Concussion and Head Injuries in Context. A Mixed-Methods Inquiry of Stakeholder Knowledge, Management, Culture, and Practitioner Experience in Scottish Professional Football.

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ABSTRACT

Concussion and head injuries has emerged as a pressing health issue in contact sports, with increasing scrutiny on the long-term neurological consequences of head trauma. Despite national policy developments and growing public awareness, there remains a limited understanding of how concussions and head injuries are recognised, interpreted, and managed across the multiple stakeholder groups involved in Scottish football – including players, coaches, parents, and performance staff. This PD in Applied Sport and Exercise Science investigates the complexities of concussion and head injury management in Scottish professional football through a practitioner-led, mixed-methods inquiry. Against a backdrop of increasing concern around concussion and head injuries in sport, this Doctorate explores how stakeholders understand, respond to, and manage concussion and head injuries, paying particular attention to the cultural, organisational, and ethical dynamics that shape football practices in the real world. This Doctorate was also shaped by the author's dual role as a practitioner and researcher within an elite football setting, enabling a deep insight into both the formal and informal processes that govern concussion care. This PD unfolds through a qualitatively dominant mixed-methods design, comprising three interlinked studies.

The aim of Study 1 (Chapter 4) was to survey key stakeholders across Scottish professional football to examine their knowledge of concussion symptoms, their understanding of management protocols, and their decision-making in head injury scenarios. Study 1 was a cross-sectional survey design comprising three core sections: (1) general knowledge-based questions, (2) signs and symptoms recognition, and (3) scenario-based decisions regarding return-to-play. The survey was distributed online and completed by 333 participants: players (n = 160), parents (n = 91), coaches (n = 49), and performance staff (n = 33). The results from this study indicated that while most participants had a general awareness of concussion as a

serious health concern, considerable variation existed in symptom recognition and confidence with protocol adherence. For example, although dizziness, confusion, and headache were widely recognised symptoms, less common symptoms such as sleep disturbances and emotional irregularities were frequently missed. Over half of the participants in the players group reported having sustained a head injury, yet 52.5% of the players who participated stated they had never received formal information or education on the subject. Similarly, with the coaches, 30.6% had not received any training in concussion protocols, and a concerning number of parents (78%) reported having no head injury education, despite being key figures in post-incident observation and decision-making. Scenario-based responses revealed confusion around when it is safe to RTP, with frequent inconsistencies between knowledge and decision-making. Players and parents in particular showed a tendency to underestimate the severity of mild symptoms, whereas performance staff were more forthcoming in their responses, likely reflecting their greater formal training. Notably, a large proportion of respondents across all groups were unaware of their club's formal concussion policy or its return-to-play criteria. These findings highlight the critical need for standardised, role-specific concussion education and for greater communication within clubs regarding policy enforcement and best practice.

The aim of Study 2 (Chapter 5) was to explore the lived experiences and organisational practices surrounding concussion and head injury management within a single professional Scottish FC. Using a qualitative case study design, semi-structured interviews were conducted with 17 participants representing five stakeholder sub-groups: players (n = 4), coaches (n = 5), parents (n = 5), and performance staff (n = 3). Interviews were analysed using inductive thematic analysis, focusing on how concussion is managed in real-time, and how club pressures and cultural norms influence behaviour. The results from this study revealed a consistent theme of "lack of knowledge" across all participant groups. Coaches and parents commonly expressed

uncertainty about their roles and responsibilities in concussion incidents, often deferring to others or relying on personal judgment rather than established protocols. Coaches acknowledged that, despite having received some formal education, much of their decision-making relied on experience and instinct. Parents, meanwhile, voiced a lack of confidence in identifying symptoms and were often unaware of how long a player should rest or when to seek medical advice. Performance staff demonstrated greater knowledge but described limitations in standardised implementation due to ambiguities in role boundaries and resource constraints. Organisational culture was marred by implicit expectations to prioritise performance over welfare, leading to subtle forms of protocol avoidance or efforts taken to minimise the risk. Several participants described examples of returning players to training prematurely due to match-day pressures or insufficient time to follow staged recovery guidelines. Coaches felt conflicted when balancing care for the player with pressures to maintain team competitiveness. These findings highlight how the lack of education contributes to inadequate concussion management. The interviews also revealed that communication between stakeholder groups was often fragmented, leading to confusion and missed opportunities for consistent care.

The aim of the final study – Study 3 (Chapter 6) – was to build on the themes identified in the previous studies by offering a reflexive, insider account of the ethical and emotional tensions involved in concussion care. This study adopted an autoethnographic approach, providing a first-person narrative of the researcher's lived experience managing concussion rehabilitation as an applied sport and exercise scientist embedded within a professional Scottish FC. Drawing on field notes, observational data, informal staff conversations, and personal reflections, the autoethnographic account explored how concussion was managed behind the scenes, outside the view of formal reporting or policy. Central themes included ethical conflict, role ambiguity, and emotional labour. The autoethnography also illustrated the constraints faced by non-medical practitioners in implementing head injury protocols. Despite having knowledge and

concern, the researcher's influence was often marginalised by hierarchical decision-making structures or unspoken norms that discouraged challenging authority. This study contributed a unique insight into concussion care and demonstrated the importance of critically examining practitioners' voices, emotions, and ethical judgements within the culture of performance sport. It also emphasised the importance of qualitative methodologies, such as autoethnography, for capturing the lived complexities of managing health risks in high-performance environments.

A meta-thematic integration process was conducted to synthesise findings across all three studies. Areas of convergence included a shared understanding of key concussion symptoms and a collective recognition of the seriousness of the issue. Divergences were evident between reported knowledge and observed behaviours, with some stakeholders demonstrating high cognitive awareness but failing to apply it in practice. Complementary insights emerged from the alignment between the autoethnographic reflections and the interview data, particularly in relation to institutional silence, implicit norms, and emotional labour, all of which are shaped by the five dominant themes: knowledge-practice gaps, cultural pressures, education gaps and inequity, role ambiguity and hierarchy, and communication breakdowns.

The overarching contribution of this thesis lies in its ability to bridge the gap between scientific knowledge and applied practice. By situating concussion management within the lived context of Scottish professional football, the research challenges the view that concussion protocols are purely medical or educational issues. Instead, it positions concussion care as a relational, culturally embedded process requiring ethical attentiveness, interdisciplinary dialogue, and systemic change. The findings suggest that improving concussion outcomes necessitates not only enhanced education but also cultural transformation at club and organisational levels.

This Doctorate also holds significance from a practitioner development standpoint. The methodological journey from quantitative survey to reflexive autoethnography mirrors the

researcher's own transition to a reflective practitioner. The research process catalysed a critical engagement with professional identity, epistemological assumptions, and the emotional demands of care in high-performance sport. As such, the thesis contributes to the growing field of practitioner-led research in sport science and reinforces the value of reflexivity, positionality, and methodological pluralism in applied doctoral work.

In conclusion, this PD offers a practice-informed, context-sensitive exploration of concussion management in Scottish professional football. It advances knowledge on stakeholder perceptions, organisational culture, and ethical practice, whilst also demonstrating the utility of mixed-methods research in capturing the complex interplay of factors that shape concussion care. The thesis provides actionable recommendations for practitioners, policymakers, and educators, including the need for tailored training programmes and stronger interdisciplinary collaboration. These insights are timely and relevant, particularly as Scottish football continues to grapple with the long-term health implications of head injury and the ethical responsibility to protect players' wellbeing.

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First and foremost, I would like to express my sincere gratitude to my Project Supervisor, Dr Simon Roberts, for his unwavering support, guidance, and encouragement throughout this doctoral journey. His insight, patience, and commitment to both academic excellence and personal development were invaluable, and I am deeply grateful for his mentorship.

I would also like to thank all of the participants who contributed to this research – the parents, players, coaches, and performance staff for generously giving their time and sharing their experiences, whether it was through completing the survey, participating in the interviews or playing an essential role in my autoethnography to help contribute to the overall thesis. Their insights were vital to the success and integrity of this Doctorate, and their input helped shape its direction and added depth and relevance to the findings.

To my family, especially my Mum, Dad, and brother. I want to thank them for their support, patience, and belief in me. Their constant encouragement and understanding made this journey possible, and their support was felt at every step.

Finally, I would like to dedicate this PD achievement to my Mum. My project was put on hold whilst my Mum went through major cancer treatment and her strength, positivity, and resilience throughout has been a constant source of inspiration. Her determination in the face of adversity has motivated me to persevere through my own challenges and to see this journey through to completion as well as shaping the person and practitioner I continue to become. This work reflects her courage.

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LIST OF SYMBOLS AND ABBREVIATIONS

=	Equals
<	Less than
>	More than
%	Percentage
n	Sample size
BASES	British Association of Sport and Exercise Science
CP	Cerebral Palsy
CONT	Control Group
FA	Football Association
FC	Football Club
F-MARC	FIFA Medical Assessment and Research Centre
HPSA	High Performance Sport Accreditation
JISC	Institutional Online Software
LJMU	Liverpool John Moore's University
PD	Professional Doctorate
PFA	Professional Footballers' Association
PhD	Doctor of Philosophy
RDF	Vitae Researcher Development Framework

RoCKAS	Rosenbaum Concussion Knowledge and Attitudes Survey
RTP	Return to Play
SCAT5	Sport Concussion Assessment Tool – 5th Edition
SFA	Scottish Football Association
SPFL	Scottish Professional Football League
SPSS	Statistical Package for Social Sciences
SR	Simon Roberts (Lead Supervisor)
S&C	Strength and Conditioning
TBI	Traumatic Brain Injury
UEFA	Union of European Football Associations
UK	United Kingdom
VAR	Video Assistant Referee

GLOSSARY OF TERMS

Concussion	A concussion is a type of mild traumatic brain injury caused by a blow to the head or body that makes the brain move quickly inside the skull.
Head Knock	A head knock is a general, non-medical term used to describe any hit to the head. It does not automatically mean a concussion has occurred.
Head Injury	A head injury is any injury to the head. It can range from minor cuts or bruises to more serious injuries involving the brain, such as a concussion.

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CHAPTER ONE.

GENERAL INTRODUCTION.

1.1 General Introduction

Liverpool John Moores University's PD (PD) programme was created to enable an individual to further develop as a researcher and professional practitioner. This enhances the practitioner's ability to build on their applied practices and competencies by exploring current practices utilised in their applied settings. In turn, this enables a detailed, well-structured professional development (PD) plan to be devised to further advance their professional and academic practices. The PD programme is divided into two sections – researcher development and professional development. This introduction will identify aims and objectives from both a professional and research development perspective.

1.2 Professional Background

My motivation for enrolling on a PD, rather than a traditional PhD, was to acquire new skills and knowledge whilst working within the professional practice of elite Scottish football. By following this route, I was able to apply my studies to enhance my professional development and secure full-time employment in professional football.

