

**‘Part and parcel of the game’? Physical education teachers, head trauma,
and the Rugby Football Union’s ‘Headcase’ initiative**

Managing Sport and Leisure

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Abstract

Purpose: This article provides an analysis of British physical education (PE) teachers' knowledge of and attitudes toward concussion in rugby.

Methods: Semi-structured interviews were conducted with 15 qualified PE teachers responsible for rugby delivery in their respective schools (and who also hold a minimum of a Level 2 Rugby Football Union (RFU) accredited coaching award, and have completed the organization's concussion awareness training initiative, 'Headcase').

Findings: Due to the absence of appropriate training – both in coaching qualifications and broader teacher training – these teachers lack understanding of signs, symptoms, and aftercare of suspected concussion. Findings also indicate that 'Headcase' may be problematic in providing adequate education to ensure PE teachers are adequately prepared should serious injury arise.

Implications: Given the findings of this research, we recommend: (1) 'Headcase' be delivered by a qualified practitioner or form a central part of existing coaching qualifications; (2) Mandatory tackle training to be provided to PE teachers; (3) Mandatory injury logs to be kept by every school in order to better understand the frequency of injury in PE.

Keywords: concussion, physical education, rugby, teachers, Headcase

Introduction

Injuries have traditionally been an uncritically ‘accepted’ part of sporting culture (Anderson, 2010). But due to various high-profile examples – including the deaths of American footballer Mike Webster and that of 14-year-old schoolboy Benjamin Robinson in Northern Ireland – sport, in recent years, has afforded greater attention to the damaging, long-term effects of injuries, particularly those caused by hard and repeated blows to the head (Renjilian & Grady, 2017; White *et al.*, 2020). Indeed, McCrory *et al.* (2017) recently estimated that approximately 80% of injuries sustained in sport are traumatic head injuries. In rugby, official statistics released by the Rugby Football Union (RFU), rugby union’s governing body in England, show that concussion is classified as the most frequent match injury; Fuller *et al.* (2018) show this to be approximately 12.5% of all injuries at the elite level of the sport.

Defined by McCrory *et al.* (2005, p. 48) as “a complex pathophysiological process affecting the brain induced by traumatic biomechanical forces,” concussions have been identified as the most common form of injury sustained in schools’ rugby (Abernethy & MacAuley, 2003; see also White *et al.*, 2018). In UK physical education (PE), the recording of injuries is not currently required, although PE teachers report rugby to be the most injurious sport under their care. This has led to (so far, unsuccessful) recommendations that full-contact rugby – currently compulsory in many British schools – to be removed from PE (White *et al.*, 2018).

The increase of concussion statistics in rugby in recent years may, of course, be attributable to the increased necessity to report them (Cross *et al.*, 2017), as well as the effect that the professionalisation of rugby has had in developing heavier players (and, thus, greater risk of concussions) (e.g. Hill *et al.*, 2018). These statistics also highlight the importance of ensuring that effective prevention and management education is provided to players, coaches, match officials, parents/guardians, and teachers. The RFU’s introduction of ‘Headcase’ –

their concussion awareness initiative – has attempted to raise awareness of the risk factors with participation in rugby in all contexts. This programme, completed modularly on the RFU’s website, seeks to “increase understanding and provide information on concussion and other related topics, including how to prevent and manage suspected concussions” (RFU, 2019).

Despite the growing concerns for head trauma in sport, however, there remains a relative lack of depth in existing scholarly research on PE practitioners’ perspectives in this area. Building on recent quantitative work on US PE teachers’ knowledge of concussion (Hildenbrand, Richards & Wright, 2018) – and calls for those participating in contact sports to further understand concussions (Rosenbaum & Arnett, 2010) – this article offers a qualitative analysis of British PE teachers’ attitudes to, and knowledge, understanding and experiences of concussion in PE. By conducting 15 semi-structured interviews with secondary school PE teachers in South East England – all of whom hold a minimum of an RFU Level 2 coaching award, and have completed the ‘Headcase’ training initiative – this research shows that these participants have little confidence in the policy, arguing that it fails to provide sufficient knowledge of concussion in rugby. Thus, we conclude by making some recommendations that may improve the overall safety of PE rugby in the UK.

