

'IT ISN'T MY AREA.' COACHES' AWARENESS OF CONCUSSION PROTOCOLS IN SCOTTISH YOUTH FOOTBALL

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Abstract

This paper discusses an externally-funded project into Scottish coaches' awareness of the sports concussion prevention initiative, *If in Doubt, Sit Them Out*. It explores the short-term risks of concussion to youth participants in particular before analysing the data from interviews with ten coaches of girls' football. The coaches' apparent lack of awareness of the policy are highlighted and the possibility that the different resources in girls' and boys' football, and between girls' performance and girls' recreational participation, might impact on injury recognition and treatment, are explored. The paper highlights the need for further research into those areas, and the need to immediately address the apparently low levels of awareness of *If in Doubt*. With that in mind, proposals for both immediate and longer-term reform for its dissemination are introduced.

Keywords: concussion; girls' football; coaches; interviews; Scotland

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Introduction

This paper concerns one element of a wider project on sports-related concussion and youth participation. The wider project compares concussion awareness initiatives in Scotland and the United States (De Martini et al, 2021) and interrogates the relative strengths and weaknesses of legislative and voluntary frameworks in the US (Kim, S et al 2017), while this paper draws exclusively on the data from semi-structured interviews carried out with coaches of youth football in Scotland in summer 2018, which were concerned with their awareness of and responses to the *If in Doubt, Sit Them Out* anti-concussion campaign. *If in Doubt* is central to Scottish sport's attempts to prevent, identify and minimise the consequences of concussion. It focuses on youth sport but seeks to raise awareness among participants of all ages and abilities.

If in Doubt has its origins in a global awareness-raising initiative which, in turn, was based on a campaign that the leading global authorities in the field have pursued since the turn of the century. Domestically, it has the support of the Scottish Government, SportScotland and individual sports governing bodies. It shares some similarities with a recent policy-change in Scottish football to prohibit heading the ball by younger players and to restrict it among older age groups: both seek to address longstanding concerns about the links between sport and the consequences of head injuries, and both rely on coaches to mitigate the risks to participants.

Background

In February 2020, the Scottish Football Association (SFA) introduced new guidelines on children heading footballs in training sessions and during matches. They state that heading should not be coached to children under 12 and it should be a 'low training priority' thereafter. The SFA advised that balls should be inflated to the lowest level allowed under the Laws of the Game and coaches should discourage tactics which promote heading, including 'long balls' and head-high passes (Scottish Football Association, 2020).

The guidelines were ostensibly introduced in the wake of 'a study linking former footballers with degenerative brain disease' (Shedden, 2020), but that study (Di Virgilio et al, 2016) was already old news. It had provided 'evidence of decreases in measures of both short- and long-term memory' immediately after heading the ball, and although the alterations to participants' memory function appeared short-lived, 'these novel observations demonstrate, for the first time, detectable alterations in brain function ... as a direct consequence of soccer heading' (Di Virgilio et al, 2016: 69-70). At the time of its publication, the Scottish Youth Football

Association (SYFA) had said that its new guidelines would be published ‘as soon as possible’ (Murrie, 2016). A documentary with celebrated English footballer Alan Shearer (BBC 2017) provided further publicity, but another two years would elapse before anything notable happened.

Scottish football’s approach to the risks of heading is in keeping with the rest of the UK, and it illustrates sporting and political responses to concerns about head injuries generally: if they respond at all, they do so when the scientific evidence has been in the public domain for several years. Similarly, *If in Doubt* was launched in 2015 (Slater, 2015) after many years’ worth of scientific and medical data had illustrated the risks, although all sports jointly committing to a single initiative was a welcome development. But both initiatives have placed new responsibilities on the volunteers upon whom recreational sport relies. At the re-launch of *If in Doubt* in 2018, concussion awareness campaigner Peter Robinson (whose son Ben died after sustaining repeated head trauma during a school rugby match in Northern Ireland) emphasised this importance of coaches when he said that:

... it only takes one person to recognise the signs and symptoms of concussion and that could be a teammate, spectator, parent, coach or referee. At grassroots level we don’t have the luxury of medical back-up ... so we all have a duty to be informed. (SportScotland, 2018)

Representatives of government and other sports also emphasised the importance of volunteers while the Scottish Football Association (2018) noted that *If in Doubt* had consistently focussed on ‘providing clear, simple guidance to coaches, officials, parents, teachers and athletes.’ It is generally accepted that coaches carry out this role, but they are not medically-trained professionals and *If in Doubt* does not require them to be. While a reliance on volunteers is a key feature of sports - it is a truism that grassroots participation could not function without them (Findlay-King et al, 2017) – volunteer sports coaches, with very little medical training, are expected to understand and implement heading and concussion protocols which sports and governments had taken several years to develop.

Scotland’s approach to concussion

The first high-profile global medical initiative on sports-related concussion dates from 2001 (Aubrey et al, 2002). *If in Doubt* was based on a 2012 Consensus Statement on Concussion in Sport written by eminent neurosurgeons, academics and scientists who had been involved in that first international conference while the 2018 version incorporated the recommendations of

a follow-up international conference in 2016 (McCrory et al, 2013; 2017). The 2012 Consensus Statement recommended that an immediate assessment should be carried out using an abbreviated testing paradigm, and abbreviated testing now forms the basis of most pitch-side assessments for sport-related concussion. It is to be used in situations where ‘specialists in sport and exercise medicine are not available to manage concussed individuals’ but it is not supposed to replace ‘comprehensive neuropsychological testing which should ideally be performed by trained neuropsychologists’ (McCrory et al 2013: 251). Diagnosis is a medical decision based on clinical judgement, not on the perceptions of a well-meaning lay person referring to a handout, and the whole point of abbreviated testing is that it is accessible to people in the latter category.