I have been a Sport Scientist and Strength and Conditioning Coach in elite First Team and Academy football for approximately ten years, and my qualifications and experience have equipped me with the knowledge of the physical, technical, and tactical demands required to be a sport scientist in professional football. In my role, I am responsible for player monitoring, return-to-play assessments and liaising with medical teams to ensure holistic player health. These responsibilities often place me at the intersection between performance demands and medical best practices. Practical challenges faced as an applied practitioner became a key motivator for further exploration of this issue through doctoral research. The skills and knowledge I have gained from my applied practice across different levels of Scottish FCs will enable me to develop an appropriate concussion and head injury management framework.

Since taking up my position at a professional SFA club, the SFA have been proactive in providing guidance and support surrounding head injuries. However, the translation of this work into professional practice remains largely unexplored, and there is limited evidence on the role of performance coaches in relation to concussion and head injury management. I am confident that the knowledge and experience gained from the PD will benefit me as an applied practitioner. See Figure 1 below for my career path within Scottish FCs to date.

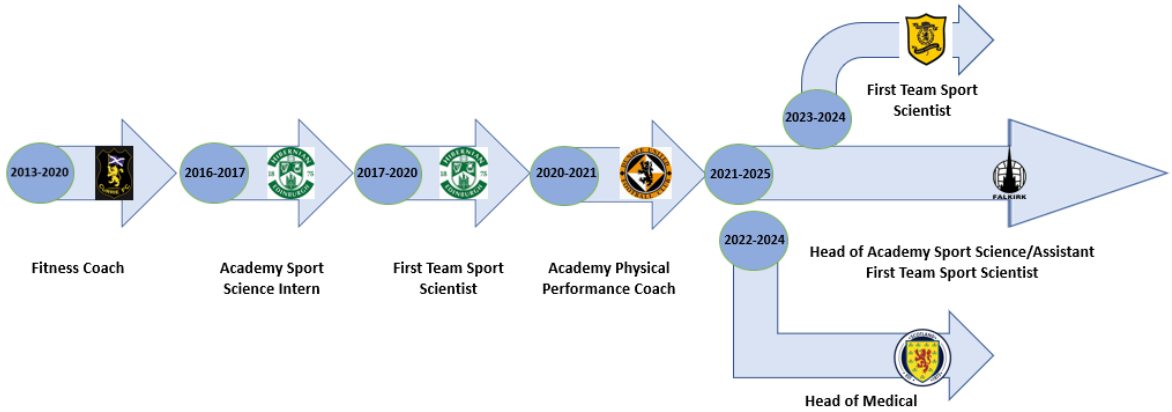


Figure 1.1 Career pathway to date.

1.3 Professional Aims and Objectives

The professional development aims of this PD are to enhance my personal effectiveness, engagement, influence, and impact as an applied sports practitioner in a professional football environment. These areas were identified using the PD Self-reflection module from the industry tool Vitae Researcher Development Framework (2005). The specific objectives that will guide this aim include:

1. Keep up to date with current literature.
2. Improve my career prospects.
3. Improve my confidence.

1.4 Research Background

Association Football (Soccer) is a unique team sport, as it is the only sport in which players actively use their unprotected heads to control and play the ball down the field or to score a goal (Spiotta, 2012; Maher et al., 2014). In other sports, i.e., Formula One racing, the driver's heads are protected to prevent them from suffering any head trauma, whereas in football, there is no such protection. Comparative research from North American contexts (e.g., NCAA and NFL protocols) has demonstrated how structured concussion and head injury management frameworks, backed by policy and legal enforcement, can significantly reduce incidents of mismanagement (Kroshus et al., 2015). However, Scottish football lacks such standardisation, where education and enforcement are inconsistent. This raises important questions about cultural norms in sport, knowledge transfer, and how institutional priorities shape health-related behaviours. Applying concepts from the Health Belief Model (Rosenstock, 1974), it is possible to conceptualise stakeholders' varied behaviours as influenced by perceived susceptibility, perceived severity, and cues to action, all of which are shaped by their cultural and organisational environment. During a football match, an average player can head the ball 6-12 times (Spiotta, 2012). However, during training sessions, headers are less common and when they do occur, they are at much lower speeds (Rodrigues, Lasmar & Caramelli, 2016). Heading a ball involves repeated impacts, acceleration–deceleration of the brain, and possible rotation of the brain, which can damage brain cells (Basinas, 2022). The effects of a repetitive minor injury may not manifest for many years. Therefore, pathological evidence of a traumatic brain injury is likely to present before the onset of symptoms or disability.

There is long-overdue evidence currently emerging to raise awareness surrounding the importance of concussion and head injury management in Scottish football (Sportscotland, 2018). However, there is limited/no literature available within Scottish football on how much sport science/strength and conditioning training are involved in minimising and preventing

heading injuries. This is a worrying situation, given the rapid growth in interest in this phenomenon. Some research does suggest there is evidence to reduce head injuries. For example, to counter external forces to the head during impact, players must prepare for impact by bracing the neck by moving the entire body in one motion (Janda & Cheney, 2002). However, this is not commonly known/taught within football at any level.

Current research is inconsistent regarding the effects of immediate and long-term heading exposures and whether they can lead to any complications later in a player's life (Rutherford, Stewart, & Bruno, 2019). Possible complications of heading the ball depend on the rate of exposure, the time between exposures, and the vulnerability of each player (Lipton et al., 2013). There is limited literature monitoring the potential long-term consequences of head injuries (Rodrigues, Lasmar, & Caramelli, 2016), especially within the youth development setting where the players' brains are still developing (Harriss, Johnson, Walton, & Dickey, 2018). As a result of these uncertainties and concerns about concussion and head injuries, rules and regulations have now been implemented to minimise the number of headers among youth players aged 14 and below (e.g., UEFA 2020), with the SFA having set its own rules for players aged 12 and below. A recent study investigated whether heading the ball should be banned in children's football (Tarnutzer, 2017) to help minimise potential long-term complications. However, due to insufficient evidence to support the ban, a strategy has instead been introduced for heading training. Based on current literature, further investigation is required into appropriate head injury management frameworks to minimise any immediate and potential long-term complications.

Head injuries occur in many sports, including football (Metzl & Micheli, 1998) and account for 15% of football injuries resulting in hospital emergency department admissions. Most head injuries occur in young players when they are aged between 10 and 14 (50%), and the lowest proportion is for 15 – 19-year-olds (23%) (Giannotti, Al-Sahab, McFaull, & Tamim, 2010).

Although football is not traditionally considered high-risk for head injuries, football players are prone to traumatic brain injuries, and up to 22% of all football-related injuries are head injuries (Covassin, Swanik, & Sachs, 2003). The current head injury literature creates misunderstandings about the rules and regulations for coaches, parents, and players.

There are several warning signs and symptoms associated with head trauma i.e., headaches, dizziness, sickness, blurred vision, memory/balance disturbances or loss of consciousness (McCrory et al., 2013) but evidence would suggest that practitioners i.e., coaches/assistant coaches were not aware of all of these symptoms or how they should be managed (Rieger et al., 2018). Concussion and head injuries can occur at any age. Still, young children aged under fourteen are more susceptible, can take longer to recover and are more at risk of long-term neurological complications (Harriss, Johnson, Walton & Dickey, 2018). This is because their brain is still developing, and research suggests that brain development does not stop until the age of twenty-five (Pujol et al., 1993).

To help reduce the number of head injuries, heading the ball cannot be taught to young players under 12 in Scottish youth football. Beyond that age, heading the ball should remain a low coaching priority. Coaches are instructed to focus on fundamental movement skills, which could ultimately improve a player's technical and tactical abilities. If any signs or symptoms of a head injury are presented, the player should be removed from training or the match immediately.

1.5 Research Aims and Objectives

There is currently limited research exploring stakeholder (parents, players, coaches, and performance staff) perceptions of head injury management in Scottish professional football. The research aim of this PD is to work with these stakeholder groups and design, implement

and evaluate a head injury management framework within a professional football setting. To achieve this aim, the following objectives are presented:

1. To examine parents, players, coaches, and performance staff's current perception and knowledge of strategies for dealing with concussion and head injuries.

2. To examine key stakeholder perspectives on the effectiveness of current concussion and head injury protocols from an interdisciplinary perspective at a single SFA club.

3. To use key stakeholder feedback to design and develop an integrated concussion and head injury intervention framework within a single SFA club.

4. To evaluate an integrated concussion and head injury management framework at a single SFA club.

These objectives align with recent calls for more practice-oriented concussion research that not only evaluates protocol knowledge but also interrogates the lived realities of those tasked with enforcing them (Williams et al., 2016). Furthermore, given my embedded role within a FC, a critical component of this research was to explore how cultural expectations and ethical dilemmas intersect with head injury management.

CHAPTER TWO.

OVERVIEW OF LITERATURE.

Concussion and Head Injuries: A Growing Concern.

2.1 Overview of Literature

This chapter critically reviews current literature on concussion and head injuries in football, with a focus on player safety, stakeholder education, and reporting practices. The review identifies gaps in knowledge, inconsistencies in awareness and barriers to effective injury management. It provides the conceptual foundation for this PD, which, together, aims to address these challenges from multiple stakeholder and practitioner perspectives.

2.2 Concussion and Head Injuries: A Growing Concern

Traditionally, concussion and head injury research has been dominated by medical and neuropsychological disciplines, with sport science playing a relatively minor role (McCrory et al., 2017; Broglio et al., 2014). This means that much of the existing literature has focused on clinical diagnostics, return-to-play protocols, and neurocognitive outcomes, often without sufficient consideration of how these findings translate into the day-to-day realities of sport practitioners and sporting environments (Putukian, 2016). For example, while medical texts provide detailed criteria for concussion identification (McCrory et al., 2017), they rarely address how knowledge is communicated between coaches, players, and support staff in the background. This gap is significant, as the success of any medical protocol in sport ultimately relies on its adoption by non-medical personnel (Kroshus et al., 2015). As a sport scientist, this thesis attempts to bridge that gap by examining concussion as both a clinical and cultural issue.

Public awareness of concussion and long-term neurological risk in football has increased significantly in recent years, largely driven by high-profile cases involving former professional players. In the UK, the deaths of former footballers such as Jeff Astle and Gordon McQueen brought substantial media attention to the potential relationship between repeated head impacts and neurodegenerative disease. The case of Jeff Astle in particular prompted the coroner to

attribute his death to chronic traumatic encephalopathy (CTE) linked to repeated heading of the ball during his playing career, generating widespread public debate regarding the safety of heading in football. Similarly, the later diagnosis of dementia in Gordon McQueen further reinforced concerns regarding long-term brain health among former footballers. These cases contributed to increasing scrutiny from the media, policymakers, and governing bodies regarding concussion management and head impact exposure within football (Mackay et al., 2019).