Rugby, PE, and head trauma

For around 150 years, rugby (union and league) has typically been second only to football as the UK’s most participated contact team sport (Sport England, 2017). Across the world it is played in more than 100 countries and is the third most popular team sport globally (Collins *et al.*, 2008). Although not a compulsory component of PE curricular in the UK – at present, no sport is – rugby is still popular in many schools. In 2013, for example, the RFU estimated that it is played in approximately 1500 secondary state schools. While there are many ‘codes’

of rugby in different parts of the world, the principles of each remain relatively simple: retain possession of the ball, evade the opposition, and invade their territory. Defenders seek to prevent this from occurring through tackling, a key – and compulsory – structural element of the sport (White *et al.*, 2018).

Given that rugby is one of the “hardest-hitting” sports, it is unsurprising that the propensity for head injuries is extremely high (King *et al.*, 2014). Indeed, high rates of injury have been documented for professional, amateur, and youth players (Freitag *et al.*, 2015; Kirkwood *et al.*, 2015; Viliers *et al.*, 2018). Problematically, however, there have been grave concerns regarding the underreporting of concussion among rugby players. Research on elite Irish rugby players revealed that 44% of under-20 players failed to report their injury to medical staff (Baker *et al.*, 2014). Fraas *et al.* (2014) show this figure to be 53.4% in their research on elite players.

Motivations for leaving concussions unreported to medical staff are many: including, (1) perceptions of a lack of severity; (2) wanting to remain in a game or training; (3) not wanting to let teammates or coaches down; (4) a lack of education and awareness of concussive symptoms (Fraas *et al.* 2014; McCrea *et al.* 2004; Malcolm, 2016; Register-Mihalik *et al.*, 2013). More recently, Sanderson *et al.* (2017) apply a gendered lens, and show that while male athletes are more likely to avoid reporting a concussion – primarily due to team allegiance – female athletes fail to report concussion due to the “pain principle,” a perceived lack of severity, and a lack of resources to treat concussion (in comparison to men’s sport). In the rugby context, Liston *et al.* (2018) suggest that the culture values of sport, including playing through pain or being “head-strong,” are privileged over the health of participants. Malcolm (2009) found that even medical staff, who are bound by the hypocritical oath, also put the needs of the sport over the needs of the athletes who are at risk of harm.

Broglia and Puetz (2008) found that athletes who do report concussive symptoms often delay doing so until up to two weeks later, increasing the risk of longer-term health issues, such as post-concussion syndrome, which refers to the symptoms a person can suffer for a significant period of time after sustaining a concussion. Results in this area also document concerning findings—especially in youth sport. For instance, Freitag *et al.* (2015) show that around 12% of youth rugby players sustain injuries serious enough to warrant a week's absence from the sport, while Archbold *et al.* (2017) show that, in Northern Irish schools rugby, one-in-five reported injuries is a concussion.

Research is also generally consistent in showing that the majority of these injuries are caused by tackles (McCrory *et al.*, 2017; Quarrie & Hopkins, 2008)—and is responsible for two-thirds of all head injuries and three-quarters of concussions (Roberts *et al.*, 2017; Tucker *et al.*, 2016). Collins *et al.*'s (2008) research on boys' and girls' youth rugby in high school US rugby, for instance, showed that one-in-five injuries were head injuries—and most were concussions. Moreover, they also showed that over two-thirds of concussions were caused by or associated with the tackle. Elsewhere, McIntosh *et al.* (2010) show that tackle-related injuries to the head, face, and neck were consistently evident among all age-groups—under-13 (50%), under-15 (53%) under-18 (45%), and under-20 (49%).

While awareness training has been more readily available in recent years (e.g. LaRoche *et al.*, 2016; Moser & Schatz, 2017), findings in this area remain troubling—especially when one considers that tackling is a compulsory part of rugby upward of age nine. Research in the US has sought to develop a scale for measuring knowledge of and attitudes toward concussion among athletes (Rosenbaum & Arnett, 2010). Yet while PE teachers are provided with training, their knowledge was not absolute, and this had little bearing on their teaching style (Hildenbrand, Richards & Wright, 2018). With this in mind, and to remove the short-term, long-term, and potentially fatal risks associated with head

injuries in rugby, numerous scholars have called for the removal of the tackle in schools PE in the UK (Batten, White, Anderson & Bullingham, 2016; White *et al.*, 2018). Tackling, these scholars argue, is an “unnecessary risk” and failure to adapt PE to incorporate ‘tag’ rugby – a non-contact version of rugby in which a player wears a belt with two Velcro tags which opposing players attempt to pull off (in lieu of a traditional tackle) – instead is “sport focused rather than child centred.”