In similar vein, the 2018 version of *If in Doubt* emphasised that any participant who is ‘suspected’ of having a concussion should be immediately removed from play and it listed the signs and symptoms which might cause concern. But it again stressed that abbreviated testing should not be used as a means of either confirming, or departing from, a perception that concussion might have occurred (SportScotland, 2018: 3, 7). A Sport Concussion Assessment Tool, the SCAT 5, and a Concussion Recognition Tool, the CRT5, offer guidance for medical and nonmedical personnel respectively. The *If in Doubt* website (SportScotland, 2018) provides extensive guidance on their use while the CRT5’s authors recommended that ‘every sporting group and school team should ensure that all their personnel are familiar with the CRT5, and that the CRT5 is included in the first aid bag for each and every team, whether it be game day or practice’ (Davis et al 2018: 235).

The difficulty is that the entire, global, concussion-awareness initiative operates on the principle that *any* concerns should result in immediate removal. That message cannot be easily reconciled with encouraging reference to a recognition tool and ‘ensuing familiarity’ among lay volunteers. There is a risk that encouraging reference to other sources means the message will be lost rather than enhanced, and that people might be tempted to depart from their first instincts. It might be appropriate for accredited youth sports coaches in the United States, who might be expected to have a greater degree of knowledge for reasons we have explored elsewhere (De Martini et al, 2021) but Scottish grassroots sports ‘survive through...the use of volunteer – rather than paid – staff’ (Macrae, 2017: 15) and they rarely have the training that their colleagues in the United States are exposed to. Exploring this tension between the status of coaches and the demands placed upon them in different jurisdictions lay at the heart of the wider research.

Before proceeding, it is important to outline the medical concerns which have informed that project. First, and as noted above, the media and popular discourse about head injuries in sport have focused on the long-term impact of conditions such as dementia and chronic traumatic encephalopathy (CTE). This project does not seek to downplay those concerns; rather, it seeks to highlight the risks of Second Impact Syndrome (SIS), and to raise awareness of the possibility of this arising if coaches tasked with responding to a concussion fail to do so. The scientific and popular focus on dementia and CTE ensured that they got most of the attention once sports' authorities engaged with the problem; but the implications of SIS and the particular burdens it places on coaches merit more attention than they have received, and the immediacy of the risks should be better addressed in the concussion protocols and information documents.

The role of volunteers and the complexity of concussion

Across studies, coaches cited the misconception that there needed to be a loss of consciousness to indicate a concussion, which is not true. Additionally, a quarter of coaches reported that they would not remove a player if they suspected a concussion. Almost one in five parents reported that they would not seek medical attention for a concussion (Rieger et al, 2018).

‘The potential consequences of returning to contact or collision sports while still symptomatic from an initial concussion can be catastrophic’ (McCrea et al, 2004: 14) and they explain why head injury is the most frequent direct cause of death in sport. ‘The brain is vulnerable to the accelerative forces’ which are a particular feature of contact and collision sports (Cantu, 1998: 40). However the risk is not with the immediate concussions, which ordinarily result in short-lived impairments which resolve spontaneously and manifest in ‘a functional disturbance rather than a structural injury’ (McCrory et al 2013: 251), so much as with a second injury occurring before the first has resolved. The second injury can arise from something as minor as a driver suddenly braking or a child falling over in the playground.

Bey and Ostick explained (2009: 6) that SIS arises from ‘the brain’s auto regulatory mechanism protecting against massive swelling by...acutely limiting cerebral blood flow, which leads to an accumulation of lactate and intracellular acidosis’ in the immediate aftermath of the first injury. This altered cerebral metabolism can last for up to ten days and involves ‘decreased protein synthesis and reduced oxidative capacity’ which renders the brain vulnerable in the

event of a second injury, even one of even less intensity than the first, because that auto regulatory response cannot ‘work’ a second time.

The second blow may be remarkably minor, perhaps only involving a blow to the chest that jerks the athlete’s head and indirectly imparts accelerative forces to the brain. Affected athletes may appear stunned but usually do not lose consciousness ... They usually remain on their feet for 15 seconds to 1 minute or so but seem dazed, like someone suffering from a (mild) concussion without ... loss of consciousness. Often, affected athletes remain on the playing field or walk off under their own power.

What happens in the next 15 seconds to several minutes sets this syndrome apart from a concussion or even a subdural hematoma. Usually within seconds to minutes of the second impact the athlete – conscious yet stunned – quite precipitously collapses to the ground, semicomatose with rapidly dilating pupils, loss of eye movement, and evidence of respiratory failure (Cantu [1998]: 38).

A further complexity for sports volunteers is that concussion decreases cognitive ability and reaction time, so an athlete who returns to play too early may have a diminished ability to respond to the demands of the sport (for example, by incorrectly timing a tackle in rugby or failing to move one’s head out of the way of a cricket ball).

SIS is extremely rare. One recent literature review noted only 36 potential cases being recorded across all medical publications, but there is a significant risk of extensive under-reporting and ‘the syndrome is often deadly’ (May et al, 2020). The mortality rate is reported to be 50% and the morbidity rate (the incidence of ill-health among those who suffer from it) is close to 100%. ‘Because the consequences are so catastrophic and because SIS is more common than previously thought...educating athletes and their parents cannot be overemphasised’ (Cantu, 1998: 43). Because abbreviated testing paradigms place so much attention on educating coaches, it is equally important that they are aware of SIS too, if only to reinforce the principle of utmost caution. But maintaining the distinction between education which raises awareness and education which inadvertently encourages people to try and diagnose is also fundamental.