Scientific research in football has seen significant growth in recent years (Kirkendall, 2020). An increase in the volume of research available to practitioners, coaches, and players has contributed to the increased physical and technical demands of modern football (Barnes et al., 2014). While considerable attention has been paid to aspects such as physical performance and player conditioning (Reilly & Gilbourne, 2003), only a small proportion of research has investigated concussion and head injuries within football. This is a notable gap, particularly considering the extensive body of research and policy development dedicated to head injuries in high-impact sports such as rugby (World Rugby, 2019; McCrory et al., 2017), American football (National Football League, 2020; Guskiewicz et al., 2005), and Formula 1 racing (Fédération Internationale de l'Automobile, 2018). These high-impact sports have implemented structured concussion management frameworks for a longer period. For example, World Rugby introduced the Head Injury Assessment (HIA) protocol, which allows for temporary removal from play and formalised side-line assessment procedures. Similarly, motorsport governing bodies such as the Fédération Internationale de l'Automobile have implemented extensive safety systems designed to minimise head and neck trauma, including the introduction of the Halo cockpit protection system in Formula One racing. These examples demonstrate how concussion management and head injury prevention strategies have been developed across

different sporting contexts, highlighting the importance of robust medical governance structures and proactive safety interventions (McCrory et al., 2017).

Football is unique in that it is the only major sport in which players deliberately use their unprotected heads to control the ball, either to play it or to score a goal (Spiotta, 2012). Spiotta (2012) noted that players can head the ball 6-12 times per match, during which the ball can reach high speeds. Repeated heading, in combination with accidental collisions and falls, raises concerns about both short and long-term head injuries. Alarmingly, there remains a lack of research specific to Scottish football regarding the role of sport science or strength and conditioning interventions in preventing or minimising such injuries. Given the rising awareness and concern surrounding brain health, this knowledge gap is problematic.

Head injuries account for 15% of football injuries resulting in hospital emergency department admissions (Metzl & Micheli, 1998). Although football is not traditionally known as high-risk for head injuries, football players are prone to traumatic brain injuries, and up to 22% of all football-related injuries are concussions and head injuries (Covassin, Swanik, & Sachs, 2003).

Concussions and head injuries account for 8.9% of all athletic injuries among high school athletes (Gourley et al., 2010). However, this figure underestimates the actual figure as athletes under-report concussion and head injuries to allow them to return to training sooner (Thurman, Branche, & Sniezek, 1988). The coach or parent often makes the diagnosis of a concussion or head injury; therefore, coaches and parents must receive appropriate training and encourage the athlete to seek medical advice before returning to training. A pre-season survey identified that 55% of the respondents had previously reported at least one concussion symptom after sustaining a head injury. However, 86% of these respondents did not report a history of concussion (McLeod, Bay, Heil & McVeigh, 2008). An overall increase in concussion and head injury knowledge and in the ability to recognise signs and symptoms is required among

parents, players, coaches, and performance staff members. Recent studies have demonstrated that educational programmes are valuable for increasing knowledge and understanding within these groups (McLeod & Bay, 2007).

2.3 Signs and Symptoms

From a medical perspective, concussion is widely recognised as a form of mild traumatic brain injury resulting from biomechanical forces transmitted to the head. International consensus statements have played a key role in shaping clinical understanding and management guidelines. The Concussion in Sport Group has produced a series of influential consensus statements that provide guidance on concussion diagnosis, assessment, and return-to-play procedures. These statements emphasise that concussion involves functional disturbance rather than structural injury and may therefore not be visible on standard neuroimaging (McCrory et al., 2017). In addition, epidemiological research led by Willie Stewart has demonstrated an increased risk of neurodegenerative disease among former professional footballers, further reinforcing concerns regarding the cumulative effects of repeated head impacts in sport (Mackay et al., 2019).

The clinical signs and symptoms of a concussion and head injury can vary widely but often include physical, cognitive, emotional, and sleep-related disturbances (McCrory et al., 2013). The most common reported symptoms include:

- Physical – headaches, dizziness, nausea or vomiting, blurred or double vision, balance problems, sensitivity to light or noise.
- Cognitive – confusion, difficulty concentrating, feeling mentally foggy, memory problems, i.e., forgetting the events before or after the injury.
- Emotional – irritability, sadness, nervousness, mood swings.

- Sleep-related – drowsiness, sleeping more or less than usual, trouble falling asleep.

Loss of consciousness may occur but is not required for a concussion diagnosis (McCrory et al., 2013). Symptoms typically appear immediately or within minutes to hours after the impact, but delayed onset is also possible (Broglio et al., 2014).

Rieger et al. (2018) found that many coaches and assistant coaches lack the necessary knowledge to identify these symptoms or to manage them effectively. Many lack the training to identify subtle signs or to follow established concussion and head injury protocols. This knowledge deficit can lead to under-reporting or mismanagement, potentially exacerbating neurological risks. Importantly, signs of concussion and head injuries in children may differ slightly from those in adults, and younger athletes may struggle to articulate what they are experiencing (Halstead et al., 2010). Concussions and head injuries can occur at any age, but this is especially concerning in youth football, where younger athletes (under 14) are more vulnerable to long-term neurological complications (Harriss & Dickey, 2018). This is due to their brains still being in development. However, research suggests brain development does not stop until the age of 25 (Pujol et al., 1993).

In response to these risks, significant policy changes have been made in Scottish youth football. Heading is now prohibited for players under 12, and for players over 12, it is deemed a low coaching priority. Instead, coaches are encouraged to focus on fundamental movement skills and technical development (SFA, 2020). Should any concussion or head injury signs or symptoms appear, the player must be removed from training or the match immediately, followed by medical evaluation aligning with best practices (McCrory et al., 2013).

2.4 Awareness and Interventions

Efforts to improve concussion awareness and response behaviour have led to the development of educational interventions. The Rosenbaum Concussion Knowledge and Attitudes Survey (RoCKAS) was designed to address misconceptions, reduce concussion incidence, and identify the need for an academic intervention programme. The RoCKAS study involved twenty-six English championship footballers. A mixed-methods approach was adopted, including a survey and an interview. The survey asked concussion knowledge and attitude questions, whilst the interviews asked concussion knowledge, attitudes, and behavioural questions. It identified that some footballers continued to participate in football despite their concussion symptoms and their failure to report their symptoms. From their findings, the footballers had a moderate understanding and recognition of concussion when assessed using a pen-and-paper test. Still, the interviews highlighted that the footballers had a poor level of knowledge and behaviours around head injuries and appropriate protocols. It is essential that my body of work devises appropriate educational frameworks for players, coaches, parents, sport scientists/strength and conditioning coaches and medical staff to improve concussion reporting behaviours amongst footballers (Williams, Langdon, McMillan & Buckley, 2016).

King et al. (2016) found that parents who had received training scored higher on knowledge assessments than coaches or players. Whilst parents scored higher, their role in decision-making during match play is often peripheral – limiting the practical impact of their knowledge. However, the study's reliance on self-reported data from players raises questions about their depth of understanding and whether this knowledge translates into action in real-life concussion incidents. The tension between knowledge and influence demonstrates a key concern of this thesis: that concussion and head injury cannot rely on awareness alone but must also address organisational dynamics. There is a clear and urgent need for structured educational frameworks tailored to different stakeholder groups in football, including players,

parents, coaches, sport scientists, and medical staff. Frameworks should be evidence-based, age-appropriate, and aligned with current guidelines and protocols. Increasing concussion literacy and embedding protocols within coaching plans and youth development systems may significantly reduce the incidence and possible long-term consequences of concussions and head injuries in football.

2.5 Self-Reporting

The risk of injury is present in all sports, but it is higher in contact or collision sports (Braugh et al., 2019). Many injuries present visible signs that enable a medical professional to identify and diagnose the injury, as well as to remove the individual from training or the game to prevent further damage or injury. However, a concussion or head injury is not always visible (Echemendia et al., 2017). Diagnosis of a concussion or head injury relies heavily on a player reporting their symptoms to reduce the risk of further injury and to minimise recovery time (Asken et al., 2016). Some performance staff members have experienced challenges when treating a concussion or head injury where the recovery treatment had to be adapted due to mismanagement of symptoms (Salisbury et al., 2017). This prevented an accurate diagnosis and the planning and implementation of an appropriate recovery programme.

Self-reported heading measures have been introduced as a convenient method for quantifying the number of headers performed (Harriss et al., 2018). However, the main limitation of this method is that the reported number of headers is inaccurate. This method has also been used to identify whether head injuries can present long-term complications such as adverse neurological outcomes (Lipton et al., 2013). Evidence suggests that repeated heading of a ball can result in decreased cognitive function, including memory and executive planning (Matser et al., 1998, 2001). However, some studies have reported significantly few cognitive changes associated with heading (Webbe & Ochs, 2003).

When self-reporting, evidence suggests that players overestimate the number of headers during a match, training, or season, whereas the gold standard for obtaining accurate data is direct observation (Harriss et al., 2018). Very few self-reporting methods have been validated, and the results assume that players are accurately recording incidences (Catenaccio et al., 2016). It is vital to correctly quantify the number of headers during training or a match to ensure accurate data is captured. Accurate data requires players to correctly recall the number of headers per game (Rutherford & Fernie, 2005). The validity of head injuries using a self-reporting approach is questionable for the same reasons previously mentioned. Reliable measures are required to record any incidents accurately. This can only occur if players correctly report their number of concussions or head injuries, and current literature states this is not always the case.

A recent study explored whether heading the ball is associated with neurological impairments (Harriss et al., 2018). The methods of this study recalled each player's number of headers over an entire season. The researchers observed female youth football players during actual games to count how many times they purposefully headed the ball. Each player then watched several matches with trained observers recording every time a player made a purposeful header. The researchers then compared these self-reports to the actual observed counts to see how accurate the players' estimates were. Their results demonstrated that all players overestimated their self-reporting by 51%. Despite this being a convenient and easy method of capturing data, any results should be interpreted with caution.

Studies have identified that there is often a delay in reporting signs and symptoms of a concussion or head injury amongst players. There are several reasons for this, but the main ones include not believing the injury was severe enough to warrant reporting and uncertainty about whether it was a concussion (McCrea et al., 2004). Risk-taking behaviours are often reinforced in players. They gain more experience by playing through injuries, and this way of thinking is usually normalised by the players' coaches (Nixon, 1994). This can ultimately

negatively influence a player's perception of the severity of injuries, including concussion or head injuries.

Studies have explained that the experiences players have after reporting or not reporting a head injury can influence their decision to report any future injuries (Torres et al., 2013). Players do not want to jeopardise their playing careers and may therefore avoid reporting injuries to avoid any playing conflicts. The future development of any self-report model/guide is required to prevent/reduce players from not reporting head injuries, and to highlight the importance of accurately self-reporting this type of injury.

Medical decision making in football is also shaped by ethical and professional responsibilities that prioritise player welfare over competitive performance. Within elite sporting environments, team doctors and medical practitioners operate under professional standards that require them to act in the best interests of the player's health and long-term wellbeing. Consequently, medical staff may assume authority over return-to-play decisions when concussion is suspected, even when this conflicts with the preferences of coaches, players, or competitive pressures. This principle reflects broader ethical obligations within sports medicine, where clinical independence is necessary to ensure that health-related decisions are not compromised by performance-related demands (Putukian, 2016). Such frameworks emphasise that removal from play following suspected concussion represents a precautionary medical decision designed to reduce the risk of further neurological harm.