But this disposition is not one which has been unanimously adopted by the sport’s culture. Those working inside the sport reject the call to remove tackling from PE, writing that, “When the available evidence is taken collectively, it is clear that there remain a host of unanswered questions, gaps in the current knowledge and scenarios specific to the youth setting” (Tucker *et al.*, 2016, p. 924). Similarly, the Association for Physical Education (AFPE) – the representative subject association for PE in the UK – also rejected the calls to ban the tackle in PE, describing the recommendation as “spurious.” This was based on rugby’s centrality to PE curricula in the UK, which was described as providing “immense benefits for children and young people which are not always available to them in the classroom” (AFPE, 2017). Accordingly, AFPE offered their continued support for full contact rugby in PE, provided it was taught by suitably experienced staff. This line of reasoning was also supported by the Chief Medical Officers (CMO) and Physical Activity Expert group, who also rejected the call for tackling, and claimed that rugby does not pose “an unacceptable risk of harm” (Davies *et al.*, 2017). Thus far, then, recommendations to reconsider full contact rugby in UK PE have not been implemented.

Concussion prevention policies, the RFU, and ‘Headcase’

Over the past few years, rates of match-play concussion have increased in both professional and grassroots rugby (Raftery *et al.*, 2019). In the professional game, an increasing awareness

of concussion – combined with more stringent measures for its reporting – have been thought to explain these statistics. In grassroots rugby, however, Roberts *et al.* (2017) argue that the underreporting of concussion remains common, largely due to players’ lack of awareness of concussive symptoms—or unwillingness to report. At the time of writing, due to the lack of a dedicated surveillance project in school or club child rugby settings, we know little of concussion statistics at this level of play (c.f. Archbold *et al.*, 2017; see also Abernethy & MacAuley, 2003). Yet there is no reason to believe that school-boy injuries are not of a similar profile to other sections of the game.

In 2013, though, the RFU introduced a policy in an attempt to combat the increasing number of players who sustain a concussion yet continued to play. This was circulated with the aim to improve the understanding of signs and symptoms of concussion, thus being able to recognize concussion more effectively (RFU, 2019). This is currently completed through an online education course, where those who complete the resource pack and multiple-choice questions correctly receive a certificate. Although this resource has been mostly praised among the rugby community and professional medical bodies, Dr. Barry O’Driscoll, a medical advisor to the International Rugby Board (known as World Rugby since 2014) – the sport’s global governing body – resigned in protest at the introduction of a new test (known as the Pitch Side Concussion Assessment), stating that concussion cannot be diagnosed in five minutes (Peters, 2019). He later claimed that the RFU policy toward head injuries is “Confused and at times contradictory” (Roan & Slater, 2013). Importantly, there is an uncritical assumption by the RFU that through concussion education there will be a change in behavior, despite widespread evidence suggesting this simplistic approach is ineffective (Fraas & Burchiel, 2016). For example, while education initiatives have been found to improve knowledge, there is limited evidence that there is significant attitudinal or behavior change (Mrazik *et al.*, 2015). As such, Caron *et al.* (2015) suggest that engagement with

knowledge-transfer models, and by extension behavior change theory, should be considered in the development of any concussion education.

The RFU website for ‘Headcase’ provides very few considerations for player injury, players returning from injury, or what kind of severe injuries should be reported. Thus, the severity of the head trauma is left largely to personal interpretation. At the elite level of the game, when a player suffers a head injury, a qualified professional should complete a Head Injury Assessment (HIA) using the SCAT3, a standardized tool for evaluating athletes for concussion (upward of age 13). If the player fails the HIA, they must not return to the pitch and seek further medical advice (RFU, 2019). At the time of writing, however, this process is not compulsory in either schools rugby or PE – neither of which are required to monitor injuries in the same way as the elite game.

Similar concussion training has also been recently introduced for a variety of sports in the US. These include the ‘ACTIVE: Athletic Concussion Training’ programme and ‘Heads Up: Concussion in High School Sports’ programme. Scholarly evaluations of each have shown “positive changes in coaches’ knowledge, attitudes, behavior, and skills related to concussion prevention and management” (Sarmiento *et al.*, 2010, p. 117). Given that each course is delivered online, this leads Glang *et al.* (2010, p. 8) to argue that, “E-learning is a promising approach for providing this training to coaches...[it] has the potential to minimize the risks associated with sports concussion in youth and high-school athletics.” Critiquing education and concussion prevention programmes, however, Fraas and Burchiel (2016) conclude that there is limited evidence to support their effectiveness. Indeed, in the US setting, Hildenbrand, Richards and Wright’s (2018) qualitative analysis found that PE teachers had *some*, albeit relatively basic understanding and awareness of concussion. Thus, they argue that “further research, professional development opportunities, and policies for physical education are necessary” (p. 365). This could include more interactive, long-term

education programmes with a longitudinal assessment and evaluation strategy (Caron *et al.*, 2015).

