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Injury surveillance in community sport: Can we obtain valid data from sports trainers?

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Running head: Can we obtain valid data from sports trainers?

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ABSTRACT

A lack of available injury data on community sports participants has hampered the development of informed preventive strategies for the broad-base of sports participation. In community sports settings, sports trainers or first-aiders are well-placed to carry out injury surveillance but few studies have evaluated their ability to do so. The aim of this study was to investigate the reporting rate and completeness of sports trainers’ injury records and agreement between sports trainers’ and players’ reports of injury in community Australian football. Throughout the football season, one sports trainer from each of four clubs recorded players’ injuries. To validate these data, we collected self-reported injury data from players via short message service (SMS). In total, 210 discrete injuries were recorded for 139 players, 21% by sports trainers only, 59% by players via SMS only, and 21% by both. Completeness of injury records ranged from 95-100%. Agreement between sports trainers and players ranged from $\kappa = 0.32$ (95%CI: 0.27, 0.37) for date of return to football to $\kappa = 1.00$ for activity when injured. Injury data collected by sports trainers may be of adequate quality for providing an understanding of the profile of injuries. However, data are likely to underestimate injury rates and should be interpreted with caution.

KEY WORDS: validity, reliability, epidemiology, methodology
INTRODUCTION

Currently in Australia, 27% of adults and 60% of children participate in organised sport, with most participation taking place within community-based clubs (Australian Bureau of Statistics, 2012a, Australian Bureau of Statistics, 2012b). Although there are important health benefits associated with sport participation, there is also a substantial risk of injury (National Center for Injury Prevention and Control, 2009). Despite the recognition of sports injury as a considerable public health problem (National Center for Injury Prevention and Control, 2009), the lack of available injury data has hampered the development of informed preventive strategies for the broad-base of community participation (Finch, 2012). While hospital and emergency department surveillance systems can provide data on the more serious medical-attention injuries in community sports, they cannot provide the full picture (Mummery et al., 2002). This is because the majority of sports injuries are treated by the athletes themselves, by general practitioners and physiotherapists or receive no treatment at all (Mitchell et al., 2010).

In 1995, an Australian report was commissioned to address the lack of information available on the injury problem across a range of sports settings (Finch et al., 1995). The report highlighted the substantial contextual challenges presented by community sports settings for conducting injury surveillance, such as a lack of resources, a reliance on volunteers and an absence of on-site medical professionals. It was suggested that, in several community sports, club-based personnel such as sports trainers would be well-placed to carry out injury surveillance. In Australia, sports trainers are employed by clubs to provide on-site first aid and acute injury management. To qualify, sports trainers are required to attend courses provided by regulatory bodies, such as Sports Medicine Australia (SMA), on first-aid, taping and injury-management (Donaldson and Finch, 2012). In sports such as Australian football and rugby league, sports trainers are present at most competitions and some training sessions (Zazryn et al., 2004, Casey et al., 2004, Donaldson et al., 2004a).
In Australian community sports settings, sports trainers are now encouraged to routinely record injury data at their clubs using online tools or paper forms (Sheehan, 2011, Ekegren et al., 2012). It is anticipated that de-identified data captured via online tools, such as SMA’s Sports Injury Tracker (Sports Medicine Australia, 2012b), could eventually be used to inform and evaluate wide-scale injury prevention strategies for community sport (Sheehan, 2011). Before this happens, there is a need to investigate the accuracy of the data recorded by sports trainers. The aims of this study were to determine: a) the proportion of injuries reported by sports trainers compared to self-report by players; b) the completeness of the data recorded by sports trainers; and c) the agreement between the profiles of injury data recorded by sports trainers and player self-report.

**MATERIALS AND METHODS**

**Study population**

The study was conducted in community Australian football and formed part of a larger injury prevention project entitled ‘National Guidance for Australian Football Partnerships and Safety’ (NoGAPS) (Finch et al., 2011). Australian football is a fast moving team-sport, characterised by physical contests between players, kicking, handballing and running (Australian Football League, 2010). There is a high frequency and rate of injury across all levels of the sport (Cassell et al., 2012, Finch et al., 2013). At the community level, the sport is played from March to September with matches played over 16-18 rounds.