2.6 Perceptions Surrounding Concussion and Head Injuries

The evolving understanding of concussion and head injuries in football has led to an increased focus on how stakeholders, particularly parents, players, coaches, and medical or performance staff, perceive and respond to these issues. While there is a growing recognition of the risks associated with concussions, inconsistencies remain in both the delivery and content of

concussion education. Feiss et al. (2020) highlighted that there was no standardised, evidence-based curriculum across education programmes for concussion and head injuries in football, resulting in wide variability in awareness and understanding.

In young players, the level of education parents receive is vital, as many head injury signs and symptoms may not appear until hours or even days after the head injury occurred (Feiss et al., 2020). This often means the onus falls on the parents, rather than the coaches and performance staff, to monitor the situation. Despite previous programmes and written information on concussion and head injuries being available, these were primarily aimed at coaches and performance staff, with no specific programmes or information designed solely for parents (Chrisman et al., 2014).

Increased access to educational information on concussion and head injuries, combined with increased media coverage on adverse long-term health outcomes of players that participated in professional contact sports, has led to heightened levels of concern in youth sport stakeholders, especially parents, regarding the potential long-term effects of concussion or head injuries (Schatz et al., 2020). A previous study stated that 71% of parents who have a child playing football have never received any information or education on concussion or head injuries, despite playing a critical part in post-injury monitoring (Mannings et al., 2014).

These concerns are also impacting participation trends. A decline in sports participation has been observed in young athletes prior to the recent attention on concussions. Between 2009 and 2014, 4.5 million fewer children worldwide were playing sports (Langhorst, 2016), with a 5% decrease in high school sport participation documented (King, 2017). The decline in participation numbers is due to various factors, including parents' safety concerns, rising academic pressures, and alternative recreational activities. These inconsistencies in stakeholder education and the variability in parental awareness are further complicated by the way

concussion is socially constructed within football environments. Moreover, the perception of concussion as an “invisible injury” continues to complicate stakeholder responses. Unlike musculoskeletal injuries that present with visible swelling, deformity, or clear functional limitation, concussion and head injuries often lack outward physical signs, leading some parents and coaches to underestimate their seriousness (Kroshus et al., 2015). This invisibility not only contributes to delayed recognition but may also reinforce the tendency to prioritise continued participation over precautionary removal, particularly within competitive settings.

2.7 Players' Perceptions

The perceptions football players hold regarding concussion and head injuries significantly influence their reporting behaviours, treatment adherence, and overall well-being. Despite increased media coverage and gradual improvements in concussion education, many footballers, especially at semi-professional and grassroots levels, continue to underestimate the seriousness of concussion and head injuries (Kroshus et al., 2017). Cultural norms within football often reinforce playing through pain, viewing concussion symptoms as a temporary setback rather than a medical condition requiring structured recovery (Chrisman et al., 2014). This perception is further reinforced by peers, coaches, and performance expectations, particularly in competitive environments where players fear losing their place in the team or being perceived as weak (Kerr et al., 2016).

A recurring theme in literature is that many players possess only a superficial understanding of concussion symptoms and associated risks. Although some may correctly identify common symptoms such as headaches or dizziness, they often lack awareness of less visible or delayed indicators such as emotional disturbances or sleep irregularities (Register-Mihalik et al., 2013). Additionally, many players hold misconceptions that a concussion only occurs with a loss of consciousness, leading to under-reporting and self-diagnosis errors (McCrea et al., 2004). A

qualitative study by O'Connor and Daneshvar (2020) found that whilst elite-level players were more likely to be aware of concussion protocols, their actual adherence to the guidelines depended heavily on how their teammates and coaching staff reacted to the injury.

One of the most prominent barriers to accurate reporting is the perceived consequences of acknowledging a concussion or head injury. Players frequently express concern that reporting symptoms may result in being replaced or substituted, particularly in critical match periods or when contract renewals are at stake (Kerr et al. 2016). These perceived consequences of disclosure do not operate in isolation but are often shaped by players' prior injury experiences. Additionally, players who have previously experienced concussions may begin to normalise the associated symptoms over time, viewing them as an expected or routine aspect of participation rather than as a medical condition requiring structured management (Cusimano et al., 2009). Repeated exposure can reduce symptom salience, particularly when earlier incidents did not result in immediate or severe outcomes, reinforcing a belief that symptoms are temporary and manageable without formal intervention. This normalisation process further complicates accurate reporting and may contribute to cumulative neurological risk, as players become desensitised to early warning signs.

To address these challenges, player-focused interventions must extend beyond knowledge transfer to include behavioural change models. Programmes that incorporate player testimonies, video simulations, and interactive workshops have been found to improve information retention and shift attitudes towards safer practices (Sarmiento et al., 2010). These interventions are most effective when reinforced by supportive coaching environments that prioritise player health over short-term performance gains. Integrating routine discussions and openly addressing the stigma of injury reporting could help foster a cultural shift, ultimately reducing the long-term neurological consequences for footballers across all levels of the sport.

2.8 Coaches' Perceptions

Football coaches play a pivotal role in recognising and managing concussions and head injuries, particularly in youth and amateur settings where access to medical professionals may be limited. However, multiple studies have found that coaches' knowledge and understanding of concussion-related issues are inconsistent and often insufficient to ensure player wellbeing is prioritised (Chrisman et al., 2014; Rieger et al., 2018). While some coaches are proactive and well-informed, others may underestimate the severity of concussions and head injuries or lack confidence in identifying subtle symptoms, particularly those that are cognitive or emotional rather than physical.

Kroshus et al. (2017) examined the concussion-related knowledge and attitudes of high school coaches in the United States. They found that although most had received some form of concussion education, significant knowledge gaps persisted. Many coaches reported uncertainty about how long an athlete should rest post-concussion and lacked familiarity with return-to-play protocols. Moreover, the pressure to maintain team performance, especially in competitive environments, may lead coaches to downplay injury severity or support early returns to play, despite incomplete recovery (Kroshus et al., 2015).

In the context of Scottish football, research specifically exploring coaches' concussion and head injury education and attitudes is sparse, representing a critical gap. Unreliable evidence suggests that many coaches rely on experience-based judgment rather than formal guidelines, which increases the risk of mismanagement. This issue is particularly prominent in grassroots football, where volunteers or part-time coaches may not have access to structured educational resources or first-aid certification. A qualitative study by Taylor and Stryhn (2019) involving semi-professional coaches in the UK revealed that many viewed concussion and head injuries as "part of the game," with a reluctance to remove players unless symptoms were apparent and

immediate. This finding underlines the need for targeted interventions to reshape outdated perceptions and equip coaches with evidence-based decision-making tools.

Broader cultural norms within football also influence coaches' attitudes. Football has historically had a resilient and tough mindset, creating an environment in which both coaches and players may normalise the idea of playing through pain and injuries such as a concussion or head injury. Therefore, any educational initiative must not only increase factual knowledge but also address these deep-rooted cultural factors that shape coaching behaviours.

2.9 Parents' Perceptions

Parents play a pivotal role in recognising, reporting, and responding to concussion and head injury symptoms in youth football players. Their attitudes and knowledge can significantly influence how injuries are managed and whether children RTP prematurely. Yet, studies have revealed considerable variation in parental understanding of concussions and head injuries, often shaped by prior experience, access to information, and personal attitudes toward risk in sport (Lin et al., 2015). Many parents still perceive concussions and head injuries as less severe than other injuries, such as fractures, particularly when there can be no visible symptoms, resulting in under-reporting or mismanagement (Kroshus et al., 2017).

One barrier to adequate parental response is the misconception that concussions only occur from significant impacts or loss of consciousness. In reality, seemingly minor collisions or repetitive sub-concussive events can have cumulative neurological effects (McCrory et al., 2013). Some parents believe that a lack of immediate, dramatic symptoms means their child has avoided injury, despite evidence suggesting that delayed symptoms such as headaches, irritability, or fatigue can emerge hours or days post-impact (Halstead et al., 2010). This lag in symptom onset, combined with a lack of medical training, often places parents in a difficult

position when deciding whether to seek medical assessment or allow their child to continue playing.

In highly competitive environments, parents may minimise injury risks to support their child's aspirations or to maintain team status, inadvertently reinforcing the culture of playing through pain (Sarmiento et al., 2010). However, the heightened fear, driven by media coverage of long-term brain damage in professional footballers, may result in some parents withdrawing their children from football altogether. This illustrates the urgent need for a balanced, evidence-informed education programme specifically tailored to parents.

Recent interventions aimed at improving parental concussion and head injury literacy have shown promising results. Educational programmes delivered through schools or clubs that are interactive and scenario-based enhance parents' ability to identify concussion symptoms and understand return-to-play protocols (Kirkwood et al., 2015). Despite these benefits, access to such education remains inconsistent, especially across lower-resourced clubs or communities, suggesting a need for wider implementation at national and grassroots levels.

Ultimately, fostering a culture of safety in football must include parents as active stakeholders. This requires ongoing, multi-platform educational initiatives, reinforcement through club policies, and collaboration with coaches and healthcare professionals. A unified approach that empowers parents to recognise, report, and manage concussions and head injuries effectively will not only improve individual outcomes but also contribute to broader efforts to make football a safer sport for all participants.

2.10 Performance Staff's Perceptions

Performance staff members play a vital role in the identification, management, and prevention of concussion and head injuries in football. Their perceptions and understandings of these

injuries significantly influence player safety outcomes and the implementation of appropriate protocols. However, recent literature suggests that despite their integral role, many performance staff members exhibit gaps in concussion and head injury knowledge and awareness, which can lead to inconsistent management practices (Broglio et al., 2014; Rieger et al., 2018).

A recurring theme in studies exploring staff perceptions is the tension between performance demands and injury risk management. Performance staff are often under pressure to maintain player availability and optimise physical conditioning, which can sometimes conflict with concussion and head injury management protocols that require extended rest and gradual RTP (Cusimano et al., 2017). This dual responsibility can lead to minimisation or underestimation of concussion symptoms, particularly when players themselves downplay injuries, creating a challenge for staff to balance short-term performance goals with long-term health considerations (Putukian, 2016).

Moreover, the depth of concussion and head injury knowledge amongst performance staff varies widely, and is influenced by factors such as professional background, level of formal education, and access to up-to-date training resources. Studies by McCrory et al. (2017) and Davis et al. (2018) found that while most staff members understand the basic symptoms of concussion and head injuries, there remains confusion regarding less obvious signs such as cognitive or emotional disturbances. This can result in failure to recognise subtle or delayed symptom onset, which is critical given that symptoms may evolve hours or days post-injury (Halstead et al., 2010). Importantly, some performance staff members report feeling inadequately trained to manage concussion and head injuries effectively, expressing the need for more structured, ongoing education, specific to their role within football (Williams et al., 2016).

In addition to knowledge gaps, cultural factors within football environments contribute to how concussion and head injuries are perceived by performance staff. The "win-at-all-costs" mentality can implicitly discourage strict adherence to concussion and head injury protocols (Kroshus et al., 2014). Performance staff often navigate these cultural pressures, balancing medical caution with expectations from coaches, players, and club management. This dynamic may inadvertently lead to compromised concussion management and the increased risk of repeated injury (Meehan et al., 2013). Addressing this requires not only improved education but also a shift in football culture to prioritise player welfare over immediate performance outcomes.