Since its introduction in 2013, an evaluation of the ‘Headcase’ initiative remains lacking, and its effectiveness in providing successful concussion awareness training in UK rugby unknown. In a *British Journal of Sports Medicine* blog, White (2016) argues that a lack of evaluation is problematic, particularly given that ‘Headcase’ fails to complete Van Mechelen *et al.*’s (1992) injury prevention model. And, furthermore, ‘Headcase’ is presently acknowledged only sparingly in academic research investigating the relationship between rugby and concussion. Accordingly, the present article relies on data collected with a demographic who are directly impacted by this initiative—PE teachers—in order to judge its overall success in UK PE.

Methods

Participants

This study drew on in-depth semi-structured interviews with 15 secondary school teachers situated in the South East of England. Most participants (11) were recruited through the first author’s professional practitioner relationship with PE teachers in the local area, before a snowball sampling approach was then adopted to recruit the remainder (4). Participants were invited to participate in this study based on: (1) the fact that, due to their qualifications, they were responsible for delivering rugby-based education to pupils in their respective schools; and (2) their willingness to discuss the research topic. Illustrating participants’ qualifications, only those with a minimum of an official RFU Level Two coaching certificate were eligible for participation in this study. Moreover, each participant had also completed the RFU’s ‘Headcase’ training. Rugby was also the central focus due to the fact that previous research has identified it as the most injurious sport in PE (Abernethy & MacAuley, 2003; White *et*

al., 2018). Although a higher number of teachers than those who participated had initially agreed to participate in the research, some of these were forced to decline on the basis that they were too busy around the time of data collection.

Participants were made-up of 11 male PE teachers and four female PE teachers, and had an average age of approximately 32. Across the sample, there was a range of teaching experience, spanning from two years, to 25 years. At the time of data collection, each participant was employed as a PE teacher (or related variant) and currently employed in either an academy, comprehensive, or private secondary school based in the South East of England. Full participant demographics are outlined in Table 1.

Insert Table 1 here.

Procedures

Interviews focused on three main areas: (1) PE teachers' knowledge and education of head trauma; (2) PE teachers' experiences of managing head traumas in a PE context; (3) PE teachers' knowledge and implementation of the RFU's 'Headcase' policy. All interviews were conducted in-person by the first author, who is a qualified and current PE teacher. She was best placed to conduct the interviews, given her relatability to the sample and given that her views toward the topic area are moderate and socially acceptable (i.e. not for a ban on tackling in schools rugby or critical of the RFU concussion education process). Throughout the research, continual conversations took place with the second author who offered methodological support and critique. By taking this approach, we aimed to limit the influence of the researcher upon the views of the participants. The third author remained distant from the process of data collection to allow a rigorous critical challenge of the data.

Interviews lasted between 45 and 75 minutes, averaging approximately 60 minutes. Where necessary, interview rapport was struck with each participant through a mixture of formal and informal conversations regarding the first author's aspirations, education, and experience of PE reduced the risk of participants providing 'desirable' answers. From here, interviews went on to discuss a range of factors related to head trauma in sport. After confirming demographic information, this included discussions about participants' motivations for becoming a PE teacher, coaching qualifications, knowledge and experiences of head trauma in rugby, and the RFU's 'Headcase' policy.

Prior to interview, each participant was provided with an information sheet containing the aims and objectives of the research. Consent forms were also signed at this point. Ethical approval was gained from the authors' institution, and all guidelines of the British Sociological Association (BSA) and British Association of Sport and Exercise Sciences (BASES) were followed throughout the research process. Indeed, participants were assured of their anonymity and confidentiality throughout the research process, with pseudonyms employed in the results sections to place participants' genuine identities. These procedures were especially important in this research as outwardly speaking out against the RFU or even participants' own schools could be potentially problematic.

