



Title	Occupational safety and concussion injury awareness of Irish professional and semi-professional footballers
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In recent years, there has been a growth in research examining concussion and injury risk in football, with national football associations and leagues in countries such as the Netherlands and Italy undertaking much needed research. Studies of high-school, university-level and professional football players also now exist in the recent literature. However, the significance of parameters such as player age and professional occupational status remains unclear. Moreover, despite a growth in studies examining concussion-reporting rates and practices with professional rugby players in Ireland, studies examining the occupational risks associated with injury and concussion in particular amongst Irish semi-professional and professional footballers are lacking. Finally, research examining personal safety awareness and attitudes towards safety management amongst professional athletes has been limited. In response, the purpose of this study was to investigate safety awareness and concussion-reporting frequencies of a cohort of Irish professional footballers.

Methodology

Population

The study cohort consisted of professional and semi-professional football players playing in the top two divisions of the League of Ireland, which is run by the Football Association of Ireland (FAI, the governing body for football in the Republic of Ireland). Players may be classified by a number of factors such as age, gender and level of play (youth, university, amateur and professional). Semi-professional football players typically get paid and sign a semi-professional contract but may have other employment. Amateur players, regardless of age or playing level, do not get paid.

At the commencement of the study in March 2015, it was indicated that there was a total of 250 professional (100) and semi-professional (150) footballers registered with the Professional Footballers Association of Ireland (PFAI). All were male and ranged in age from 18 to 39. These footballers had received educational information regarding concussion during the interval between the 2013 and 2014 seasons.

In order to assess occupational safety awareness in League of Ireland footballers, certain inclusion and exclusion criteria were taken into consideration when evaluating the eligibility of potential applicants.

The inclusion criteria were that each participant had to be registered with a League of Ireland football club, in receipt of remuneration for playing for the club, to be a member of the PFAI, and to have played professionally or semi-professionally for at least one season prior to 2014.

Exclusion criteria were that players under 18 years of age, players that had not played professionally prior to the 2014 season and players on loan from non-League of Ireland clubs were excluded from the study.

Survey

A census survey utilising an anonymous questionnaire was considered as the preferred method for obtaining safety awareness and self-reported concussion information. Permission was sought from and granted by the FAI to access their cohort of players to participate in the survey. Ethical exemption was granted by the University College Dublin Human Research Ethics Committee in advance of the study (no vulnerable groups, sensitive topics or conflicts of interest were identified).

The survey was in the format of a questionnaire that was adapted from four appropriate and validated questionnaires identified: the Occupational Safety Climate Questionnaire (1); the Organisational Practices Questionnaire (2); the Questionnaire Measuring Perception of Workplace Safety (3); and the Questionnaire on Occurrence of Concussion and Knowledge in Italian Soccer (4). The latter questionnaire was based on the McCrea et al.'s Standardized Assessment of Concussion (SAC) (5).

Due to population access permission restrictions, no questions were asked regarding; actions or inaction by management or support staff, attitudes towards management or support staff, attitudes towards or actions of peers in relation to safety and concussion or recall of specific concussion symptoms. Players were provided with a definition of concussion and a list of concussive symptoms for reference in answering the questions regarding their reporting. The questionnaire was piloted in advance on eight former professional footballers. Players could choose not to participate as it was entirely voluntary and anonymous and in no way could any individual be subsequently identified from the data gathered. By completing the questionnaire, participants implied consent for their responses to be included in the analysis and subsequent reporting.

Data Collection

Originally, the questionnaire was distributed via the online tool, Survey Monkey, for ease of completion. A link to the survey was emailed to the PFAI administration staff, along with the participant information sheet, in mid-March 2015. The link and participant information sheet were then forwarded to all members of the association. However, after three weeks, the response rate was low, rendering the study infeasible. Consequently, and in recognition of the importance of minimising the period of recall, it was determined that face-to-face distribution of the survey in hardcopy to the participants before training sessions would improve the response rate. Due to time constraints (all data was required to be gathered by mid-June 2015), a convenience sample of willing and available league clubs was utilised to expedite the completion of the data collection process. Hardcopy questionnaires were distributed between April and June 2015 (five months after the conclusion of the 2014 season) at times convenient for the participating clubs. This method of convenience sampling while the most efficient to gain access to as many players as possible in a limited time, is acknowledged as a limitation to this research as discussed later. The questionnaires were filled out prior to training sessions. An additional question was added to hardcopy questionnaires, asking participants to confirm that they had not already completed the questionnaire online. In total, 68 footballers participated online while 81 footballers participated via the hardcopy questionnaire, giving a total of 149 participants and a response rate of 60%.