Four community Australian football clubs in Victoria were randomly selected from a pool of 22 clubs concurrently enrolled in the NoGAPS project. Clubs were drawn from different arms of the parent project ensuring that they came from a mix of urban and rural settings across a wide geographical area. They ranged in size from 67-112 players and covered a range of competition levels. Prior to the
start of the football season, the research team contacted each club’s current sports trainer via email
and/or phone to request their involvement in the study. Sports trainers were asked to record
players’ injuries throughout the football season using an online injury surveillance program, Sports
Injury Tracker. In three out of four clubs, the sports trainer agreed to do this. At the remaining club,
a team of sports trainers collected the information using an identical paper-based version of the
program (see Supporting Information) (Sports Medicine Australia, 2012a) and then the information
was uploaded to the online program by the club’s senior coach. The coach felt this would be a more
feasible way to record injuries and in the interests of optimising utility, the alternate method was
approved. The data recorders had 1-6 years of experience at their respective clubs.

Players received information about the study from the research team at training sessions prior to
the start of the football season and were given the opportunity to ask questions before providing
informed consent. Players were included if they were male, aged 18+ years and had no extended
absences from football planned throughout the season. Ethics approval was received from the
Monash University Human Research Ethics Committee (approval no. CF12/0398 – 2012000169).

**Procedures**

Throughout the football season (16-18 rounds), consenting players were required to report any
injuries fitting the injury definition to their club’s sports trainer. The definition of injury was “any
new football-related injury” and only injuries that had been sustained during football training
sessions or matches were recorded. The definition of injury was kept deliberately broad to provide
an opportunity to evaluate the feasibility of recording different types of injuries. Data recorders
were asked to log into Sports Injury Tracker on a weekly basis to record any new injuries occurring in
the last seven days. None of the data recorders had ever used Sports Injury Tracker before so each
of them received verbal instructions either in-person or over the phone on how to use the system
and were also provided with a detailed user-manual. They were given the opportunity to receive
additional follow-up assistance with the system throughout the season although ultimately it was not required. All injury variables recorded in Sports Injury Tracker are shown in Table 1. The coding scheme for each variable within Sports Injury Tracker was developed from the Australian Sports Injury Data Dictionary (ASIDD) (Australian Sports Injury Data Working Party, 1998). Within Sports Injury Tracker, mild injuries were classified as leading to 1-7 days modified activity, moderate leading to 8-21 days modified activity and severe injuries leading to >21 days modified or lost (see Supporting information). If any diagnostic or prognostic information was unavailable at the time of injury, trainers were instructed to revise their injury reports once the information was obtained.

To validate the injury data recorded by sports trainers, we obtained self-reported injury data from players via short message service (SMS). After providing consent, players provided their mobile phone numbers and preferred days and times for receiving messages. One to two days after each match, players received a message on their personal mobile phones reading “Please reply ‘yes’ or ‘no’ indicating whether you have experienced a new football injury in the last seven days”. If they did not respond to the message they received two more reminders that week. If a player had sustained an injury, they received an immediate follow-up phone call from the primary author (CLE), a physiotherapist, to discuss the details of their injury. The standardised phone interview, lasting around 10 minutes, was structured according to the variables included in Sports Injury Tracker. Injured players were followed up weekly via SMS to ascertain their date of return to football. Full details of the player SMS reporting is described elsewhere (Ekegren et al., 2014).

While players had agreed to report their injuries to their sports trainer, they were blinded to the fact that this information was being validated against their text message responses. Likewise, sports trainers were blinded to the concurrent text messaging procedures with players.