Where possible, interviews were immediately transcribed and coded upon completion of the data collection. A thematic analysis (TA) (Charmaz, 2014) was then employed to assist with the identification and analysis of the most salient patterns in the data. Braun, Clarke and Weate (2016, p. 191) argue that TA is widely recognized as the most effective method for "identifying patterns (themes) in a dataset, and for describing and interpreting the meaning and importance of those." To avoid a confused application of TA, Braun, Clarke and Weate's (2016) guidance list was followed throughout the data analysis process. This included a comprehensive approach to coding, and a detailed interpretation of analytic claims. Adopting

this approach ensured a “rigorous, deliberative process for doing thematic analysis that keeps ‘quality’ as a foregrounded concern” (Braun, Clarke and Weate, 2016, p. 202).

This included detailed analyses of interview transcript during the stages of data familiarization, data reduction, and the organization of inductive themes. Dominant themes were then critiqued, compared, and confirmed by each author (Hayes, 1997). Finally, to ensure the overall rigor of the analysis, we also sought support from an experienced scholar independent from the project; who cross-verified approximately a fifth of interview transcriptions.

Results

Ensuring pupil safety

Teachers play a crucial role in fostering an inclusive and ethical classroom environment (Brookfield, 2017). PE teachers in the UK are entrusted to enforce policy in the school setting, and act as a figure of responsibility to pupils, regardless of sporting ability and social background. They also inherit a fiduciary duty to behave in a manner which centers around pupils’ best interests. Due to their qualifications, all of the PE teachers interviewed for this research were responsible for delivering rugby-based education to their respective schools. Each of them also placed great emphasis on ensuring that PE was a safe space for their pupils.

This was perhaps best illustrated by Rob, Head of PE at an Academy school in the suburbs of a major city in the South East of England, who said that, “You have to be extra vigilant to students’ health and wellbeing... There is a culture in rugby to play through injury. I don’t want my children or grandchildren playing in that culture.” Similarly, Ben, a recently qualified PE teacher working at a private school, said that, “The first port-of-call has to be the children’s health... that has to take priority.” And Alex, who works in an Academy school

ranked as ‘outstanding’ by Ofsted – the governmental department responsible for inspecting a range of educational institutions – said that, “My school ensures members of staff are provided with sufficient training to ensure the kids are safe.”

Some participants also made reference to the “changing culture” of injuries in rugby. For example, Matt, a PE teacher who works for a comprehensive state school, said that, “Rugby has had this culture of not taking people off when they’ve been concussed or sustained [a] head injury...But that’s now changing.” Similarly, Alice, also a PE teacher at a comprehensive school, strongly declared that, “There should be no place in rugby for concussion.” She continued: “I play a high standard of rugby, and the way I’m treated with the slightest bump to the head is how I treat pupils in my PE lessons.” Tim, a PE teacher who works for an Academy school, said that, “There’s so much more attention being paid to things now...We have to be really wary of it.”

Despite acknowledgements of the increased awareness of concussion, however – in addition to these teachers’ creation of PE as a safe space for pupils – there were three participants who held an overwhelming feeling that rugby should remain unmodified, and retain its tackle in PE. For example, Tony, who is currently employed with a comprehensive state school in a major city, said that, “Injuries, whatever they are, are part and parcel of the game...There’s no reason we need to change it.” Similarly, Zak, who works for a private boarding school, believed that, despite the risks associated with concussion, they are just a part of contact sport.

Interestingly, however, this somewhat static outlook on rugby’s injury culture was rejected by the remaining 12 participants—all of whom declared the need for change. Jessica, an experienced Head of PE at an Academy school, said that, “No one takes part in sport to sustain an injury, least of all a serious one...It’s time for change...right from the top.” Becky, a PE teacher at a state comprehensive on the outskirts of a major city, said that, “Things need

to change and be more driven more towards safety.” And Tiffany said that, “Looking after kids is the main priority...We have so many injuries now and it makes you wonder how to change things.”

To remedy this potential issue, two participants broadly reflected on the potential of ‘tag’ rugby as a safer alternative. Matt was the only teacher in this research to have implemented ‘tag’ in his lessons, albeit only partially: “I play it with my new pupils, mainly just to get them moving a bit...[But] we still play full contact rugby alongside it.” And Joe, a specialist rugby coach at a private boarding school, said that, “‘Tag’ is definitely safer – we know that – but from my experience it just isn’t as popular...It’s tricky.” The vast majority of participants in this research, then, are in favor of at least some form of modification to rugby in British PE (e.g. White *et al.*, 2018).