Methodology and methods

In a two-month period shortly after the 2018 version of *If in Doubt* was introduced, ten face-to-face semi-structured interviews were carried out with volunteer coaches of under-14 girls’

football teams playing in leagues across central Scotland. Some participants were already known to one of the authors, others responded to emails sent to clubs' websites and some were contacted via those who fell into the other categories. Eight were men and two were women. They coached at a variety of teams ranging from Scotland's largest to some of the smallest, and they worked with players ranging from potential junior internationals to those who had barely kicked a ball until recently joining. Using Saldana (2016), the semi-structured interviews explored participants' knowledge of *If in Doubt*, their understanding of concussion and how that understanding had been informed by football-related training or education as opposed to previous relevant experience, the media or other sources of information. We hoped that the interview data would inform future research on how the awareness/diagnosis distinction can be adapted for other health situations where sports volunteers might be asked to play a role, and although we did not expect coaches to be familiar with SIS we also hope to highlight that the risks of concussion are not limited to outcomes which might not arise until 30 or 40 years later.

The semi-structured interview questions were developed after a comprehensive review of the literature (Kim and Connaughton, 2020). A panel of six experts including youth sport coaches, concussion safety specialists and qualitative researchers reviewed the questions for comprehensiveness, clarity and formatting. Researchers made minor modifications to the questions after the expert panel review. A university ethics committee approved the questions and the methodology. One primary researcher conducted all the interviews and participation in the interview process was voluntary and unpaid. The interviews lasted between 45-90 minutes. Participants gave written consent to the anonymised use of their responses and the transcripts were sent back to them for review to ensure accuracy.

The first coding cycle identified several very broad, over-arching themes, namely the playing experience of the interviewees; the coaches' relationship with parents; the perceived difficulty of spotting and responding appropriately to a potential concussion; the scope of the coach education that was available through the governing bodies; the perceived adequacy of that information; and the usefulness of other sources of information. Analysis of the first cycle data was facilitated by analytic memos which supported deeper critical reflection of those themes and supported future coding cycles, but even at this earliest stage, two surprising themes emerged.

First, it was quickly apparent that the interviewees' awareness of *If in Doubt* was far more limited than the interviewers had anticipated. Second, those interviewees who had undertaken specific concussion training had not done it through the auspices of Scottish football. Relatedly, their concussion knowledge was more likely to have been gleaned from social media, the news media or TV and film and it was not rooted in any meaningful medical or scientific information. Being mindful of the Spindlers' (1992: 53) advice that 'only the human observer can be alert to divergences and subtleties that may prove to be more important than the data produced by any predetermined categories of observation or any instrument' the focus of the data analysis shifted so that those themes and their implications became central to the second coding cycle. Through the use of analytic memos, this second cycle resulted in the emergence of three key themes: *Relevant Experience*; *Concussion and Wider Coaching Challenges*; and *Discerning the Limits of Concussion Knowledge* as explored below.

It is important to acknowledge the survey's limitations. First, there are hundreds of youth football coaches in the country and only ten were interviewed. None of the interviewees were from black or minority ethnic backgrounds and several of them either personally knew one of the authors or their contact details were provided by an interviewee who did. The authors are grateful for their willingness to participate, but finding interviewees was a challenge. Restrictions of time and budget meant that all the participants were located in the central belt. They all participated in the same sport and it is possible that the experience of other football coaches in the region, those who coach other sports or those who coach football in other parts of the country will be different; but the research provides a basis for further study by highlighting points of interests and potential concern. It does not, and cannot, seek to quantify the extent of coaches' knowledge and engagement beyond those interviewed.

All participants' names are pseudonyms.

Results and Discussion

Relevant Experience

There were wide differences in the interviewees' playing and coaching experience, with some having played at a high level and others taking little interest until their own children started playing; but there was a notable link between playing experience and respondents possessing

coaching qualifications beyond the most basic level. This was potentially significant because one might expect medical issues to be introduced in those higher-level qualifications.

Julie was the most experienced, having played in every age group for the Scottish national team and the full national side. She coached the u14 team at one of the best-resourced clubs in the country; their men's and women's first teams play in the nation's top divisions and several of their u14 players had moved from other teams in the hope of doing likewise. She had a related degree and several coaching, first aid and other qualifications. Similarly, Josh had played semi-professionally and had obtained several coaching qualifications. He returned to coaching when his children started playing, although he was not involved in coaching them. In contrast, Paul had not played but started coaching while living in the United States. Being unimpressed by his daughter's coaching, he had coached her team and continued on his return to Scotland – but he had no coaching qualifications from either place.

Sarah had also coached extensively in the US, first at summer camps then while living there permanently before returning to Scotland. She had coaching and first aid qualifications. Leo had also started by coaching his own children, but like Paul he had no coaching qualifications and no particular playing experience. Gavin was a sports science graduate who still played and had several coaching qualifications, while Adrian was a teacher who had never played until his daughter started and the club needed a coach. Mike was head coach at one of the country's larger clubs; he had responsibility for several coaches and had the qualifications to go with it. Finn had coached several boys' and girls' teams and had played semi-professionally. Alan had coached his sons until they stopped playing and he then moved to a local girls' team which needed support.

Almost all interviewees had at a Bachelor's degree while Paul had a doctorate - but not all of them had coaching qualifications and not all of them had played football very much. The two interviewees who did not have coaching qualifications had got involved because their own children's team needed a coach, but in very general terms the more the coaches had played, the more likely they were to have more than one coaching badge and possibly other qualifications. For some, the primary motivations were clearly extrinsic (supporting their own children in playing) or intrinsic (coaching as a means of career-enhancement or as a requirement for their studies), but several said they just 'wanted to be involved' or to stay involved if they were no longer playing.