**Data analysis**

Weekly SMS responses (‘yes’/’no’) were downloaded from the research team’s mobile phone to an
Excel® (Microsoft Office Excel 2010) spreadsheet, as were the injury data from Sports Injury Tracker. All data were then exported to Stata® 12 (StataCorp 2011) for analysis. To compare the proportion of injuries reported by both methods, we calculated the percentage of injuries reported by players only (via SMS), by sports trainers only (via Sports Injury Tracker) and by both. For all injuries recorded by sports trainers in Sports Injury Tracker, the percentage of 'unknown' or missing responses for each injury variable was calculated as an estimate of completeness. We reported the profile of injuries as frequencies for each injury variable. For these variables, we also reported the proportion of each injury type reported by sports trainers. For any injuries that were reported by both players and sports trainers, we calculated the percentage of agreement between sources and the kappa ($\kappa$) co-efficient (+ 95% confidence intervals) for a range of injury variables. A scale proposed by Landis and Koch (1977) was used to interpret the magnitude of agreement for a range of kappa values. To verify that the same injury was being compared between sources, the injury was required to match on body part and date of onset within seven days (Yard, 2009).
RESULTS

Proportion of injuries reported

Of the 316 football players registered at the four clubs, 44% (n=139) agreed to report their injuries to trainers and respond to weekly SMS requests. The mean (SD) age of players was 25 (4) years, ranging from 18 to 38 years. Seventeen players were lost to follow-up over the course of the season; two due to severe injury, 10 due to quitting football and five for unknown reasons. A total of 210 discrete injuries were recorded by both sports trainers and players combined. Seventy-nine per cent of players (n=110) reported at least one injury over the season. In total, 167 injuries were reported by players via SMS (range=30-69 across clubs) and 86 reported by sports trainers (range=9-52 across clubs). The proportion of injuries reported by sports trainers and players are presented in Figure 1 and Table 2.

Completeness of injury records

For the 86 injuries reported by sports trainers, we calculated the proportion of injury records with missing responses. There was one missing response for the following variables: nature of injury, provisional severity assessment and treating person (99% of injury records complete). There were four injuries with an ‘unknown’ date of return to football (95% of injury records complete). All other variables were fully completed for all 86 injuries.

Profile of reported injuries

Table 3 presents the profile of all injuries reported by both sports trainers and players combined (n=210) and the proportion of these injuries that were reported by sports trainers. The vast majority of injuries occurred during matches rather than at training (n=189). Of the 15 training injuries, only
one was reported by sports trainers. Over half of all injuries (n=110) did not result in any missed matches and, of these, only 34% were reported by sports trainers. Of those injuries that led to four or more missed matches (i.e. ‘severe’ injuries) (n=25), 48% were reported by sports trainers. For those injuries requiring attention from a sports trainer (n=193), roughly half required additional medical attention from other health professionals, such as doctors or physiotherapists (n=102). Sports trainers reported a greater proportion of these injuries (56%) than those that received attention from a sports trainer alone (30%).

Sports trainers reported (46%) of injuries caused by a ‘collision with other player or referee’, whereas they only reported 27% of injuries caused by overexertion. Only 29% of bruises/contusions were reported by sports trainers but they reported 58% of fractures. Sports trainers reported a greater proportion of concussions than ankle sprains (50% versus 31%).

<Insert Table 3 about here>

Agreement between sources

Table 4 presents the agreement between sports trainers and players across a range of variables.

There was 100% agreement ($\kappa=1.00$) between sports trainers and players for the activity at the time of injury (match vs. training). For all other variables, the percentage agreement ranged from 35% to 91% with kappa coefficients ranging from 0.32 to 0.90. Using the scale devised by Landis and Koch (1977) there was ‘almost perfect’ agreement ($\kappa=0.81-1.00$) for the following variables: date of injury, activity at time of injury and body region injured. There was ‘moderate’ agreement ($\kappa=0.41-0.60$) for nature of injury and the provisional severity assessment. There was ‘fair’ agreement ($\kappa=0.21-0.40$) for the mechanism of injury and the date of return to football.
DISCUSSION

The aims of this study were to investigate the proportion of injuries reported by sports trainers in community Australian football compared to self-report by players, the completeness of trainers’ injury records and the agreement between injury data recorded by sports trainers and player self-report.