Experiences and reflections

In addition to potential structural changes to rugby in PE, participants were also asked about their experiences of pupils who have sustained a concussion – or suspected concussion – whilst under their care, and how they might reflect on these experiences retrospectively. Interestingly, however, despite all teachers recognising their duty-of-care (as evidenced above), their lack of knowledge and expertise means that they are failing in ensuring their pupils’ overall safety. Tony, for example, said that, “I’ve had a few players that have had head-on-head collisions during rugby and I’ve questioned if they should go to hospital. Sometimes I’ve sent them, sometimes I haven’t...I guess I’m fortunate no one’s died.” Dan, a PE teacher with almost 15 years’ experience at multiple UK schools, said that, “I guess I just deal with things there and then which I think are right...I don’t really look back and think how I might do things differently.” Thus, these PE teachers were largely reactive – rather than proactive – in their management of potential concussions.

Problematically, a small number of participants relied on pupils' self-assessment – rather than following specific 'Headcase' guidelines. For example, Zak said that, "Sometimes when these things [suspected concussions] have happened, I wonder whether they should still be playing, but we are all our own people and know our own bodies best." Similarly, James, who works for an Academy ranked as "requires improvement," recalled numerous occasions when he has allowed injured players to return to the pitch based on their own personal assessment. This, he argued, was because he was unsure whether a player was "injured or just too tired." Similarly, Dan also allowed players to continue through injury: "I've let it happen before...If they've told me they're feeling fine, then I've let them continue."

Matt recalled one situation where he let a pupil continue to play after sustaining a head injury, but later suffered a bleed on his brain. "Acting as the first-aider, I allowed him to continue. But I should've taken him off...That was an error on my part." Evidenced most saliently through this example, the self-assessment approach to injury is a dangerous one, and likely a contributor to the disproportionate rates of concussion in rugby (McCrory *et al.*, 2017). Register-Mihalik *et al.* (2013) also outline the various motivations for why pupils may continue to participate in rugby, despite sustaining a concussion or displaying concussive symptoms.

Education

Each of the 15 PE teachers interviewed for this research held a minimum of a Level 2 England Rugby Coaching Award, and thus had some experience of teaching and coaching rugby in British PE. Education, however – or, rather, a lack of detailed knowledge within their rugby-specific education – was commonly identified by participants as the reason that they lacked the confidence to teach tackling techniques in rugby effectively. Given that the

tackle is the leading cause of concussions (and other head traumas) in rugby (e.g. Freitag *et al.*, 2015; Kirkwood *et al.*, 2015; Williams *et al.*, 2013), this is a concerning finding.

Evidencing his course's apparent shortcomings, Matt said that, "The course wasn't heavily based on safety. It was more focused on the delivery of sessions, and aspects of coaching, like passing and kicking." This, he described, was "pointless" because "we stand in front of a class and deliver every day." Alice also believed there to be an overreliance on these aspects of the game: "There was virtually nothing on tackling at all, which is worrying." Alex, who completed his highest coaching qualification nine months prior to interview, also expressed concern over the lack of education on tackling, because "that's where a lot of injuries occur." And, finally, Rob said that, "Most of the injuries I have witnessed have been in a one-on-one tackle, which is why tackling correctly is fundamental." Problematically, however, there exists no evidence that tackling technique will ultimately remove concussion risk (Batten *et al.*, 2016), thus calling into question broader issues related to child safety in rugby—especially in PE.

These concerns pertaining to education also extended to a lack of education regarding head injuries, a point raised by each of the 15 teachers. Given the recent high-profile focus and subsequent media scrutiny on concussions in rugby (Saffary *et al.*, 2011), Zak and Rob said that they were "surprised" at the lack of safety training. Ben said that the omission was 'deeply problematic'. He added: "Aside from doing another course 'off our own back,' what else are we supposed to do?" And the lack of knowledge provided on coaching qualifications led James to ask, "When do I say, 'enough is enough' when it comes to a pupil being taken off the pitch?"

'Headcase' Initiative

The most prominent discussions related to education focused on the RFU's 'Headcase' training initiative—rugby's dedicated training for concussion prevention and management. Interestingly, some previous research has found that introducing online training for sports coaches has had a positive effect on their ability to manage concussion in sport effectively (Glang *et al.*, 2010; Sarmiento *et al.*, 2010). By contrast, Fraas and Burchiel's (2016) systematic review of rugby's concussion education programmes found limited evidence for their effectiveness. Accordingly, the ability of PE teachers to create a safe sporting environment for athletes under their care must be questioned. Perhaps unsurprisingly, therefore, the PE teachers interviewed as part of this research were highly critical of the RFU's 'Headcase' training.