The fact that two people in a cohort of ten interviewees were coaching although they had no coaching qualifications was an unexpected turn, and there was surprising confusion over whether a qualified first-aider also had to be in attendance at matches. The need for a qualified coach was generally acknowledged and as Mike said with some hyperbole, ‘you are not allowed anywhere near the club unless you have taken the (introductory coaching) course’ as a minimum, but in the course of his interview another coach had realised that ‘I should probably go and do’ the introductory course, being hitherto unaware that it was necessary. In terms of first aid, Paul ‘can’t honestly say’ that a first-aider was always present at matches and there was ‘not really’ a first-aider attached to his girls’ teams anyway.

One might argue that not knowing whether first-aiders should also be in attendance does not matter much, because most of the qualified coaches had completed at least one first aid course as part of their ongoing professional development and were thus able to fulfil both roles. But it was striking that interviewees were confused about such a basic issue. Sarah thought there was no first-aider requirement (‘it is not compulsory, which it should be’) and discussed an occasion when she had to leave her team’s match in order to take an injured opposition player to hospital because she was the only first-aid trained person there. Paul agreed with Sarah but Finn rightly stated that ‘in terms of footballing bodies you have to have a first aider on your touch line’ during a match. This meant his (poorly-resourced) club needed its volunteer coaches to fill the first-aider roles too:

INTERVIEWER: So all of the coaches have to be first-aid certified?

FINN: No, they don’t *have* to be but we do it. Everybody here has to do first-aid training because in terms of the footballing bodies’ (requirements) you have to have a first-aider available on your touchline.

INTERVIEWER: So here all coaches are also first-aiders?

FINN: Yeah, they would be.

Gavin said there ‘may’ be a trained first-aider but it was not compulsory.

For the avoidance of further doubt, the provision of a qualified first-aider is mandatory at Scottish Youth Football Association matches and that person has to be named on the team sheets that are submitted to referees, just like the players’ and the coaches’ names are. Pragmatically, clubs can agree to ‘share’ a first-aider if only one is present but when a situation like Sarah’s occurs and the one qualified first-aider has to leave, the game should be abandoned.

Nobody explicitly said the girls' teams were less well-resourced than the boys in terms of qualified coaches' and first aiders' presence, but the issue demands further exploration because there is strong anecdotal evidence that girls are less well-resourced than boys across all sports in Scotland and have fewer participation opportunities as a consequence. If further research indicates that this difference in treatment also impacts on the availability of people with first-aid training, the matter will have become even more pressing.

Concussion and Wider Coaching Challenges

The perception that there were not always adequately-trained first-aiders or coaches, together with some fairly scathing comments about parents' lack of interest, facilitated discussions about how parents helped or hindered the work of coaches in handling medical situations. Other important differences between girls' and boys' participation were aired at this stage, but very significant differences *within* girls' participation were also noted. Josh felt that both pressure and support from parents had largely disappeared – 'they drop the children off, they pick them up and that is the end of their involvement' – and while acknowledging the risk of generalisation, he broadly felt that girls' parents wanted them to have fun, enjoy and develop social skills whereas the boys' parents were more results-driven, more invested in their sons' individual performance and more likely to be critical of coaches' decisions. Leo agreed that the environment facilitated by the girls' parents was much more encouraging, 'they want the best for their kid...you would get push back if you tried to transfer that to boys' and respondents generally felt there was at least the potential for boys' parents to feel the stakes were higher. Gavin had experienced parental attempts to influence team selection and, very rarely, his management of injuries but gave them short shrift ('we completely nullify those kinds of antics.') However, he acknowledged he had no influence on parents being willing to take medical advice once their child was away from the club and felt there had been times when parents had returned their children back to training too soon. Isolated incidents aside, there was no notable perception that parents might try to persuade a child to play through injury or pressure the coach into allowing it. Any criticism of coaches' decisions was far more likely to be about tactics or team selection than about injury management.

It was clear that some of the smaller clubs' coaches would have welcomed more parental involvement, and this was another area where the differences between clubs was stark. As noted, the interviewees spanned the whole range of coaching environments; some worked with teams attached to the biggest clubs in Scotland while others worked in far more challenging

environments with young people who had fewer opportunities. Sarah's club was in the latter category.

A lot of deprivation, a lot of drugs and a lot of trouble if you go about a mile (from here). It's not the best place to be and...it's like a reward to come down here and play. They have paid to play, it's like 50p (a session) or something and you play as much as you want. It's really difficult and getting to a stage where we need new training stuff and parents are like 'I can't afford to buy a brand new shirt.' We fundraise together because it's not fair if most have stuff and you don't. (Sarah)

In contrast, Gavin acknowledged that his team, part of one of Scotland's largest clubs, had personnel and financial resources that Sarah's did not. The coach and the first aider were not one and the same person because there were plenty of parent volunteers and the burden could be shared, in contrast to Josh's perception of a 'dump and run' mentality. If more detailed research into football and other sports confirms that a gulf exists between different girls' sides as well as between girls and boys, the potential for that gulf to also impact on first-aid treatment will likewise demand investigation. It certainly appears that the performance-focused set-up which exists within the Elite, Progressive and Performance teams attached to men's professional clubs (Scottish Football Association, no date 1) has potentially created its own problems for girls' participation more widely, as is evident from the gulf between the world Gavin and Josh inhabited and Julie's make-do-and-mend environment. While not wishing to labour the point on the basis of such a small-scale interview, there is a legitimate concern that the best players are gravitating towards a handful of clubs and taking enthusiastic parent volunteers with them.