To mitigate these challenges, research advocates for the development of tailored concussion and head injury education programmes for performance staff that integrate scientific knowledge with practical application within the football context (Williams et al., 2016; Feiss et al., 2020). Such programmes should emphasise early symptom recognition, effective communication with medical personnel, and a supportive environment in which players feel free to report injuries without fear of negative consequences. Additionally, embedding concussion and head injury protocols within routine training and recovery practices would help performance staff normalise best practices and reduce reliance on subjective symptom reporting.

Football performance staff members are pivotal stakeholders in concussion and head injury management, yet their perceptions and understandings are often inconsistent and influenced by competing priorities and cultural norms. Enhancing their education and shifting workplace culture are essential steps to improving concussion outcomes and safeguarding player health and well-being in football.

2.11 Summary

In summary, whilst awareness of concussion and head injury management in performance sport has improved, research continues to highlight substantial gaps in stakeholder knowledge, reporting behaviours and the translation of policy into practice. There is a lack of research examining concussion and head injury care from an integrated practitioner perspective within the context of professional football in Scotland. This current Doctorate responds to these demands by combining both quantitative and qualitative data, including insider practitioner reflection, to develop a more holistic understanding of how concussion and head injuries are experienced, understood and managed.

CHAPTER FOUR.

STUDY I.

KNOWLEDGE AND PERCEPTIONS AROUND CONCUSSION AND HEAD INJURIES.

4.1 Abstract

The purpose of this study was to investigate key stakeholders' (e.g., parents, players, coaches, and performance staff) perception and knowledge of concussion and head injury protocols within Scottish professional football.

Participants (n = 333) completed the online concussion and head injury knowledge survey consisting of three areas: knowledge-based questions, signs and symptoms-based questions and scenario-based questions.

All four sub-groups had a good general knowledge of concussion and head injuries, but more education is required to improve further general knowledge, signs and symptoms, and possible scenarios that parents, players, coaches, and performance staff members may face. Despite many educational interventions existing, there is no programme specific to each of the four sub-groups in the current study. Educational programmes are well received by everyone and have a positive impact on knowledge and understanding of concussion and head injuries. In-person training, such as workshops, may be a more effective delivery method., All programmes should have follow-up refresher courses to reiterate the importance and severity of concussion and head injuries.

4.2 Introduction

Football has experienced an exponential growth in sports science research over the previous two decades (Williams, Ford, & Drust, 2020). Consequently, this has contributed to the evolution of performance over a prolonged period (Barnes et al., 2014). Whilst the field of sports science encompasses a variety of disciplines (e.g., physiology, biomechanics, psychology, nutrition), a significant proportion of the research has focused on athletic development and injury epidemiology (Williams, Ford, & Drust, 2020). The generation and application of this research have undoubtedly made a significant and positive contribution to

the development of professional football; however, many essential aspects of performance remain underexplored (Kirkendall, 2020). One such under-represented area within scientific literature is knowledge of concussion and head injury.

Parents, players, coaches, and performance staff's perceptions and understanding of concussion and head injuries are vital, but research on this topic suggests misunderstandings, despite their basic knowledge in this area (Register-Mihalik, Guskiewicz, & Valovich, 2013). Due to the increased focus on concussion and head injuries, management protocols for young players are limited, and this gives rise to growing concerns from the players' parents and coaches (Bryan, Rowhani, Rahbar, & Comstock, 2016). Despite some evidence suggesting that young players feel pressurised by parents and coaches to quickly return to training even when they may still be displaying symptoms (Rieger et al., 2018), this is empirically untested and will form part of this doctoral project.

A cross-sectional survey study revealed that knowledge of head injuries amongst parents and coaches could be considered marginal at best (Rieger et al., 2018). Coaches cited the misconception that there had to be a loss of consciousness to indicate a head injury. Additionally, and more alarmingly, a quarter of coaches reported they would not remove a player if they suspected a head injury. Almost one in five parents reported they would not seek medical attention for a head injury, and 4% would allow a symptomatic child to RTP (Rieger et al., 2018). The study surveyed 180 parents on their knowledge and beliefs concerning concussion and 86% of the results demonstrated that parents had confidence in their own ability to recognise concussion. Due to some misconceptions around concussion, more education is required. Educational programmes are vital for informing everyone involved in FCs about the correct protocols, symptoms, management, and recovery for concussion.

A cross-sectional study was conducted by surveying parents of youth football athletes from the five most extensive organised youth football programmes across America (Sungwon & Connaugthon, 2021). A questionnaire was developed, and its results demonstrated that 85% agreed that head injuries are serious. Parents were most concerned about any permanent brain damage their child could suffer after a head injury. The study reported a greater appreciation of perceived risks about head injuries amongst parents who had received education and those who had witnessed or heard about a head injury incidence. Based on these findings, parents and coaches must be educated to help reduce potential long-term consequences, and to this end, appropriate information frameworks must be created.

The Rosenbaum Concussion Knowledge and Attitudes Survey (RoCKAS) was devised to address the misconceptions surrounding concussion and head injuries amongst football players and reduce concussion incidences, as well as identify the need for an educational intervention programme. The RoCKAS study involved twenty-six English championship footballers. A mixed-methods approach was adopted, including a survey and an interview. The survey asked concussion knowledge and attitude questions, whilst the interviews asked concussion knowledge, attitudes, and behavioural questions. It identified that some footballers continued to participate in football despite their concussion symptoms and failed to report their symptoms. From their findings, the footballers had a moderate understanding and recognition of concussion when assessed with a pen and paper, but when it came to the interviews, the footballers had a poor level of understanding and behaviours about head injuries and appropriate protocols. The RoCKAS study developed an appropriate educational framework tailored to stakeholders (players, coaches, parents, and performance staff) to improve concussion reporting behaviours among footballers (Williams, Langdon, McMillan & Buckley, 2016).

A study investigated concussion knowledge and awareness among players and parents in Australian youth football. It aimed to determine footballers' age, history of concussion, and years played, and whether parents who had undertaken first aid and concussion training had increased knowledge and understanding of this subject (King et al., 2016). 1441 parents and 2814 players completed a survey containing 23 questions that identified symptoms, management, and return-to-play criteria. Their results showed a significant difference in knowledge of concussion management and return-to-play between players and parents. The players' age, years played, and history of concussion did not increase their knowledge. However, parents who had concussion training had significantly improved scores compared to those with no training. Overall, this study identified that more education workshops are required for players and parents, with a specific focus on return-to-play criteria and common and uncommon head injury signs and symptoms to be aware of.

Therefore, the purpose of this current study was to work with these stakeholder groups (parents, players, coaches, and performance staff) to design, implement and evaluate a concussion and head injury management framework within a professional setting and was guided by the following research question; explore stakeholder perceptions of concussion and head injury management in professional football. The survey was designed to gather both objective and subjective data on stakeholders' knowledge, recognition, and decision-making behaviours related to concussion and head injuries. The question development process drew upon existing validated tools, including the Rosenbaum Concussion Knowledge and Attitudes Survey (RoCKAS) which helped frame the knowledge-based and scenario sections. Modifications were made to tailor the content to the Scottish football context, including terminology reflective of Scottish football culture and specific references to Scottish FA guidance.

4.3 Methods

4.3.1 Participants

Demographic details of the (n = 333) participants who voluntarily completed the online survey for the current study are displayed in Figure 1 below. The non-probability sample included participants drawn from four key stakeholder groups – (e.g., players, parents, coaches, and performance staff members). Participants were invited to complete the online survey through recruitment posters (see appendix 3) advertised on the lead researcher's LinkedIn and Twitter, and through professional and personal contacts and the researcher's supervisors' professional contacts. To meet the inclusion criteria, players were required to be over 15 years of age or to represent the first or reserve (senior) team registered within a professional football academy in Scotland. The coaches and performance staff (e.g., physiotherapists, sports scientists, club doctors) were required to work across any age range (i.e., from foundation 9-11 years to professional development 12-23 years and beyond). The parents were required to have at least one child registered with a professional football academy in Scotland.

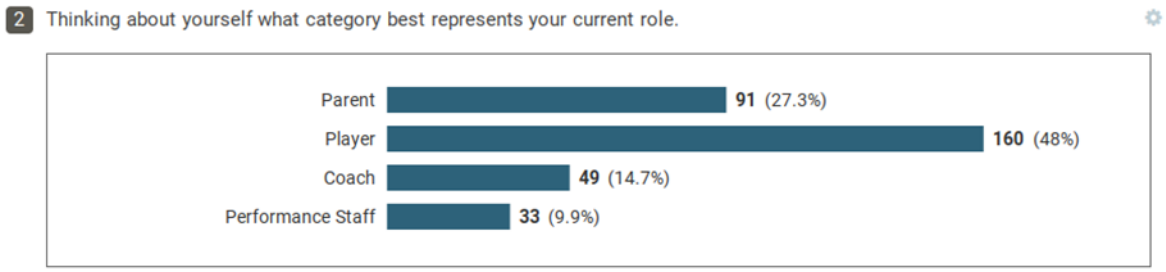


Figure 4.1 presents participants from each sub-group who completed the online survey.

The survey was designed to capture both descriptive and inferential data on stakeholders' knowledge, perceptions, and experiences of concussion in football. Items were developed based on a review of existing literature, relevant policy documents, and informal consultation with professionals working in football. The questionnaire was structured to align directly with

the study's objectives: understanding concussion symptom recognition, knowledge of return-to-play protocols, and perceived confidence in decision-making.

To ensure that responses were collected from targeted populations, the inclusion criteria were included in the promotional poster and the first page of the survey; no information regarding participants' age, name or club was requested, thus they remained confidential. The survey was open for a three-month period from 26th April 2022 until 26th July 2022 and took between 5 and 10 minutes to complete. Participant's consent was provided by checking a consent box on the online survey landing page. Inclusion criteria were assessed based on participants' responses to the second question to identify whether they were a player, parent, coach, or performance staff member. Ethical approval was granted by the LJMU Research Ethics Committee (22/SPS/016), and steps were taken to ensure informed consent, anonymity, and voluntary participation. Participants were provided with a clear explanation of the study purpose, and all data was stored in compliance with GDPR standards. These ethical procedures were essential given the topic's health-related implications and the diverse backgrounds of participants.

4.3.2 Survey Design and Distribution

An online survey was designed specifically for each key stakeholder group and completed by participants across all levels of Scottish football. The concussion and head injury management survey originated from modifications of two previous head injury surveys created by King (2016) and Williams et al. (2016). Modifications ensured the survey questions were appropriate for the target audience in terms of language and were specific to the topic of interest and related to Scottish FCs.

The survey was designed to capture concussion awareness and included: (1) identifying signs and symptomology, (2) head injury knowledge, and (3) strategies for dealing with head

injuries. Questions were categorised as either closed or multiple choice – 'Yes' 'No' 'Don't know' or attitudinal Likert scaled questions (1 = Strongly Agree to 5 = Strongly Disagree), with open-ended questions kept to a minimum. The first section of the survey contained 12 questions designed to elicit information around concussion awareness. Response categories for each question in this section were 'Yes' 'No' and 'Don't know' for each individual question. This section provided insight into the concussion and head injury practices each sub-group was currently deploying within its football environment, allowing for a better understanding of what future recommendations may be required.

