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Introduction

- 1 - Recognising and removing players who have experienced a concussive incident is a priority for sports.
- 2 - Player awareness of concussive symptoms, and willingness to report these to medical staff is essential to allow clinical assessments to be undertaken if the concussive incident has not been observed (e.g., during training or match-play).
- 3 - Under-reporting and hiding concussive symptoms has been observed in sports.

Objectives

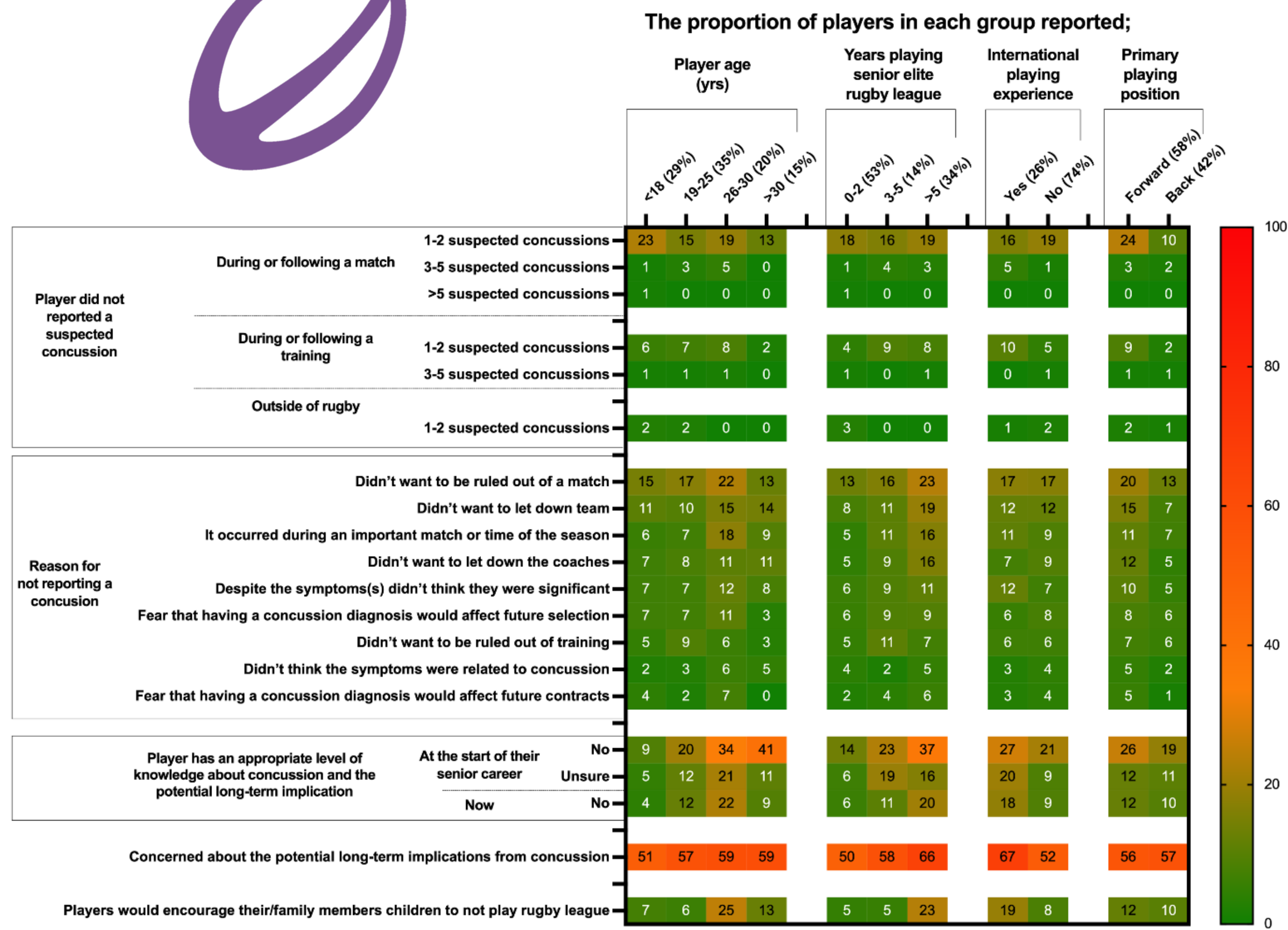
Quantify and identify factors associated with concussion underreporting in elite rugby league players from the Super League.