Of the 15 participants in this research, only three – Rob, Tiffany, and Tim – felt confident in applying the key teachings of 'Headcase'. Tiffany, for example, who, despite not teaching rugby on a regular basis, has completed the training. She said that, "Even though I don't teach rugby, I would feel pretty confident in recognising dangerous symptoms." However, it was Tim who demonstrated the most complete understanding of the 'Headcase' policy, its intentions, and its teachings: "The idea behind the policy is fantastic...It attempts to education everyone involved about the signs and symptoms of head injury." And finally, Rob said he found the course "useful," because it helped him "look out for certain things if there was a head injury."

These three participants were a minority, however. The remaining 12 PE teachers had only very limited knowledge of employing the correct course of action, despite all having completed the training in the past two years. When outlining their perspectives of 'Headcase', typical descriptions included "useless," "boring" and "pointless." This was largely due to the course's apparent "oversimplification" of complex issues related to concussions in rugby, matters which these participants already had knowledge of in their professional capacity. For

many of these teachers, 'Headcase' acted as a simple "tick-box" exercise; a perhaps unwanted necessity to complete a coaching badge. Tony described his completion of the course as "the quickest way to be able to coach rugby." This perspective was also shared by seven other participants, too, many of whom described as the course as "red tape" or a "simple requirement."

Participants were also critical of the course assessment, too. Becky, for example, said, "If you got a question wrong, you could just restart it...It just didn't inspire me that I could learn from it." Andy, a PE teacher at a prestigious boarding school, even witnessed another teacher pass the exam on someone else's behalf. Two participants were so disgruntled with the course and its ability to provide educational context of concussion, they failed to even complete the exam. Thus, among participants in this research, 'Headcase' can be described as a resource which facilitates a laissez-faire attitude to improving teachers' (and others') knowledge of concussion; one which potentially and probably perpetuates an unsafe environment for children in UK PE, and something which could prove life-threatening.

To remedy this issue, Joe said that educational resources could be enhanced by a member of the RFU delivering the 'Headcase' course in person: "That's how most other qualifications are delivered, so why not this one?" Others, including Tony and Becky, said that introducing an actual assessment to test participants' knowledge – similar to those set in various coaching qualifications – would force those completing the course to fully engage with its content. This would appear to be a sensible suggestion, particularly given that sports culture has becoming increasingly aware of the long- and short-term damage caused by repeated blows to the head. Regardless of what changes are made, however, we argue that modifications to existing training are a necessity to ensure that PE is a safe environment for all participants.

Discussion

Injuries have typically been an ‘accepted’ consequence of participation in hard-hitting contact team sports (Anderson & White, 2017). Over the past decade, however, the long-term damaging effects of repeated blows to the head has been a matter of significant concern. In rugby, numerous studies have identified the tackle as – statistically – the most injurious element across all levels of the sport (Archbold *et al.*, 2017; Freitag *et al.*, 2015; Kirkwood *et al.*, 2015; McCrory *et al.*, 2017; McIntosh *et al.*, 2010; Roberts *et al.*, 2017). This has led to recommendations that contact rugby be removed from UK PE (White *et al.*, 2018), something strongly refuted by the RFU and AFPE (Tucker *et al.*, 2016).

The intention of this research was to build upon recent quantitative analyses of PE teachers’ experiences, knowledge, and understanding of head trauma in PE (Hildenbrand, Richards & Wright, 2018). We conducted semi-structured interviews with 15 PE teachers situated in the South East of England – each of whom hold a minimum of an RFU Level 2 coaching award and have completed the RFU’s ‘Headcase’ training. With a specific focus on rugby, we document a range of findings. Congruent with previous research (e.g. Jess, Keay & Carse, 2016), the PE teachers we interviewed were committed and passionate advocates of their chosen profession, recognizing that pupils’ health and wellbeing was of utmost importance.

In line with recent calls for structural changes to rugby in UK PE, the majority of participants declared the need for some sort of modification to ensure that rugby remained a safe activity. Given that these teachers’ dispositions depart from that of AFPE – who reject such calls for modification, and encourage rugby participation in UK schools – this is an interesting finding. Should modifications be made to PE rugby, this may also lower the number of head traumas sustained in this activity (Kirkwood *et al.*, 2015). Even though only two participants referenced ‘tag’ rugby, this could be deemed as a safer alternative than full

contact rugby, as it removes the tackle. That said, however, we also acknowledge that further research is required to judge PE teachers' attitudes toward both the modification of rugby, and the implementation of 'tag' as a suitable (and safer) replacement (see O'Keeffe *et al.*, 2011).