Knowledge-Based Questions:	Parent	Player	Coaches	Performance Staff
Have you ever received any information about head injuries or a concussion?				
Has your child/have you/has your player ever sustained a head injury whilst playing football?				
Where did the head injury take place?				
How long ago did you sustain a head injury?				
How long were you out of training/competition for?				
Did you feel like you had fully recovered when you returned to training?				
Does your child's/your FC have a policy on head-related injuries?				
Are you aware of circumstances when a player can RTP immediately after sustaining a head injury?				
Are you aware of current medical guidelines to determine when a player should RTP?				
When do most players sustain a head injury?				
Can related head trauma in young players result in permanent early dementia?				
Head trauma can cause more damage in children than in adults because their brains are still developing.				

Table 4.1 The greyed-out boxes demonstrate the questions available to answer for each subgroup.

The second section of the survey contained 15 questions designed to elicit knowledge of the signs and symptoms of a concussion or head-related injury. Response categories for this section were also ‘Yes’, 'No’, and ‘Don’t know’ for each question. This section demonstrated whether any of the four sub-groups could identify the signs and symptoms of concussion and head injuries. Below is the list of possible signs and symptoms of a concussion or head injury that the four sub-groups were asked to answer as part of this section:

- Unusual sense of smell
- Unusual sense of taste
- Loss of memory
- Blurred vision
- Chest pains
- Dizziness
- Confusion
- Headache
- Nosebleed
- Blackout
- Sharp pains in your neck
- Feeling sick
- Numbness/tingling in your neck
- Trouble sleeping
- Problems concentrating

The third and final section of the survey contained seven scenario-based questions that required respondents to decide whether a player should or should not return to training/play. Response categories for the final section were also ‘Yes’ ‘, No’ ‘, Don’t know’, or ‘Not your decision’

for each question. Below is the list of scenario questions answered by each of the four sub-groups:

- If your child/you/a player reported/report having a headache after a head injury, they would likely have other symptoms?
- Does a concussion only happen when you black out?
- Does a concussion require you to be taken out of the game or training right away?
- If you show any other signs or symptoms of concussion, you should not be allowed to RTP.
- You should be allowed to RTP/training in a slow step-by-step way after having a head injury if symptom-free.
- Your child/you/a player receives a direct blow to the side of their head from another player and falls to the ground. As they get up, they experience mild dizziness and have a headache. Should they continue to play in this situation?
- Your child/you/a player receives a hit to the head during training. They are being treated on the pitch; they are awake, have no memory loss, feel fine, and when asked to jog, only have a mild headache. Should they return to training?

These question types were essential to understand current perceptions of concussion and head injuries from individuals who are actively involved in Scottish FCs. Due to the lack of literature in Scottish football on whether sport science/strength and conditioning training or education is used to minimise and prevent head injuries, the initial study provided a baseline for developing these understandings.

Institutional online software (JISC) was used to design and host the survey. This platform enabled adaptive branching based on the respondent's stakeholder role. Such tailoring was

essential for collecting role-specific responses while maintaining a consistent question base for comparative analysis across sub-groups.

Before the survey launch, the research team conducted a review process. The survey was reviewed for content validity by members of the research team (Stoszkowski & Collins, 2016). A pilot study was conducted amongst institutional sport and exercise staff and members of the post-graduate community. This allowed for feedback on item clarity, structure, and length. This feedback led to the simplification of some medical terminology and the restructuring of specific scenario-based survey questions (i.e., 'Not your decision') to answer options that better reflect the diverse nature of job roles and more realistic match and training conditions. Likert-scale items were included to measure stakeholder attitudes and confidence levels, while multiple-choice (Yes/No/Don't Know) questions were used to assess knowledge. This combination allowed for a richer dataset that captured not only factual understanding but also decision-making tendencies.

4.3.3 Data Analysis

Responses from the JISC online system were exported to Microsoft Excel and IBM SPSS V.27 for analysis. Multiple choice 'Yes' ', No', or 'Don't Know' questions were analysed and presented as a percentage of respondents and frequency count. Attitudinal questions were grouped into Agree (Strongly Agree and Agree) and Neither Agree nor Disagree (Strongly Disagree and Disagree). Data was analysed using descriptive and inferential statistics. Frequencies and percentages were calculated for all demographic, knowledge-based, and scenario-response variables across the four respondent groups. To examine whether response patterns differed significantly between respondent groups, chi-square tests of independence were conducted on categorical variables that were directly comparable across all four groups. Given that the data was derived from categorical response frequencies rather than continuous scores, chi-square tests were considered more appropriate that other methods such as analysis

of variance. A significance level of p . < 0.05 was applied. All data were analysed using IBM SPSS Statistics (Version 29).

4.4 Results

4.4.1 Respondents

333 respondents completed the survey from a variety of Scottish FCs and from all levels. Survey completed numbers from each sub-group were 91 parents (27.3%), 160 players (48%) from a variety of clubs in Scottish football - Premiership (15.6%), Championship (4.4%), League 1 (25%), League 2 (2.5%), Scottish lowland football league (11.3%) and others (41.5%), 49 coaches (14.7%) with over half of the coaches being part-time (61.2%) and 33 performance staff members (9.9%), with just over half of them being employed on a part-time basis. (51.5%).

Players, coaches, and performance staff members who completed the survey were actively involved in a club operating at either the first team or academy/youth level. Respondents were drawn from across the Scottish football landscape, including grassroots, academy, and professional levels. Recruitment was conducted via social media, personal networks, club distribution, and professional contacts, with particular uptake observed among those engaged in youth football.

While the sample was diverse, the lack of input from medical staff (e.g., club doctors) represents a limitation. Moreover, participants who chose to complete the survey may have had pre-existing interest or awareness of the topic, potentially introducing self-selection bias. Nonetheless, the range of responses provided a comprehensive snapshot of stakeholder perspectives at the time of data collection.

Chi-Square Results

A significant association was found between respondent group and whether participants had previously received information relating to head injury or concussion, χ^2 (3, N = 333) = 37.8, $p < 0.01$, Cramer's V = .34. This suggests that access to, or receipt of, head injury information differed across stakeholder groups, with players, coaches, and performance staff more likely than parents to report having received such information.

A significant association was also observed between awareness of whether their club had a head injury policy χ^2 (6, N = 333) = 53.99, $p < 0.01$, Cramer's V = .28. Parents and players were more likely to report that they did not know whether such a policy existed, whereas coaches and performance staff were more likely to report that their club had a policy in place.

In the scenario-based questions, several significant differences emerged. A significant association was found for the question asking whether a player reporting a headache after concussion would likely have other symptoms, $\chi^2(3, N = 333) = 12.68$, $p = .005$, Cramer's V = .20. A significant association was also found for the question asking whether a concussion only occurs when a player blacks out, $\chi^2(3, N = 333) = 8.29$, $p = .040$, Cramer's V = .16. In addition, responses differed significantly for the statement that a player showing signs or symptoms of concussion should not be allowed to return to play, $\chi^2(3, N = 333) = 10.35$, $p = .016$, Cramer's V = .18.

	Parent Total	% Rate
Relationship to child		
Mother	45	49.5%
Father	46	50.5%
Child's education level		
Primary	37	40.7%
Secondary	46	50.5%
College	4	4.4%
Other	4	4.4%
Received head injury info		
Yes	20	22%
No	71	78%
The child sustained head injury		
Yes	19	20.9%
No	72	79.1%
Child's club have head injury policies		
Yes	26	28.6%
No	1	1.1%
Don't know	64	70.3%

Table 4.2 Parent Demographics (n = 91).

	Player Total	% Rate
Career level		
First team	95	59.4%
Reserve team	17	10.6%
Under18's	26	16.3%
Under16's	12	7.5%
Other	10	6.3%
Employment		
Full-time	48	30%
Part-time	112	70%
Gender		
Male	160	100%
Female	0	0%
Received head injury info		
Yes	76	47.5%
No	84	52.5%
Ever sustained head injury		
Yes	79	49.4%
No	81	50.6%
Club have head injury policies		
Yes	51	31.9%
No	10	6.3%
Don't know	99	61.9%

Table 4.3 Player Demographics (n = 160).

	Coach Total	% Rate
Gender		
Male	46	93.9%
Female	3	6.1%
Coaching qualification		
A license	14	28.6%
B license	6	12.2%
Level 2	7	14.3%
Level 1	15	30.6%
Other	7	14.3%
Employment		
Full-time	19	38.8%
Part-time	30	61.2%
Received head injury info		
Yes	34	69.4%
No	15	30.6%
Players coached sustained head injury		
Yes	27	55.1%
No	22	44.9%
Club have head injury policies		
Yes	29	59.2%
No	3	6.1%
Don't know	17	34.7%

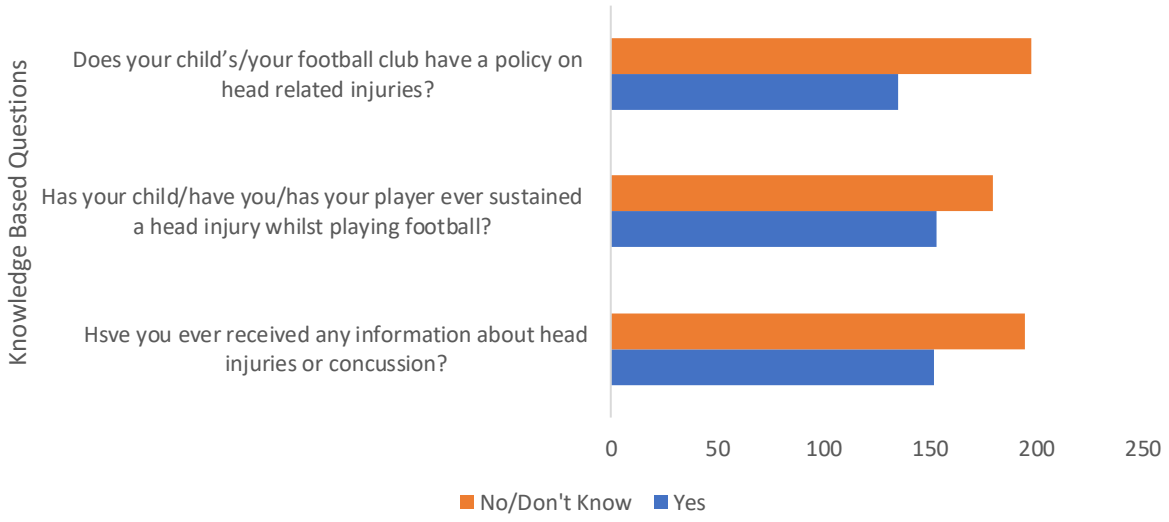
Table 4.4 Coach Demographics (n = 49).