Despite the perception that sports trainers are well placed to collect injury data in community sport (Finch et al., 1995), few studies have evaluated the performance of these individuals for this purpose. Overall, a lower proportion of all injuries was reported by sports trainers than by players (41% versus 80% of injuries). However, there were differences between clubs, with the sports trainer at Club 3 (Table 2) actually reporting a higher percentage of injuries (71%) than reported by players (58%) and the sports trainer at Club 1 reporting a far lower percentage of injuries (18%) than reported by players (91%). At the latter club, sports trainers collected injury data on paper forms and the coach uploaded the data to the online version of Sports Injury Tracker. It is possible that having multiple people involved led to some injuries being missed and therefore, it is recommended that this
arrangement be avoided in future. Other than this, it is not clear why such substantial differences existed across clubs. None of the sports trainers received any additional training in the use of the reporting system. However, as is often the case in community sport, it is likely that there were differences between sports trainers at each club in terms of their knowledge and experience, their diligence and motivation in reporting injuries and their availability for such activities (Finch and Hennessy, 2000, Donaldson and Finch, 2012, Donaldson et al., 2012). It is concerning that so many injuries were not reported by sports trainers as this has significant implications for obtaining accurate injury rates. As evident from our medical attention data in Table 3 (showing that trainers attended to the majority of injuries), the issue was not that trainers were unaware of the injuries occurring, but rather that they did not report them. It is recommended that, in future, sports trainers should be vetted for their involvement in injury surveillance, based on their knowledge, motivation and availability and that procedures be put in place making it easier for sports trainers to follow injury recording guidelines.

To provide an indication of whether any variables were difficult for trainers to complete, we calculated the proportion of injury cases for which responses were missing or coded as ‘unknown’. For the majority of variables in Sports Injury Tracker there were complete responses for 99-100% of injury cases. The only variable with a lower level of completeness (95%) was ‘date of return to football’, with four cases coded as ‘unknown’. It is understandable that this variable was not always completed as injury reports are usually filled out shortly after the injury occurs when the prognosis may still be unclear. Nonetheless, there was a high level of completeness overall which suggests that the variables and response categories included within Sports Injury Tracker are appropriate for its target users.

The profile of injuries reported by both sports trainers and players was consistent with previous studies in adult community Australian footballers (Shawdon and Brukner, 1994, Gabbe et al., 2002, McManus et al., 2004, Braham et al., 2004, Finch et al., 2013). As per our findings, more injuries
have previously been reported to occur during matches than at training (Gabbe et al., 2002, Braham et al., 2004). Also, collisions (or contact) were the primary mechanisms in all previous studies in this population (Shawdon and Brukner, 1994, Gabbe et al., 2002, Braham et al., 2004, McManus et al., 2004, Finch et al., 2013). The most common natures of injury were muscular strains (Gabbe et al., 2002, McManus et al., 2004, Finch et al., 2013), fractures (Shawdon and Brukner, 1994) and, consistent with the findings of this study, bruises or soft tissue injuries (Braham et al., 2004). Finally, across all studies, the lower limb was the most commonly injured body region (Shawdon and Brukner, 1994, Gabbe et al., 2002, Braham et al., 2004, McManus et al., 2004, Finch et al., 2013).

The similarity of injury profiles reported between this study and previous studies, suggests that data collected by sports trainers within community clubs may be of adequate quality for providing a general understanding of the profile of injuries.

There was an association between the type of injury and whether or not it was reported by sports trainers. For example, sports trainers reported a higher proportion of severe than mild injuries, including those leading to four or more missed matches, those requiring treatment from an external health professional and those caused by collisions (rather than by overuse or overexertion). This is consistent with previous studies, in which a greater proportion of the most severe injuries were reported by both club personnel and athletes (Junge and Dvorak, 2000, Nilstad et al., 2012). Sports trainers also reported far fewer training than match injuries. While previous research has shown that, in Australian football, there are less training than match injuries
overall (Gabbe et al., 2002, Braham et al., 2004), the numbers were much lower than expected. Given that sports trainers are less likely to be present at training than matches (Donaldson et al., 2004b, Casey et al., 2004), it is possible that inadequate staffing prevented sports trainers from being able to record injuries at training. Another possibility is that the majority of training injuries were not severe enough to reach the threshold of reporting. These factors may have implications for decisions about the optimal injury definition for community sport, with injuries sustained during matches and those requiring medical attention and time-loss being more reliably reported by sports trainers.