Methods

During the preseason of the 2022 season, 422 Men’s and Women’s Super League players completed an online anonymous survey quantifying player demographics, rugby playing history, and factors & perceptions associated with concussion.

Results

63% of underreporting events occurred during match HIA’s. The two most common reasons for under-reporting were ‘**didn’t want to be ruled out of a match**’ (35%) and ‘**didn’t want to let down team**’ (24%). Symptoms correctly identified on **74%** of occasions. **65%** had appropriate knowledge at the start. **89%** had appropriate knowledge now. **33%** reported at least one concussion diagnosed in the last 2 seasons. **62%** reported to having annual concussion education at their clubs. **57%** were concerned about the potential long-term implications. **11%** would encourage their/family members children to not play rugby league.



20% of Super League players did not report concussion-related symptoms during the 2020 and 2021 seasons.

Figure 1. Heat map depicting the proportion (%) of players in each category.

Conclusions

The proportion of Super League players who did not report concussion symptoms was similar to rugby league players in Australia. The main reasons for not reporting concussion appeared to be **due to perceptions of what’s beneficial for the team**, suggesting both performance and medical staff should collectively encourage players to report concussion. This is an **individual modifiable risk factor** and should be considered within the concussion management of players.

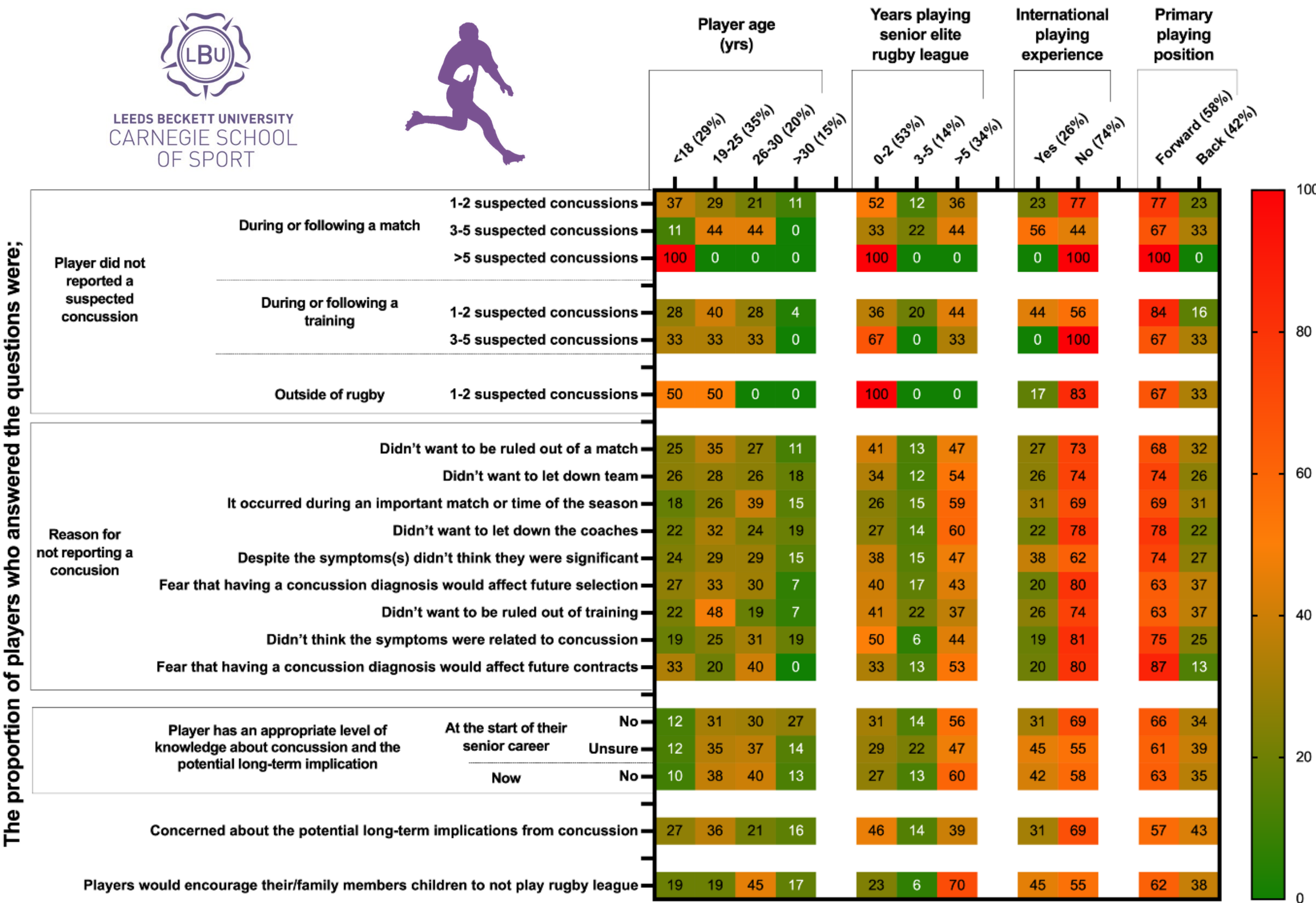


Figure 2. Heat map depicting the proportion (%) of players who responded to questions on not reporting a suspected concussion.

Table 1. Correct, incorrect, and unsure answers for concussion symptom understanding.

Symptom:	Correct	Incorrect	Unsure
Headache	95.8%	3.7%	0.5%
Feeling off balance	94.4%	4.9%	0.7%