	Performance Staff Total	% Rate
Job title		
Sport scientist	17	51.5%
S&C coach	3	9.1%
Physical performance coach	5	15.2%
Physio	6	18.2%
Sports therapist	1	3%
Medical doctor	1	3%
Gender		
Male	23	69.7%
Female	10	30.3%
Academic qualification		
Doctorate	2	6.1%
Masters	21	63.6%
Undergraduate	8	24.2%
None	1	3%
Other	1	3%
Employment		
Full-time	16	48.5%
Part-time	17	51.5%
Received head injury info		
Yes	22	66.7%
No	11	33.3%
Player sustained head injury		
Yes	28	84.8%
No	5	15.2%
Club have head injury policies		
Yes	29	87.9%
No	0	0%
Don't know	4	12.1%

Table 4.5 Performance Staff Demographics (n = 33).

1.4.2 Knowledge Based Responses

The survey involved parents who currently have a child playing football in Scotland and 71 (78%) of these parents had never received any information about head injuries or concussion, despite nearly a third (20.9%) of their children previously sustaining a head injury. Parents 64 (70.3%) stated they did not know if their child's FC had a policy on head related injuries. Over



half of the players 84 (52.5%) who completed the survey stated that they too had never received any information regarding head injuries or concussion, despite over half of the players 81 (50.6%) who completed the survey stating they had previously sustained a head injury. Players 99 (61.9%) also stated that they were unaware if their club had a policy on football related head injuries. Over half of the coaches 34 (69.4%) who completed the survey had received information regarding head injuries and concussion and over half of their players 27 (55.1%) had sustained a head injury. Over half of the performance staff sub-group 22 (66.7%) had previously received information regarding head injuries and concussion, with 28 (84.8%) of players they currently work with having sustained a head injury.

Figure 4.2 Responses to knowledge-based questions.

As part of the knowledge-based questions, respondents from each of the four sub-groups were asked attitudinal questions relating to their group. Respondents were required to state whether

they strongly agreed, agreed, disagreed, or strongly disagreed with each question. The table below demonstrates the responses from the four sub-groups. There was no neutral “neither agree nor disagree” option, as this would have forced respondents to think and choose an answer. Answers were grouped into Agree (Strongly Agree and Agree) and Disagree (Strongly Disagree and Disagree). The current survey showed low response rates from parents, coaches, and performance staff regarding their ability to recognise a head injury and identify when a player can return to training after sustaining one.

	Respondents Answers			
	Parents	**Players**	**Coaches**	**Performance Staff**
After sustaining an injury, a player should be evaluated by a doctor?	**Disagree** 15 (16.6%) **Agree** 75 (82.4%)	**Disagree** 24 (15.1%) **Agree** 135 (84.9%)	**Disagree** 10 (20.4%) **Agree** 39 (79.6%)	**Disagree** 7 (21.2%) **Agree** 26 (78.8%)
Parents/guardians should know signs and symptoms of a head injury?	**Disagree** 2 (2.2%) **Agree** 89 (97.8%)			
There is not enough attention paid to safety in organised sports such as football?			**Disagree** 25 (51%) **Agree** 24 (49%)	**Disagree** 9 (27.3%) **Agree** 24 (72.7%)
Coaches should have training on head injury management?	**Disagree** 3 (3.3%) **Agree** 88 (96.7%)	**Disagree** 32 (20%) **Agree** 127 (80%)	**Disagree** 6 (12.2%) **Agree** 43 (87.8%)	**Disagree** 1 (3%) **Agree** 32 (97%)
Coaches should know the signs and symptoms of a head injury?		**Disagree** 13 (8.2%) **Agree** 146 (91.8%)	**Disagree** 4 (8.2%) **Agree** 45 (91.8%)	**Disagree** 1 (3%) **Agree** 32 (97%)
I can recognise a head injury?	**Disagree** 22 (24.4%) **Agree** 68 (75.6%)		**Disagree** 19 (38.8%) **Agree** 30 (61.2%)	**Disagree** 10 (30.2%) **Agree** 23 (69.7%)
After a head injury, how can I determine when a player is ready to return?	**Disagree** 51 (56%) **Agree** 40 (44%)		**Disagree** 36 (73.5%) **Agree** 13 (26.5%)	**Disagree** 18 (54.5%) **Agree** 15 (45.5%)

Table 4.6 Responses to knowledge-based questions.

4.4.3 Identifying Signs and Symptoms Responses

All four sub-groups were required to identify whether the 15 options presented to them were possible signs and symptoms of a concussion or head injury. The table below demonstrates how many respondents answered correctly.

Signs & Symptoms	No. of correct responses*			
	Parents (n = 91)	**Players (n = 160)**	**Coaches (n = 49)**	**Performance staff (n = 33)**
Unusual sense of smell	30 (33%)	86 (53.8%)	13 (26.5%)	9 (27.3%)
Unusual sense of taste	27 (29.7%)	89 (55.6%)	13 (26.5%)	8 (24.2%)
Loss of memory	84 (92.3%)	143 (89.4%)	48 (98%)	33 (100%)
Blurred vision	90 (98.9%)	156 (97.5%)	49 (100%)	33 (100%)
Chest pains	53 (58.2%)	103 (64.4%)	31 (63.3%)	14 (42.4%)
Dizziness	91 (100%)	157 (98.1%)	49 (100%)	33 (100%)
Confusion	91 (100%)	155 (96.9%)	49 (100%)	33 (100%)
Headache	90 (98.9%)	158 (98.9%)	49 (100%)	33 (100%)
Nosebleed	6 (6.6%)	43 (26.9%)	7 (14.3%)	4 (12.1%)
Blackout	87 (95.6%)	149 (93.1%)	46 (93.9%)	33 (100%)
Sharp pain in your neck	15 (16.5%)	72 (45%)	27 (55.1%)	28 (84.8%)
Feeling sick	87 (95.6%)	141 (88.1%)	48 (98%)	32 (97%)
Numbness/tingling in your neck	72 (79.1%)	90 (56.3%)	35 (71.4%)	26 (78.8%)
Trouble sleeping	64 (70.3%)	105 (65.6%)	27 (55.1%)	30 (90.9%)
Problems concentrating	80 (87.9%)	135 (84.4%)	44 (89.8%)	33 (100%)

Table 4.7 responses to signs and symptoms questions.

Key areas to note are the four sub-groups (Parents, Players, Coaches and Performance Staff) correctly recognising loss of memory (92.3%, 89.4%, 98%, 100%), blurred vision (98.9%, 97.5% 100%, 100%), dizziness (100%, 98.1%, 100%, 100%), confusion (100%, 96.9%, 100%, 100%), headaches (98.9%, 98.9%, 100%, 100%), backouts (95.6%, 93.1%, 93.9%, 100%) and problems concentrating (87.9%, 84.4%, 89.8%, 100%) as possible concussion and head injury signs and symptoms. Areas such as sharp pain in your neck (16.5%, 45%, 55.1%, 84.8%),

numbness/tingling in your neck (79.1%, 56.3%, 71.4%, 78.8%) and trouble sleeping (70.3%, 65.6%, 55.1%, 90.9%) are often not associated with concussion or head injuries. They were identified correctly by some respondents, but didn't score as highly as the more commonly publicised symptoms. While coaches scored highly on symptom recognition questions, players and parents demonstrated significantly more variability in their responses. This suggests an uneven distribution of knowledge that aligns with informal learning experiences and access to formal training.

4.4.4 Scenario Responses

Responses to scenario questions and concussion and head injury management are presented below in the table of frequencies, with responses captured as 'Yes' ', No', 'Don't know' and 'Not your decision'. Across the four sub-groups, the first area of concern was the response rate to the question: a player who reports having a headache after a concussion will likely show other symptoms. Most respondents selected the answer 'Don't know'. The second area of concern was whether a player should continue playing after receiving a head hit during training and subsequently developing a headache. Respondents demonstrated low responses to the correct answer, with 48.8% of players thinking it would be okay to continue training.

Additionally, a notable proportion of respondents believed the final decision about returning to play should rest with the player, despite medical consensus placing this responsibility with qualified professionals. These results reveal not only a gap in education but also the cultural positioning of autonomy in football, where toughness and personal choice are often valued over clinical caution.

Question	No. of correct responses			
	Parents (n = 91)	**Players (n = 160)**	**Coaches (n = 49)**	**Performance Staff (n = 33)**
If you report having a headache after a concussion, you will likely have other symptoms.	37 (40.7%)	95 (59.4%)	19 (38.8%)	13 (39.4%)
Does a concussion only occur when you blackout?	86 (94.5%)	137 (85.6%)	46 (93.9%)	32 (97%)
Does a concussion require you to be taken out of the game or training right away?	86 (94.5%)	146 (91.3%)	49 (100%)	32 (97%)
If you show signs or symptoms of a concussion, you should not be allowed to RTP.	73 (80.2%)	128 (80%)	47 (95.9%)	31 (93.9%)
Should you be allowed to RTP slowly, step by step, after a concussion if you're symptom-free?	74 (81.3%)	129 (80.6%)	41 (83.7%)	32 (97%)
A player receives a direct blow to the side of their head from another player and falls to the ground. As they get up, they experience mild dizziness and have a headache. Should they continue to play in this situation?	86 (94.5%)	135 (84.4%)	43 (87.8%)	30 (90.9%)
A player receives a hit to their head during training. They are treated on the pitch, are awake, have no loss of memory, feel fine, and when asked to jog, only have a mild headache. Should they return to training?	66 (72.5%)	78 (48.8%)	33 (67.3%)	23 (69.7%)

Table 4.8 Responses to scenario questions.

4.5 Discussion

This study aimed to use an online survey to examine levels of understanding and knowledge surrounding concussion and head injuries across all levels of Scottish football. The survey targeted four sub-groups – parents, players, coaches, and performance staff members.

The findings of this study highlight a persistent knowledge-practice gap amongst stakeholders in football. While many could identify key symptoms of concussion, there was a clear

breakdown when knowledge had to be applied in practical scenarios. This echoes previous research that shows education alone is insufficient unless it is paired with scenario-based, applied training (Caron et al., 2018). The data also revealed an interesting cultural dynamic – the tendency to frame concussion management as a matter of personal toughness or team loyalty. Such narratives were particularly strong among younger male players and amateur-level coaches, suggesting that cultural values may undermine even the best-designed education campaigns.

These findings link closely to the later themes identified in Chapter 7, particularly around cultural pressure and role ambiguity. Participants were often unsure who should lead concussion decisions and deferred to authority figures, even when they held more up-to-date knowledge themselves. This hierarchy complicates the implementation of protocols and highlights the need for clearly defined roles within team settings. The results support the argument that improving concussion outcomes requires not just more knowledge, but systemic and cultural change too.

4.5.1 Head Injury Recognition

The majority of parents, players and coaches sampled in this study had not received any information regarding concussion or head injuries, despite over half of the players who responded to the survey claiming to have sustained a previous head injury. The majority of parents, players or coaches did not know whether their club had any policies regarding head injuries. Over half of the coaches and performance staff stated they could recognise a head injury, but less than half of them could determine when a player would be able to return to training.