Between sports trainers and players there was some disagreement on the severity assessment and on the date of return to football. These variables require knowledge of the prognosis of the injury which is often only resolved several days or weeks after the initial injury. In this situation, sports trainers were expected to update the injury record at a later date but evidently, this was not always achieved. Fortunately, match reports published online provided an accurate secondary source of data for determining the date of return to football. There was also disagreement on injury mechanism. This may be attributable to sports trainers being unable to observe the injury occurring. Alternatively, either the trainers or the follow-up interviewer may not have obtained a sufficiently detailed description from players. There was also disagreement on the nature of injury in some cases. This may have been related to incorrect diagnosis by trainers or the follow-up interviewer. However, it is also possible that these diagnostic disagreements arose because assessments were completed at different time points. Sports trainers usually provided an injury diagnosis shortly after the injury
occurred whereas phone interviews often took place up to a week later, during which time the injury
symptoms might have changed.

Only one previous study has evaluated the ability of sports trainers to collect injury data. Braham et
al (2003) assessed sports trainers’ two-week recall of their injury reports but did not evaluate the
accuracy or reliability of their reports. Several other studies in community sport settings, including
adolescent soccer (Emery et al., 2005, Schiff et al., 2010) and adult Australian football (Gabbe et al.,
2002, Braham and Finch, 2004, Twomey et al., 2011), have evaluated some aspect of their injury
surveillance methods. However, none of these studies relied on sports trainers alone to collect injury
data. Instead they used health-care professionals (e.g. doctors, physiotherapists and athletic trainers)
(Gabbe et al., 2002, Emery et al., 2005, Schiff et al., 2010), paid data collectors (mainly sports science
students) (Twomey et al., 2011) or club-based volunteers, including parents (Braham and Finch,
2004, Emery et al., 2005, Schiff et al., 2010), coaches (Emery et al., 2005), team managers (Braham
and Finch, 2004) or club presidents (Braham and Finch, 2004). High injury capture rates were
reportedly achieved by health-care professionals (Gabbe et al., 2002), parents (Emery et al., 2005,
Schiff et al., 2010) and coaches (Emery et al., 2005, Schiff et al., 2010). A shortage of health care
professionals and consistent volunteers is a well-cited barrier to sports safety activities in community
sports settings and it would be unfeasible to rely on such individuals for ongoing surveillance (Finch
and Hennessy, 2000, Zazryn et al., 2004, Casey et al., 2004, Donaldson et al., 2012). Furthermore,
while parents and coaches may be able to capture a high number of injuries, their ability to provide
detailed injury data is likely to be limited due to a lack of specific medical knowledge. It is possible
that having a combination of personnel to share the responsibility of recording may be the most
feasible and reliable option for community sport. For example, injuries could initially be registered
by sports trainers, players or parents and then later diagnosed by a medical professional.

Irrespective of who collects the data, it is likely that that club-based injury reporting within the
context of community sport is, in itself, hard to achieve. Players may underreport injuries to
personnel within their clubs either to avoid missing matches (Nilstad et al., 2012) or because they prefer to consult health professionals external to the club. Also, it has been reported that the nature of community sports clubs is highly dynamic, with staffing and financing changing from one season to the next (Donaldson et al., 2012). Hence, any injury recording procedures put in place at a club are hard to maintain over time. Despite these challenges, there is still a strong argument for conducting club-based injury reporting within community sports. In this study, almost half of all injuries received attention from sports trainers alone and, if reliant only on reports from external treatment sources such as sports medicine clinics and hospitals, these injuries would remain undetected.

There may be limitations affecting the generalisability of our study findings. Firstly, because there is no consensus regarding the definition of injury for Australian football at the non-elite level we decided to use a broad injury definition. However, having a more precise injury definition may have improved the consistency of reporting across clubs and between sports trainers and players. Further to this, our use of the term “any new injury” in the injury definition may have led to a misconception that recurrent injuries should not be reported. In future, if club-based personnel are to be used to collect injury data for research purposes, it is vital that a more objective definition of injury be used.