Josh reinforced this concern, arguing that in the context of resources and parental involvement the key difference wasn't so much between girls' and boys' sides as 'the huge gap' between girls' recreational clubs and girls' performance clubs. This was reflected in other interviewees' belief that the availability of funding for first aid and coaching courses was as much of a difficulty as finding the people to do them, and the interviewees thought that most boys' teams faced the same resource challenges as most girls' teams. It seemed that only those linked to professional sides consistently had the luxury of a volunteer coach who was not also a first aider, child welfare officer, a matchday linesman or the club administrator. Some interviewees had carried the cost of course attendance themselves, again in stark contrast to Gavin who noted

that within his club ‘there is help from the physios and the (club) doctors regarding the health of the players... trusted people are here to do that.’

On a more positive note, Leo (who was coaching without any qualifications at a grassroots club) perceived a general willingness on the part of coaches, referees and other volunteers ‘to defer to whoever says ‘take her off’ if there is an injury’, and that was the case regardless of who was making the suggestion. That approach is to be welcomed and encouraged, because erring on the side of caution is more consistent with the logic of abbreviated testing than is (implicitly) encouraging a coach to identify a potential concussion when they are not qualified to do so. This raises the fundamental question of how much ‘doubt’ there should be in people’s minds before the decision to ‘sit them out’ is taken, and it also leads one to reflect on whether, perhaps paradoxically, the focus should be not on providing more concussion training but in encouraging a culture where the player’s withdrawal is the default and everyone involved in the game feels able to say so. That would be consistent with the straightforward ‘do not head the ball’ strictures to younger players in the 2020 Guidelines and would be a pragmatic acknowledgment of the limits of what coaches, first aiders and other volunteers can realistically be asked to do – especially when they are doing several things at once.

Coaches’ exercising caution would be facilitated by the simple expedient of allowing rolling substitutes at the ‘performance’ level. Sarah was one of several who mentioned this, while acknowledging that her club has a lot of players available so perhaps that lessens the pressure to keep players on - or for players to want to stay on when they should not - but are no rolling substitutes at the performance level because of FIFA rules, so one wonders if those boys and girls are potentially more vulnerable because their perceived higher ability level and the higher stakes might make them less willing to mention non-visible injuries to coaches or parents. In contrast, Julie often struggled to raise a full team (‘I don’t know if I’ve got a goalkeeper because she hasn’t replied, you chase them and chase them and you get to Friday and you are still waving your hands.’) so the idea of having any substitutes, rolling or otherwise, bore little resemblance to reality and this could also result in injured players feeling compelled to play on. But it was clear within this very small cohort that nobody wanted to take risks with a child’s health. We did not perceive a ‘problem’ with the intentions or the decision-making capacities of individual coaches. The challenges arise from the game’s funding and governance structures both nationally and globally, and the argument that fourteen year-old ‘performance’ players should be playing under the same rules on substitutes as those in the World Cup final rather than those for other fourteen year-olds are particularly unconvincing.

Discerning the Limits of Concussion 'Knowledge'

Coaches were routinely faced with situations where they did not know if a child was genuinely injured and were unsure how to respond. Leo, for instance, spoke of the frequent challenge of distinguishing a potential concussion from situations where a child simply didn't want to play and had pleaded a headache, but if one adopts the logic of utmost caution a child who feigns head injury should have created enough doubt for the coach to let them 'sit it out' even if the coach is unconvinced. There is little merit in having a child play when they don't want to and it is not the role of coaches to try and cajole a reluctant child. Leo also emphasised 'my own knowledge' as a key source of information and he went on to say that he would look for something beyond a child 'just saying that 'I am in pain,' but one would hope that 'one's own knowledge' would encourage caution because that is the message which abbreviated testing paradigms convey.

When the project was in its early stages, we would have anticipated discussing whether the language of *If in Doubt* and its recommended use of assessment tools has encouraged attempts to diagnose rather than erring on the side of caution. We are not in a position to do this because it transpired that hardly any of the interviewees had heard of *If in Doubt*. They had no meaningful knowledge of it, and it had not informed their decision-making processes because the interview was the first they knew of its existence. This was a third significant departure from the expectations that had informed the project's early stages and merits further exploration.

All coaches were asked open questions about their sources of concussion information rather than specific sources such as *If in Doubt* or the Alan Shearer documentary being mentioned. Finn (a former semi-professional player and coach of both girls' and boys' teams) was the only interviewee to mention what is supposedly the key awareness-raising tool for concussion within Scottish sport: he referred to 'Sit Out' (sic) as 'the basic move from the government push...and certainly for me it has been a big influence.'

I think the key message are about uneven pupil sizes, about questioning techniques and I think about information-sharing to the young persons out of your care and back with their parents, and I think about the sitting-out period of time. (Finn)

The source of his information 'I think was from the Scottish Women's Football Association ... but I'm quite active on social media. I think it would have been either the SWFA or from Twitter.' None of the other nine mentioned the *If in Doubt* campaign or the documents

accompanying it, and when it was mentioned they had no insights to offer. Mike's understanding of concussion 'came from an American study' and when given a leaflet about *If in Doubt* said 'I don't think that has been mentioned to the club at all, not that I'm aware of ... I might go home and actually read this.' Alan said that 'clubs over the past ten years have become more conscious around child protection generally' and his club 'has shared information within particular teams (but) do not have in place any particular protocol or policy' about concussion. Paul was clearly concerned about his and others' lack of knowledge about it, noting that when he coached in the United States several years previously 'there was no information at all, which really isn't good and then when I came back to Scotland I'm not really aware of people getting much information here ... I think there is some trouble we should be making here.' Adrian noted that he received many emails on a host of topics from the SFA, SWFA and the SYFA 'but I have not seen one about concussions.' Julie said her concussion information was from a website that had nothing to do with football or *If in Doubt*, 'I just saw it on a website and I like to read.' Sarah had experienced a concussive injury herself but said 'I didn't know (*If in Doubt*) existed ... people don't know about it, it is not given in booklets ... and it is never brought up.' Josh similarly said 'there is nothing that comes down from (the governing bodies) ... in terms of guidance, nothing trickles down.'