Statistical Analysis

Descriptive statistics were used to determine the population's demographic profile, playing positions, frequency of concussions reported and reasons for non-reporting. Statistical analysis was conducted using SPSS with Pearson Chi-Square with Yates Correction and Fishers Exact utilised for testing. Odds Ratios (OR) were also reported. Pearson Chi-square was utilised for initial significance testing and this was followed by or checking using a Yates correction and Fishers Exact tests as necessary. Fisher's exact test was used when the chi-square criterion of a minimum cell number of five was not achievable. Any results of $p < 0.05$ at the 95% CI were deemed significant. Some comments were added based on the merit of the 90% CI results in some cases.

Table 1 Player awareness of club safety programme (n = player)

Player Status	Yes		No / Don't Know		Total	P Value	OR (95%CI)
	n	(%)	n	(%)			
Professional	11	(45.8)	39	(38.6)	50	0.52	1.3(0.5-3.3)
Semi-professional	13	(54.2)	62	(61.4)	75		
Total	24	(19.2)	101	(80.8)	125		

Table 2 Player attitudes towards workplace safety practices (n = player)

	Agree		Disagree / No Opinion		Total	P Value	OR(95% CI)
	n	(%)	n	(%)			
I consider my work environment to be dangerous							
Professional	1	(2.0)	49	(98.0)	50	0.066	5.8(0.9-133.3)
Semi-professional	8	(10.7)	67	(89.3)	75		
Total	9	(7.2)	116	(92.8)	125		
I consider my work environment to be safe							
Professional	39	(78.0)	11	(22.0)	50	0.048	2.7(1.0-8.0)
Semi-professional	68	(90.7)	7	(9.3)	75		
Total	107	(85.6)	18	(14.4)	125		
I consider my work environment to be risky							
Professional	9	(18.4)	40	(81.6)	49	0.94	1.0(0.4-2.8)
Semi-professional	12	(16.0)	63	(84.0)	75		
Total	21	(16.9)	103	(83.1)	124		
I consider my work environment to be unsafe							
Professional	1	(2.0)	48	(98.0)	49	0.24	3.4(0.4-83.2)
Semi-professional	5	(6.7)	70	(33.3)	75		
Total	6	(4.8)	118	(95.2)	124		
I could be hurt easily in my workplace							
Professional	20	(40.0)	30	(60.0)	50	0.57	4.0(0.1-591.7)
Semi-professional	20	(26.7)	55	(73.3)	75		
Total	40	(32.0)	85	(68.0)	125		

Table 3 Player attitudes towards fellow player (teammates) safety practices (n = player)

	Agree		Disagree / No Opinion		Total	P Value	OR(95% CI)
	n	(%)	n	(%)			
Teammates ignore the safety rules							
Professional	5	(10.0)	45	(90.0)	50	0.08	4.0(0.8-30.9)
Semi-professional	2	(2.7)	73	(97.3)	75		
Total	7	(7.2)	118	(92.8)	125		
Teammates don't care about safety							
Professional	1	(2.0)	49	(98.0)	50	0.80	1.3(0.1-40.4)
Semi-professional	2	(2.7)	73	(97.3)	75		
Total	3	(85.6)	122	(14.4)	125		
Teammates pay attention to the rules							
Professional	33	(66.0)	17	(34.0)	50	0.70	1.2(0.5-2.5)
Semi-professional	52	(69.3)	23	(30.7)	75		
Total	85	(68.0)	40	(32.0)	125		
Teammates look out for each other							
Professional	41	(83.7)	8	(16.3)	49	0.70	1.2(0.5-3.2)
Semi-professional	61	(81.3)	14	(18.7)	75		
Total	102	(82.3)	22	(17.7)	124		
Teammates take chances							
Professional	6	(40.0)	43	(60.0)	49	0.40	1.5(0.5-4.6)
Semi-professional	13	(26.7)	62	(73.3)	75		
Total	19	(32.0)	105	(68.0)	124		

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Table 4 Player attitudes towards the team management regarding their safety (n = player)

