1

4 Inform when appropriate to refer to medical practitioner n=11

5 Education tool for club officials and players n=7

6 Used to change club policy n=2

7 Practical strategies used n=4

8 Parents and players resisting decisions made n=8

9 Not having resources available n=3

10 Practical issues such as small font n=2

11 Difficulty in deciding if injury was concussion n=4

12 Player refusing to co-operate when concussed n=1

13 Lack of support from players, coaches, parents n=9

14 Feeling insecure about qualifications to make decisions n=5

15 Concerns regarding need for written documentation of decisions made n=1
Guidelines were clear, concise and simple n=27

Provides framework to justify decision making n=18
Figure Legends

Figure 1. Relationship between mean post-season attitudes towards concussion guidelines and experience in using them in the intervening season in coaches and sports trainers from Australian football and Rugby League (sports combined).
Figure(s)
Figure(s)

Bar chart showing mean post-season attitude score for sports trainers and coaches who did not use guidelines in intervening season compared to those who did. The chart indicates a higher mean score for those who did use guidelines in the intervening season.