This lack of awareness compels consideration of coaches' other sources of information, because all of them had some awareness about signs and symptoms although their knowledge tended to arise from information about long-term conditions such as CTE. There was certainly no awareness of SIS, which was never mentioned. Julie was one of several to discuss the Alan Shearer documentary, but she was concerned that 'nobody knows or understands (concussion), it's not black and white.' In contrast, Gavin felt that 'we do actually know about it but nothing has been done,' referring to the 'research on dementia in documentaries.'

Several respondents noted that the documentary, the 2015 Will Smith film *Concussion* and information gleaned from other sports such as rugby or the NFL is focussed on men and boys' participation and rhetorically asked if there were physiological differences that need to be better dealt with. To date, the various Consensus Statements have avoided sex-specific distinctions on diagnosis and treatment because the current scientific evidence does not warrant them. Sarah was aware that girls tended to have less strong neck muscles and that could cause problems if they are repeatedly heading the ball – but it seems that even before the 2020 rules were introduced, these interviewees were not encouraging heading either in training or in matches anyway. Leo noted that he had neither coached nor encouraged heading long before it was

banned in the youth game in Scotland, while Adrian also stated that ‘this club doesn’t teach heading. That came from a study on the physical presence of men and women’ which had suggested that women were indeed at higher risk. Julie made the same point, Mike also said that ‘we as a club have a rule that we don’t practice heading’ and this was a consequence of media coverage - but, again, their knowledge concerned the long-term risks associated with heading, not the short-term risks associated with colliding with a goalpost or receiving a knee to the head. Even those who had coached in the US had no particular information other than a vague awareness that heading was perceived as ‘risky’ - apart from Sarah, who had sustained a concussion during her time there.

Closer to home, Adrian referred to the media coverage of Ben Robinson’s decease, while Josh was one of three who mentioned the death of Jeff Astle, a former professional player whose death as a result of dementia was held by the coroner to be due to heading the ball (Hart, 2015). But Jeff Astle had died nearly twenty years previously and it was striking that it remained prominent in their minds. In any event these were all incomplete sources of information and the lack of awareness of *If in Doubt* deprived coaches of an important opportunity to reflect on the principle of utmost caution. Josh noted those delivering the coaching courses he attended had rightly perceived concussion as a first aid issue, but even though several interviewees had received some first aid training it was apparent that those courses did not cover concussion either so there was no means of filling the void that the lack of knowledge about *If in Doubt* had created. One interviewee said as much when he simply commented that ‘it (concussion) is not my area.’ That did not mean he would not look after an injured child to the best of his ability, far from it, but it was an acknowledgment that he had no formal training and expected others to fill the void. In contrast Sarah said ‘we did a first aid course a few weeks ago and we got 15-20 minutes on it maybe, just like the signs and stuff,’ but this was a course from an external provider which she had paid to attend. Our expectation that medical issues would be introduced in the more advanced coaching courses proved unfounded.

Conclusions, and Suggestions for Reform

On reflection, it is unsurprising that the coaching courses which volunteers are supposed to complete before they can coach do not cover concussion or any other elements of first aid. Those courses seek to keep grassroots sport running by introducing newcomers to the basics of coaching (Scottish FA, no date 2) and the only pre-requisite for taking them is a short e-learning course on children’s wellbeing (Scottish FA, no date 3). It is more surprising that none

of the other components in the coaching pathway (Scottish FA, no date 4) covers first aid either, but neither do the three levels of UEFA coach licensing that those domestic pathways feed into (Scottish FA, no date 5). There may be variations in other countries' pathways and in other sports, but within all levels of Scottish football coaching is delivered separately from first aid. This approach is entirely at odds with the apparent realities of the grassroots game, where there are often not enough volunteers for coaches and first aiders to be different people, and one wonders where coaches are expected to gain the knowledge on concussion that they are expected to have, but it reflects a model whereby an international sports federation develop the rules and national bodies implement them with little sensitivity to local conditions.

While it is possible for a coach to never take a first-aid course, there are ample opportunities for them to do so through the Scottish Youth FA's first-aid programme and the National Sports First Aid Course which runs under the SFA Continuous Coach Development (CCD) pathway and appears to include a concussion component (Hampden Sports Clinic, no date). The SYFA first aid page is emblematic of the concern, however: the *If in Doubt* booklet is provided on it, but there is no further information or links to concussion-specific courses, so coaches are given the opportunity to read it but are largely left to their own devices about how they use that information. That being the case, it might almost be better if they are not aware of it at all.