Nausea or vomiting	92.4%	6.9%	0.7%
Double vision	90.7%	5.4%	3.9%
Confusion	90.6%	7.2%	2.2%
“Don’t feel right”	90.4%	5.4%	4.2%
Difficulty remembering	90.4%	6.9%	2.7%
Loss of consciousness	89.9%	7.6%	2.5%
Difficulty concentrating	89.2%	6.9%	3.9%
Pressure in the head	89.1%	5.7%	5.2%
Drowsiness	86.7%	8.1%	5.2%
Sensitivity to light	85.0%	7.1%	7.9%
Feeling slowed down	80.8%	6.6%	12.5%
Feeling like “in a fog”	80.4%	7.8%	11.7%
Fatigue or low energy	78.7%	10.8%	10.5%
Neck pain	77.3%	10.3%	12.3%
Weakness/tingling in arms or legs	70.1%	11.0%	18.9%
Sensitivity to noise	69.0%	13.3%	17.7%
Trouble falling asleep	58.2%	17.4%	24.3%
Seizures	58.1%	16.0%	25.9%
Irritability	54.7%	16.8%	28.6%
More emotional	51.8%	19.2%	29.0%
Sadness	47.5%	22.2%	30.3%
Nervous or anxious	44.7%	23.1%	32.2%
Tooth ache*	42.1%	19.2%	38.7%
Single joint pains*	37.8%	18.4%	43.7%
Weight gain*	47.8%	11.1%	41.1%
Mean ± SD	73.5 ± 0.2%	11.1 ± 0.1%	15.4 ± 0.1%

* indicates symptoms not related to concussion

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Competing interest: DT PhD is part-funded by Leeds Rhinos. BJ and KT are employed by Leeds Rhinos in a consultancy capacity. GP and BJ are employed in a consultancy capacity by the Rugby Football League. GP is a contracted Doctor by a SL club. LF is employed by the Rugby Football League and Rugby League World Cup. TL is a contracted Doctor by a NRL club. KS is employed by the Rugby Football Union.

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Contributors: BJ, GP, LF conceptualised the research project. LF distributed the survey for the study. DT, KT, GP, TL, SH, RDJ, JB, KS were responsible for analysis and interpretation of the results. DT drafted the manuscript. All authors critically reviewed and edited the manuscript prior to submission.

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Ethical approval: This project was approved by Leeds Beckett University, Local Ethics Committee (87996).