Another limitation was that we only recruited 44% of all registered players. This was primarily due to the absence of players from training on the night they were recruited (rather than their unwillingness to participate) but it is possible that results may have differed had a more complete sample been represented. Also, our study was conducted with a relatively small sample of clubs. While future research in other sports and with larger samples would be worthwhile, the results do provide a valuable snapshot of the potential variability in injury recording practices across clubs.

In relation to the diagnosis of players’ self-reported injuries, at times it was challenging for the interviewer to elicit sufficient diagnostic information from players over the phone. We did attempt to confirm our diagnoses through contact with treating external health-care practitioners but unfortunately, there
were only nine cases in which this information was accessible, and hence this data source was
subsequently excluded from the study. Finally, there may have been a difference in the proportion
of injuries reported by players and trainers because of the different reporting
methods used. While players had the convenience of reporting their injuries via SMS, trainers were
required to fill out more in-depth forms online. Had there been a consistent reporting method
between trainers and players, they may have been more similarity in their reporting rates. In
future research, it would also be useful to evaluate whether sports trainers have a preference for
electronic or paper-based tools to record injuries and whether this influences data quality.

PERSPECTIVES

This study is the first to investigate the accuracy of injury data recorded by sports trainers in
community sports settings. The profile of injuries reported by sports trainers was consistent with
previous studies and there was a high level of completeness of injury records. However, sports
trainers reported fewer injuries than were reported by players and there was significant
variability across clubs. The types of injuries most likely to be reported by sports trainers
were those occurring during matches, those requiring medical attention and those leading to time-
loss from matches. The level of agreement between sports trainers and self-report by players ranged
from ‘fair’ to ‘almost perfect’ depending on the variable recorded. Those items requiring a greater
degree of diagnostic or prognostic information were most likely to differ. Injury data collected by
sports trainers within community clubs may be of adequate quality for providing a basic
understanding of the profile of injuries, particularly match injuries. However, the data are likely to
underestimate true injury frequencies and therefore should be interpreted with caution.
ACKNOWLEDGMENTS

The authors are grateful to all of the players, club personnel and health-care practitioners who participated in this study, and thank Dr. Alex Donaldson (Centre for Healthy and Safe Sport, University of Ballarat) for his contributions to this study. Thanks also to Professor Jill Cook (Department of Physiotherapy, School of Primary Health Care, Monash University) and Professor David Lloyd (Centre for Musculoskeletal Research, Griffith Health Institute, Griffith University) for their contributions as chief investigators of the NoGAPS research project.
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Table 1. Injury variables recorded in Sports Injury Tracker (Sports Medicine Australia, 2012a)

1. Date of injury
2. Type of activity at time of injury  
   *(e.g. match/training)*
3. Reason for presentation  
   *(e.g. new/recurrent/exacerbated injury)*
4. Mechanism of injury  
   *(e.g. struck by other player/etc.)*
5. Body region injured  
   *(e.g. shoulder/thigh/etc.)*
6. Nature of injury  
   *(e.g. abrasion/fracture/etc.)*
7. Initial treatment  
   *(e.g. none/crutches/etc.)*
8. Action taken  
   *(e.g. immediate return/etc.)*
9. Referral  
   *(e.g. no referral/physio/etc.)*
10. Provisional severity assessment  
    *(mild/moderate/severe)*
11. Treating person  
    *(e.g. Medical practitioner/etc.)*
12. Return to football date
Table 2. Injuries reported by players via SMS, by sports trainers via Sports Injury Tracker and by both (breakdown by club)