The interview data suggested three key areas for urgent further reflection, two of which have a significance that will go beyond concussion as governments and sports inevitably rethink the relationship between physical activity, volunteers and public health post-COVID. First, the impact that the undoubted discrepancy in funding and other resources between girls' and boys' participation needs to be explored and ameliorated. Second and relatedly, the consequences of the gulf between performance sport and recreational participation likewise demands further scrutiny because ultimately 'the game' is not important - the child's health and wellbeing is. Third, there is a pressing need to re-visit the purpose of *If in Doubt* to emphasise the importance of utmost caution and decide how the core message can be better communicated to coaches and other stakeholders. At its simplest, if a volunteer coach considers that an injury requires her to reflect on whatever concussion knowledge she thinks she has, that should suffice: the level of doubt that *If in Doubt* should require has been reached. An equally simple message is conveyed in the new heading guidelines and perhaps *If in Doubt* can draw on that approach.

Beyond those areas, there is a clear need for greater proactivity on the part of the government and the sports bodies who committed to *If in Doubt* with great fanfare in 2018. Ensuring that

coaches are at least aware of its existence and properly emphasising the simplicity of the central message are urgent first steps, while better long-term strategies for education and dissemination are developed. At the moment, the limited conclusions that one can draw from a handful of semi-structured interviews suggests that, in the country's most popular and best-resourced team sport at least, the goal is being missed. The post-COVID sporting and public health environments will at least afford an opportunity to devise and implement strategies for better addressing those and other public health aims through sports rather than perceiving concussion in isolation and having a situation where the people who are expected to be aware of recognition and responses are in blissful ignorance.

Finally, nothing in this paper should discourage people from playing sport or from encouraging children to play, especially in a country where physical activity levels are desperately low (Rowe, 2019) and activity among girls and women is a particular concern (SportScotland, 2015). They are at far greater risk of head injuries in the home or on the street, or during the car journey to the venue.

Acknowledgements

This research was funded by a Royal Society of Edinburgh Arts and Humanities Small Grant Award. We would like to thank the funders, the grant referees and the reviewers of this paper. Special thanks, of course, to the interviewees.

References

Allen, Justine and Mike Bartle (2014). 'Sport event volunteers' engagement: management matters' *Managing Leisure* 19(1): 36-50.

Aubry, Mark, Robert Cantu, Jiri Dvorak, Toni Graf-Baumann, Karen Johnston, James Kelly, Mark Lovell, Paul McCrory, Willem Meeuwisse, Patrick Schamasch (2002). 'Summary and agreement statement of the first international conference on concussion in sport, Vienna 2001' *The Physician and Sports Medicine* 30(2): 57-63.

Auld, Christopher, Graham Cuskelly and Russell Hoye (2006). *Working with Volunteers in Sport: Theory and Practice* London: Routledge.

BBC (2017). 'Alan Shearer: dementia, football and me', 13th November, https://www.youtube.com/watch?v=vMoDtIJ_b8I.

Bey, Tareg and Brian Ostick (2009). 'Second impact syndrome' *Western Journal of Emergency Medicine* X(I): 6-10.

Cantu, Robert (1998). 'Second impact syndrome' *Clinical Journal of Sports Medicine* 17(1): 37-43.

Davis, Gavin, Richard Ellenbogen, Julian Bailes, Robert Cantu, Karen M Johnston, Geoffrey Manley, Shinji Nagahiro, Charles Tator, Paul McCrory (2018). 'The Berlin International Consensus Meeting on concussion in sport' *Neurosurgery* 82(2): 232-236.

De Martini, Anne, Sungwon Kim, Daniel Connaughton, David McArdle (2021). 'A comparison of US and Scotland youth soccer coaches' legal consciousness regarding concussion safety regulations' *International Journal of Sports Science and Coaching* (forthcoming).

Di Virgilio, Thomas, Angus Hunter, Lindsay Wilson, William Stewart, Stewart Goodall, Glyn Howatson, David Donaldson and Magdalena Ietswaart (2016). 'Evidence for acute electrophysiological and cognitive changes following routine soccer heading', *EbioMedicine* 13: 66-71.

FIFA (2020). 'Five substitutes option temporarily allowed for competition organisers' <https://www.fifa.com/who-we-are/news/five-substitutes-option-temporarily-allowed-for-competition-organisers>. Accessed 10 June 2020.

Findlay-King, Lindsay, Geoff Nichols, Deborah Forbes and Gordon MacFadyen (2018). 'Watching the pennies and the people: how volunteer-led sports facilities have transformed services for local communities' *Managing Sport and Leisure* 23(4): 277-293.

Hampden Sports Clinic Sports (no date) 'Concussion', <https://www.hampdensportsclinic.com/projects/CONCUSSION/>. Accessed 10 June 2020.

Hart, Simon (2015) 'Jeff died not knowing he'd been a footballer' *The Independent* 9th April 2015, <https://www.independent.co.uk/sport/football/news-and-comment/jeff-astle-feature-jeff-died-not-knowing-hed-been-a-footballer-10166214.html>. Accessed 10 June 2020.

Kim, Sungwon and Daniel Connaughton (2020) 'Youth soccer parents' attitudes and perceptions about concussions' *67 Journal of Adolescent Health* (forthcoming)

Kim, Sungwon, Daniel Connaughton, John Spengler and Jong Hoon Lee (2017). 'Legislative efforts to reduce concussion in youth sports: an analysis of state concussion statutes' *Journal of Legal Aspects of Sport* 27(2): 162-186.

Macrae, Eilidh (2017). 'Delivering sports participation legacies at the grassroots level: the Voluntary Sports Club of Glasgow 2014' *Journal of Sports Management* 31(1): 15-26, p 15.

May, Todd, Lisa Foris and Chester Donnally (2020). 'Second Impact Syndrome' *StatPearls*, available at <https://www.ncbi.nlm.nih.gov/books/NBK448119/>

McCrea, Michael, Thomas Hammeke, Gary Olsen, Peter Leo and Kevin Guskiewicz (2004). 'Unreported concussions in high school football Players' *Clinical Journal of Sports Medicine* 14(1): 13-17.