	Agree		Disagree / No Opinion		Total	P Value	OR(95% CI)
	n	(%)	n	(%)			
Team management provides safety training							
Professional	22	(44.0)	28	(56.0)	50	0.20	1.6(0.8-3.4)
Semi-professional	42	(56.0)	33	(44.0)	75		
Total	64	(51.2)	61	(48.8)	125		
Team management provides safety information							
Professional	23	(46.9)	26	(53.1)	49	0.90	1.0(0.5-2.2)
Semi-professional	39	(52.0)	36	(48.0)	75		
Total	62	(85.6)	62	(14.4)	124		
Team management provides safety equipment							
Professional	30	(66.0)	19	(34.0)	49	0.20	1.6(0.7-3.5)
Semi-professional	54	(69.3)	21	(30.7)	75		
Total	84	(68.0)	40	(32.0)	124		
Team management provides safe conditions							
Professional	40	(81.6)	9	(18.4)	49	0.50	1.3(0.5-3.5)
Semi-professional	64	(85.3)	11	(14.7)	75		
Total	104	(83.9)	20	(16.1)	124		
Team managements safety programme prevents accidents							
Professional	40	(81.6)	9	(18.4)	49	0.50	1.3(0.5-3.5)
Semi-professional	64	(85.3)	11	(14.7)	75		
Total	104	(83.9)	20	(16.1)	124		

Table 5 Player recollection of concussion reporting before (2010-2013 seasons) and after (2014 season) concussion symptom information dissemination (n = player)

Player Status	Yes		No		Total	P Value	OR (95% CI)
	n	(%)	n	(%)			
2010-2013 seasons							
Professional	12	(22.2)	42	(77.8)	54	0.70	1.2(0.5-2.9)
Semi-professional	14	(19.2)	59	(80.8)	73		
Total	26	(20.5)	101	(79.5)	127		
2014 season							
Professional	5	(9.3)	49	(90.7)	54	0.80	1.1(0.3-4.1)
Semi-professional	6	(9.0)	67	(91.0)	73		
Total	11	(8.7)	116	(91.3)	127		

Table 6 Concussion symptom reporting 2010-2013 vs 2014 (n = player)

Player Status	2010-13		2014		P Value	OR (95% CI)
	n	(%)	n	(%)		
Yes	26	(20.4)	11	(8.7)	0.007	2.7(1.3-6.0)
No	101	(79.6)	116	(91.3)		
Total	127	(100.0)	127	(100.0)		

Results and Discussion

Research has explored risk management principles in sport, factors underpinning occupational health and safety in sport (6) and aspects of soccer clubs healthy working and living environments (7). However, no research explored personal or team safety awareness in professional sports teams. Considering the majority of footballers that participated in the study did not know if their football club had a safety programme, it is fair to conclude that safety awareness and management of safety information dissemination across League of Ireland football clubs needs to be addressed. Less than one third of those surveyed noted there was a safety programme in their club. No research was readily available on personal or team safety awareness in professional sports teams. It has been noted a lack of safety awareness amongst health care workers and cited the lack of awareness as one of the main reasons health care workers had the highest number of workplace injury claims in Australia in 2012 (8). Generally, the footballers that participated in the study demonstrated a positive attitude towards the management of their safety and acknowledged the role both fellow players and the management team play in managing team safety. There was no significant difference between professional status, which could indicate that while the semi-professional players may have experience of occupational safety and health management in their partner professions, they do not see any major difference in the way the football clubs manage their safety.

Of the 127 players who responded to the questions regarding concussion within this broader study, from the 2014 season after they had received concussion awareness training, 68 reported concussive symptoms to individuals within their support network. Of these 68 players, 20 (15.7%) were officially diagnosed with concussion (9). This figure is considerably higher (>10%) than that of a similar representative study conducted with Italian footballers, which found that 5% of the population had suffered a concussion in the previous season (4).

This research is the first and largest investigation of the self-reported frequency of, and attitudes towards, occupational safety and concussion reporting as a specific injury amongst Irish senior professional and semi-professional footballers. This study has indicated that professional status does not have a significant bearing on the attitudes towards safety management or the likelihood of reporting a concussion. Further research is needed to ascertain whether professional footballers perceive concussion as an occupational risk, and whether they appreciate that accepting such risks can have long-term occupational implications for their health (i.e. that cumulative sporting injuries can potentially lead to debilitating health conditions). As a questionnaire may not be an effective tool for exploring attitudes towards concussion, it has been argued that understanding player views on self-reporting concussion would require qualitative research (10).