<table>
<thead>
<tr>
<th>Club</th>
<th>Total injuries (n)</th>
<th>Injury reported by sports trainers only (%)</th>
<th>Injury reported by players only (via SMS) (%)</th>
<th>Same injury reported by both sports trainers and players (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Club 1*</td>
<td>76</td>
<td>9</td>
<td>82</td>
<td>9</td>
</tr>
<tr>
<td>(3 teams, 54 players)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Club 2</td>
<td>30</td>
<td>13</td>
<td>63</td>
<td>23</td>
</tr>
<tr>
<td>(2 teams, 26 players)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Club 3</td>
<td>73</td>
<td>42</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>(2 teams, 41 players)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Club 4</td>
<td>31</td>
<td>3</td>
<td>71</td>
<td>26</td>
</tr>
<tr>
<td>(2 teams, 18 players)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>210</td>
<td>20.5</td>
<td>59.0</td>
<td>20.5</td>
</tr>
</tbody>
</table>

n=number of injuries; % are proportion of total injuries for each club; *injury data recorded by senior coach at this club
Table 3. Profile of injuries reported by either source and the proportion of these reported by sports trainers

<table>
<thead>
<tr>
<th>Activity at time injury</th>
<th>Total injuries (n)*</th>
<th>Reported by sports trainers (n, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Match</td>
<td>189</td>
<td>81, 43%</td>
</tr>
<tr>
<td>Training</td>
<td>15</td>
<td>1, 7%</td>
</tr>
<tr>
<td>Other (overuse)</td>
<td>5</td>
<td>2, 40%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Severity (time loss)</th>
<th>Total injuries (n)*</th>
<th>Reported by sports trainers (n, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No matches missed</td>
<td>110</td>
<td>37, 34%</td>
</tr>
<tr>
<td>1 match missed</td>
<td>39</td>
<td>20, 52%</td>
</tr>
<tr>
<td>2-3 matches missed</td>
<td>34</td>
<td>16, 47%</td>
</tr>
<tr>
<td>&gt;4 matches missed</td>
<td>25</td>
<td>12, 48%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medical attention</th>
<th>Total injuries (n)*</th>
<th>Reported by sports trainers (n, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports trainer only</td>
<td>91</td>
<td>27, 30%</td>
</tr>
<tr>
<td>Sports trainer + other health professional</td>
<td>102</td>
<td>57, 56%</td>
</tr>
<tr>
<td>None</td>
<td>3</td>
<td>2, 66%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanism of injury</th>
<th>Total injuries (n)*</th>
<th>Reported by sports trainers (n, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collision with other player/referee</td>
<td>79</td>
<td>36, 46%</td>
</tr>
<tr>
<td>Overexertion (e.g. muscle tear)</td>
<td>34</td>
<td>9, 27%</td>
</tr>
<tr>
<td>Overuse</td>
<td>20</td>
<td>8, 40%</td>
</tr>
<tr>
<td>Struck by other player</td>
<td>12</td>
<td>7, 58%</td>
</tr>
<tr>
<td>Twisting to pass or accelerate</td>
<td>12</td>
<td>5, 42%</td>
</tr>
<tr>
<td>Fall from height/awkward landing</td>
<td>11</td>
<td>5, 45%</td>
</tr>
<tr>
<td>Fall/stumble on same level</td>
<td>8</td>
<td>3, 38%</td>
</tr>
<tr>
<td>Struck by ball</td>
<td>8</td>
<td>5, 63%</td>
</tr>
<tr>
<td>Other</td>
<td>27</td>
<td>9, 34%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Body region injured</th>
<th>Total injuries (n)*</th>
<th>Reported by sports trainers (n, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thigh</td>
<td>38</td>
<td>13, 34%</td>
</tr>
<tr>
<td>Knee</td>
<td>30</td>
<td>11, 37%</td>
</tr>
<tr>
<td>Shoulder</td>
<td>25</td>
<td>8, 32%</td>
</tr>
<tr>
<td>Ankle</td>
<td>25</td>
<td>9, 36%</td>
</tr>
<tr>
<td>Lower leg</td>
<td>24</td>
<td>3, 13%</td>
</tr>
<tr>
<td>Hand and fingers</td>
<td>17</td>
<td>9, 53%</td>
</tr>
<tr>
<td>Face (excludes eye)</td>
<td>13</td>
<td>8, 61%</td>
</tr>
<tr>
<td>Head (excludes face)</td>
<td>11</td>
<td>6, 54%</td>
</tr>
<tr>
<td>Lower back</td>
<td>10</td>
<td>6, 60%</td>
</tr>
<tr>
<td>Pelvis</td>
<td>10</td>
<td>6, 60%</td>
</tr>
<tr>
<td>Neck</td>
<td>8</td>
<td>2, 25%</td>
</tr>
</tbody>
</table>
### Nature of injury