McCrory, Paul, Willem Meeuwisse, Mark Aubry, Robert Cantu, Jiří Dvořák, Ruben Echemendia, Lars Engebretsen, Karen Johnston, Jeffrey Kutcher, Martin Rafferty, Allen Stills, Brian Benson, Gavin Davis, Richard Ellenbogen, Kevin Guskiewicz, Stanley Herring, Grant Inverson, Barry Jordan, James Kissick, Michael McCrea, Andrew McIntosh, David Maddocks, Michael Makdissi, Laura Purcell, Margot Putukian, Kathryn Schneide, Charles Tator, Michael Turner (2013). 'Consensus statement on concussion in sport: the 4th International Conference on Concussion in Sport held in Zurich, November 2012' *British Journal of Sports Medicine* 47(5): 250-258.

McCrory, Paul, William Meeuwisse, Jiří Dvořák, Mark Aubry, Julian Bailes, Steven Broglio, Robert Cantu, David Cassidy, Ruben Echemendia, Rudy Castellani, Gavin Davis, Richard Ellenbogen, Carolyn Emery, Lars Engebretsen, Nina Feddermann-Demont, Christopher Giza, Kevin Guskiewicz, Stanley Herring, Grant Iverson, Karen Johnston, James Kissick, Jeffrey Kutcher, John Leddy, David Maddocks, Michael Makdissi, Geoff Manley, Michael McCrae, William Meehan, Shinji Nagahiro, John Patricios, Margot Putukian, Kathryn Schneider, Allen Stills, Charles Tator, Michael Turner, Pieter Vos (2017). 'Consensus statement on concussion in sport: the 5th International Conference on Concussion in Sport held in Berlin, October 2016' *British Journal of Sports Medicine* 51(21): 1557-1558.

Murrie, Ewan (2016). 'Scottish youth football body reviews header guidelines' BBC News, 26 February, <https://www.bbc.co.uk/news/uk-scotland-37779003>. Accessed 10 June 2020

Rieger, Brian, Lawrence Lewandowski, Heather Potts, Kyle Potter and Lawrence Chin (2018). 'Parent knowledge and perceptions of concussion related to youth football' *Cureus* 10(3): e2268.

Rowe, Nick (2019). *Sports Participation in Scotland: Trends and Future Prospects* Edinburgh: Observatory for Sport in Scotland.

Saldana, Johnny (2016). *The Coding Manual for Qualitative Researchers* Los Angeles: Sage.

Scottish FA (no date 1). 'Club academy Scotland' <https://www.scottishfa.co.uk/performance/club-academy-scotland/>. Accessed 10 June 2020

Scottish FA (no date 2). 'Introduction to children's coaching' <https://www.scottishfa.co.uk/football-development/coaching/coaching-pathway/main-youthadult-pathway/introduction-to-coaching/>. Accessed 10 June 2020

Scottish FA (no date 3). 'Child wellbeing' <https://www.scottishfa.co.uk/football-development/coaching/coaching-pathway/specialist-courses/child-wellbeing/>. Accessed 10 June 2020.

Scottish FA (no date 4). 'Introduction to youth/adult coaching' <https://www.scottishfa.co.uk/football-development/coaching/coaching-pathway/main-youthadult-pathway/c-licence/>. Accessed 10 June 2020.

Scottish FA (no date 5). 'Continuing coach development' <https://www.scottishfa.co.uk/football-development/coaching/become-a-coach/continuous-coach-development-ccd/>. Accessed 10 June 2020.

Scottish FA (2018). 'Concussion management guidelines updated' <https://www.scottishfa.co.uk/news/concussion-management-guidelines-updated>. Accessed 10 June 2020

Scottish FA (2020). 'Scottish FA heading guidelines' <https://www.scottishfa.co.uk/football-development/participation/childrens-youth-football/heading/>. Accessed 10 June 2020

Scottish Youth FA (no date). 'First aid' <https://www.scottishyouthfa.co.uk/images/document-downloads/first-aid/syfa%20training%20of%20first%20aiders.pdf>. Accessed 10 June 2020

Shaw, Sally (2009). 'It was all 'Smile for Dunedin!' Event volunteer experience at the 2006 New Zealand Masters Games' *Sport Management Review* 12: 26-33.

Shedden, Sam (2020). 'Scottish FA bans children under 12 heading footballs' *The Scotsman* 24 February.

Slater, Matt (2015). 'Concussion: If in Doubt, Sit Them Out' guidelines from FA' BBC News, 24 November, <https://www.bbc.co.uk/sport/football/34906188>. Accessed 10 June 2020

Spindler, George and Louise Spindler (1992) 'Cultural process and ethnography: an anthropological perspective.' In Margaret LeCompte, Wendy Millroy, W and Judith Preissle Eds. *The Handbook of Qualitative Research in Education* San Diego: Academic Press.

SportScotland (2005) *Making women and girls more active: a good practice guide* <https://sportscotland.org.uk/documents/resources/makingwomenandgirlsmoreactive.pdf>.

Accessed 10 June 2020

SportScotland (2018). *If in Doubt, sit them out* available at <https://sportscotland.org.uk/media/3382/concussionreport2018.pdf>.

Wigmore, Tim (2018). 'FIFA urged to bring in concussion substitutes by medical chief of global footballers' union' *The Telegraph* 24 November, <https://www.telegraph.co.uk/football/2018/11/24/exclusive-fifa-urged-bring-concussion-substitutes-medical-chief/>. Accessed 1⁰ June 2020.