We also found concerns regarding rugby-based education. This was apparent twofold: first, a lack of detailed training on tackling techniques (during their respective coaching qualifications) resulted in PE teachers' lack of confidence in addressing this topic with their pupils. While there is disputable evidence that tackling technique removes head injury risk, it is a surprising and potentially dangerous omission from rugby education. Second, all but three of the PE teachers we interviewed had little confidence in the RFU's 'Headcase' policy, arguing that it fails to provide sufficient training and knowledge of concussion – and other head traumas – in rugby. Thus, they feel ill-prepared and unconfident should a serious head injury arise, something which was also evident in the experiences upon which they were asked to reflect. Here, the failure to recognize a concussion sustained during a PE rugby lesson resulted in a small number of participants allowing pupils to continue playing. All of the information needed on how to effectively manage a concussion is contained within the Headcase training programme, but its effectiveness to influence teachers' confidence and practice has been less than optimal. We therefore argue that existing training programmes may be problematic for pupils' safety, particularly as they do nothing to prevent the risk of head trauma to the participant.

Experts, including the World Rugby's former medical advisor, have previously critiqued the simplicity of concussion education programmes (Peters, 2019). In the case of 'Headcase', the PE teachers in this research criticized the policy's assessment – an exam with unlimited attempts – and believed a more rigorous approach would be beneficial for concussion management, particularly given its importance. Interestingly, however, while

some research has documented the success of similar education programmes (e.g. Glang *et al.*, 2010; Sarmiento *et al.*, 2010), Hildenbrand, Richards and Wright's (2018) research in the US found that PE teachers' knowledge of concussion was relatively simplistic. Fraas and Burchiel (2016) therefore argue that "there is a dearth of evidence to support the effectiveness of...prevention programmes that provide education about and management of concussion" (p. 1216).

With this in mind, it may be that some amendments to existing training are required. First, amending 'Headcase' to be delivered by a qualified practitioner, or form a central part of existing coaching qualifications, may better highlight the overall importance of PE teachers' (and others') knowledge of head trauma in rugby. Next, given that pupils' safety is paramount, it may also be beneficial for PE teachers delivering contact rugby to complete mandatory tackle training. Finally, because head trauma in sport has been afforded greater attention in recent years (see Renjilian & Grady, 2017), keeping thorough logs of injuries sustained in PE may also better practitioners' understanding of how frequently this occurs. This is also supported by the fact that up-to-date statistics are lacking (e.g. Abernethy & MacAuley, 2003).

Limitations

This research is the first-ever empirical analysis of PE teachers' knowledge, experience, and attitudes toward concussion in rugby. While these findings indicate raise some important issues in PE and rugby, we also recognize its limitations. For instance, our sample is restricted both in size (15) and geographically (South East England). Because of rugby's varying popularity, it may be compulsory in some schools; where this is the case, results may differ—as a consequence of PE teachers' experience and knowledge of the game. We therefore acknowledge here that the results presented in this study must act as a point of

departure for future research on PE teachers' knowledge, understanding and experiences of concussion in rugby (see also Hildenbrand, Richards & Wright, 2018).

We also recognize that our sample lacks ethnic diversity and, but for some exceptions, includes a relatively inexperienced range of teachers. More experienced teachers may, therefore, yield different results. Accordingly, we also note the potential generational impact in our research, and our sample may be more critical of rugby's safety culture, due in part to the high-profile nature of head trauma in contemporary sport (Saffary *et al.*, 2011). By comparison, more experienced PE teachers and coaches are less inclined to challenge the 'status-quo' of the 'accepted' nature of head injuries (e.g. Adams, Anderson and McCormack, 2010). Thus, more in-depth research – with a broader and more diverse sample – is required to further investigate this issue.

Future directions

As we have outlined in the previous section, future studies which investigate the relationship between injury, rugby, and PE are much-needed. Previous research has already shown that 'tag' rugby is less injurious than the mainstream sport (O'Keeffe *et al.*, 2011); however, less is known regarding PE teachers' attitudes toward adopting 'tag' as an alternative. Given its current position as a relatively peripheral sport in PE, this would be a useful addition to the literature. Because 'Headcase' is designed to be inclusive of players, match officials, coaches, and parents/guardians, it would also be useful to judge the effectiveness of the programme according to these people—and beyond that of PE teachers. This could also lead to research into a more effective – and safer – means of concussion prevention and management.

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