<table>
<thead>
<tr>
<th>Nature of Injury</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruise/contusion</td>
<td>64</td>
<td>19.29%</td>
</tr>
<tr>
<td>Strain (e.g. muscle tear)</td>
<td>49</td>
<td>19.39%</td>
</tr>
<tr>
<td>Sprain (e.g. ligament tear)</td>
<td>41</td>
<td>16.40%</td>
</tr>
<tr>
<td>Fracture (including suspected)</td>
<td>17</td>
<td>10.58%</td>
</tr>
<tr>
<td>Inflammation/swelling</td>
<td>15</td>
<td>6.40%</td>
</tr>
<tr>
<td>Dislocation/subluxation</td>
<td>12</td>
<td>4.34%</td>
</tr>
<tr>
<td>Open wound/laceration cut</td>
<td>9</td>
<td>6.66%</td>
</tr>
<tr>
<td>Concussion</td>
<td>8</td>
<td>4.50%</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>6.40%</td>
</tr>
</tbody>
</table>

### Top 3 specific diagnoses

<table>
<thead>
<tr>
<th>Specific Diagnosis</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ankle sprain</td>
<td>16</td>
<td>5.31%</td>
</tr>
<tr>
<td>Hamstring strain</td>
<td>15</td>
<td>6.40%</td>
</tr>
<tr>
<td>Concussion</td>
<td>8</td>
<td>4.50%</td>
</tr>
</tbody>
</table>

### Total injuries

<table>
<thead>
<tr>
<th>Total Injuries</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>210†</td>
<td>86‡, 41%</td>
</tr>
</tbody>
</table>

* where disagreements arose between sources on injury classification (see Table 4), sources of best evidence were used, e.g. disagreements on date of injury and severity were resolved using match records, disagreements on nature of injury were resolved using body part and mechanism variables to determine the most likely correct diagnosis ; † where injury total is <210, data were missing; where injury total is >210, multiple categories were assigned to a single injury; ‡where injury total is <86, data were missing; where injury total is >86, multiple categories were assigned to a single injury.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Percentage agreement between sports trainers and players (n=43 injuries)</th>
<th>Kappa (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of injury</td>
<td>91%</td>
<td>0.90 (0.87,0.95)</td>
</tr>
<tr>
<td>Activity at time of injury</td>
<td>100%</td>
<td>1.00 (1.00,1.00)</td>
</tr>
<tr>
<td>(e.g. match/training)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanism of injury</td>
<td>48%</td>
<td>0.34 (0.25,0.48)</td>
</tr>
<tr>
<td>(E.g. struck by other player/etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body region injured</td>
<td>86%</td>
<td>0.85 (0.84,0.90)</td>
</tr>
<tr>
<td>(E.g. shoulder/thigh/etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature of injury</td>
<td>60%</td>
<td>0.52 (0.44,0.66)</td>
</tr>
<tr>
<td>(E.g. abrasion/fracture/etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provisional severity assessment</td>
<td>70%</td>
<td>0.53 (0.29,0.71)</td>
</tr>
<tr>
<td>(mild/moderate/severe)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return to football date</td>
<td>35%</td>
<td>0.32 (0.27,0.37)</td>
</tr>
</tbody>
</table>
Figure 1. Injuries reported by players via SMS, by sports trainers via Sports Injury Tracker and by both

n=number of injuries; % is proportion of total injuries (n=210)

Figure 1 legend. Figure one shows the proportion of injuries reported by players via SMS, by sports trainers via Sports Injury Tracker and by both. Fifty-nine per cent of the 210 injuries were reported by players via SMS only 20.5% were reported by sports trainers only and 20.5% of injuries were reported by both players and sports trainers.