The delivery of any educational workshops/interventions may vary depending on the sub-group to which it is delivered (Feiss et al., 2020). They suggest that online education would be

sufficient for parents, while in-person training and follow-up training would be required for players, coaches/performance staff members. This is suggested to improve athletes' health benefits, potentially reducing concussion and head injury risks and potentially reducing any long-term implications (Kerr et al., 2016). A different study suggested that the best outcomes are achieved through in-person training rather than videos/quizzes (Graham et al., 2014). Their in-person training programmes were the same across all subgroups they targeted, and they stated that their programme would improve concussion knowledge and promote behavioural changes. The current online survey also used the same programme to gain an understanding of the knowledge and perceptions of the four sub-groups. The feedback from the current study will be used to enhance further parents, players, coaches, and performance staff members knowledge surrounding concussion and head injuries as well as promoting behavioural change amongst the groups.

A previous study examined coach and parent concussion education programmes (Feiss et al., 2020). Their study aimed to identify changes in knowledge and impact on concussion incidences. Results presented coaches to be more confident in their ability to recognise concussion and head injury symptoms in an athlete and be more confident with aiding the RTP process after they received education programmes. They also presented that coaches felt they could have conversations with their athletes regarding concussion and head injuries and would encourage the athletes to report any symptoms.

Concussion and head injury management programmes have been effective for parents, as previous studies have stated that it improved their overall perceptions, awareness, and general knowledge of this subject (Macdonald, & Hauber, 2016). Their study used an online concussion training programme and suggested this to have the greatest impact on producing the greatest changes in perception, awareness, and knowledge of concussion and head injury incidences.

4.5.2 Signs and Symptoms Recognition

Gaps have been identified within previous research regarding knowledge of signs and symptoms (White et al., 2013). Similar to previous studies, the main finding in the current survey from the signs and symptoms section, suggests a lack of knowledge surrounding signs and symptoms of a concussion and head injury. Sharp pain in your neck, numbness/tingling in your neck and trouble sleeping were answered correctly by some participants but did not score highly.

Concussion and head injuries are mild traumatic brain injuries, with symptoms including, but not limited to, headaches, sensitivity to light, nausea/vomiting, poor concentration, and light headedness (Conway et al., 2019). Symptoms also include mood disorders, sleep disturbances, and cognitive deficits. A concussion or head injury can be difficult to diagnose due to the symptoms not always being visible, varying between individuals, and symptoms can also have different recovery time frames (Makdissi, Davis, & McCrory, 2015). A previous study also identified knowledge surrounding mood and sleep related symptoms to be limited (Rice & Curtis, 2019). Educational programmes must focus on signs and symptoms to ensure that parents, players, coaches, and performance staff are knowledgeable to allow them to effectively manage a concussion or head injury.

Previous literature also demonstrates that respondents to concussion sign and symptoms surveys identify the most common symptoms correctly (Williams et al., 2016), but similar to the findings in the current study, respondents are unaware of lesser-known symptoms such as trouble sleeping. These results suggest that there are consistent misconceptions and further research should focus on the lesser known signs and symptoms This, in turn, may help to promote change in an individual's behaviour and mindset (Kroshus et al., 2014).

4.5.3 Scenario Recognition

Concerning areas that arose from this section of the online survey were that for most of these responses, the respondents did not know the correct answer to the question and responded, 'Don't know'. This identifies that knowledge is limited within this area as the respondents were unable to make a clear 'Yes' or 'No' answer. The severity of a concussion and head injury is often downplayed due to the substitution rule and the importance of the match. For example, in a previous study they quoted a response from a player stating, "If I got a concussion, I wouldn't take it as seriously as a groin strain or hamstring". The current study offered an option at the end where respondents could leave their own comments. One comment stated, "Have experienced head injury/suspected concussion but not told medical team as wanted to continue playing". This emphasises the importance of educational workshops as a player's short-term decision could potentially lead to long-term health implications.

Concussion and head injuries should be managed post games or training and include RTP guidelines that players, coaches and performance staff members must adhere to as well as players being medically cleared before returning in a step-by-step manner, with emphasis on remaining symptom free (White et al., 2013).

Successful treatment of a concussion or head injury relies on the players being honest about their symptoms. However, many players do not disclose symptoms. Players commonly hide and downplay the severity of a concussion and tend to fight through, as an indication of strength (Donaldson & Finch, 2013). Non-disclosure of symptoms or under-reporting the severity of an injury can compromise the coaches and performance staff's abilities to protect the players wellbeing. Football can be a short career and players worry that if they are injured, changes will be made to their team or playing time and ultimately jeopardise their professional career. This is extremely worrying as the long-term implications of a head injury could negatively impact the health and wellbeing of a player.

4.6 Limitations

As a first experience of designing and distributing a large-scale survey, this phase of the research was both challenging and interesting. I quickly realised how question wording and format could shape participants' responses, and I learned the importance of iterative design and testing. Like all research, this study has several limitations that must be acknowledged. Firstly, the use of a self-administered online survey may have introduced self-reporting bias, with some participants potentially answering in a socially desirable manner. The reliance on participants' self-assessment of knowledge and confidence further complicates interpretation, as prior studies have shown that high self-perception does not necessarily correlate with accurate understanding or behaviour (Register-Mihalik et al., 2013).

The sampling approach, while practical, may also have skewed the results. Participants who engaged with the study may have had an existing interest or awareness of concussion, thus creating a more informed sample than the broader stakeholder population. This would mean that actual knowledge levels in the wider football environment may be even lower than those reported. The results suggest a greater educational programme is required across the four sub-groups as knowledge is limited regarding the signs and symptoms of a concussion and head injury. Education would also benefit a player who had just sustained a head injury or was returning to play after one, as it would aid the correct recovery process.

From a reflexive standpoint, my dual role as researcher and practitioner may have influenced participant responses, especially among those who knew me professionally. While I attempted to reduce this by maintaining participant anonymity, the potential for bias cannot be eliminated.

Nevertheless, this study represents a valuable contribution to understanding current stakeholder knowledge of concussion in Scottish football. The large and diverse sample, combined with the inclusion of scenario-based decision-making questions, provides an essential foundation

for any subsequent qualitative inquiry and organisational intervention planning. The study and survey results enabled me to identify knowledge gaps and misconceptions that could be further explored in subsequent interviews and through self-reflection.

4.7 Conclusion

In summary, the online survey was completed by 333 parents, players, coaches, and performance staff from various Scottish FCs at all levels. The nature of the study was to identify knowledge and perceptions surrounding concussion and head injuries from these four sub-groups. Overall, all four sub-groups had a good general understanding of concussion and head injuries, but further education would improve this and provide more detailed information about signs, symptoms, and possible scenarios that parents, players, coaches, and performance staff members could face. Despite many existing educational interventions, there is no programme specifically tailored to each of the four sub-groups. The overall finding from previous research is that educational programmes are well received and have a positive impact on knowledge and understanding of concussion and head injuries. However, in-person training, such as workshops, may be the most effective delivery method. To conclude, all education programmes should include refresher courses to reiterate the importance and severity of concussion and head injury management, and to be used as an opportunity to share new and current guidelines.

4.8 Personal Reflection and Professional Skills Development

During this stage of my PD, I was challenged as both an applied and an academic practitioner. Initially, this was a topic about which I had limited knowledge, and I had to familiarise myself with the subject matter, previous studies, gaps in the literature, and identify the most appropriate way to plan my project. At the outset, I skim-read the methods and results sections of previous studies to identify whether the paper was relevant to my research. I then realised that, as this was a new topic of study for me, there were significant benefits in thoroughly

analysing each paper to build my knowledge and confidence in critically analysing literature. In doing so, I now have a deeper understanding of the subject matter, previous studies and the importance of research methodology, which will enhance both my applied and academic skills.

During the development of the online survey, I decided to conduct a pilot test by rolling it out to current LJMU students and staff members. The purpose of the research was explained, and participants were asked to complete the online survey and provide any relevant feedback. This enabled any issues around wording or formatting to be addressed at the outset, prior to the launch of the project survey. I found this to be a useful method for gaining constructive feedback and finalising the shape of the study.

As concussion and head injuries are such a topical subject, I wanted to present my results in a simple, clear format that was easy to understand, using appropriate language for all parents, players, coaches, and performance staff members. Finally, the current methods adopted in this study were bespoke to all levels of Scottish football.

CHAPTER FIVE.

STUDY II.

Stakeholder Perceptions of Concussion and Head Injury Management in Elite Football.

5.1 Abstract

Concerns around concussion and head injuries have increased within football due to the potential for long-term physical, cognitive, and psychological consequences. Despite the introduction of guidelines and protocols by organisations such as the Scottish Football Association (SFA), recent evidence suggests a gap in knowledge, awareness, and the practical implementation of concussion management strategies across key stakeholder groups. This qualitative study explored the knowledge, perceptions and experiences of concussion and head injury management among four stakeholder sub-groups – coaches, players, parents, and performance staff within a single elite-level Scottish FC. Through a purposive sampling approach, semi-structured interviews were conducted with 17 participants. Thematic analysis guided by an interpretivist framework, was employed to analyse the interview transcripts and identify recurrent themes across the stakeholder groups.

The findings revealed a widespread and concerning lack of knowledge regarding concussion and head injury protocols, return-to-play procedures, and symptom recognition, particularly among coaches, players, and parents. Despite being key figures in a player's support and care, these groups reported limited or no formal training on concussion and head injury management, often relying on common-sense approaches or informal knowledge gained through media exposure. Performance staff demonstrated a more comprehensive understanding of head injury protocols; however, they emphasised the limitations of current training provisions and the absence of clear, standardised post-injury recovery procedures.

A recurring and overarching theme across all stakeholder groups was "lack of knowledge," which was frequently attributed to insufficient education and training initiatives. This deficit was not due to a lack of willingness to engage, but rather the absence of structured and accessible learning opportunities. Participants expressed a strong desire for improved, ongoing education tailored to their specific roles within the football environment. Additionally,

pressures relating to performance outcomes, job security, and the competitive nature of elite sport were found to complicate decision-making processes, often at the expense of player welfare.

This study contributes to the growing body of literature on concussion and head injuries in football by offering a multi-perspective analysis of concussion and head injury management in Scottish professional football. It underscores the pressing need for governing bodies, such as the SFA, to take a more active and systematic role in the dissemination, enforcement, and monitoring of concussion and head injury protocols. The implementation of mandatory, role-specific concussion training and the promotion of a culture that prioritises player health over short-term club performance, are essential steps required to improve concussion and head injury safety in Scottish football. The findings have significant practical implications for policy development, coach education, player safety, and the overall management of concussion and head injuries within elite Scottish football settings.

5.2 Introduction

A concussion or head injury has been recognised as one of the most difficult injuries to detect, suggesting more work is required to recognise, remove, and treat the player (Herring et al., 2021). The risk of concussion in football is substantial with almost a quarter of all injuries being concussions amongst male elite players (Barnes et al., 1998). High-profile footballer cases have heightened industry awareness of concussion in football (Cantu, 2010). Appropriate and timely concussion and head injury management is critical to reduce both the immediate and long-term effects of a concussion or head injury. Most head injuries do not present with loss of consciousness or obvious disorientation; therefore, player self-reporting of symptoms is crucial to deliver appropriate concussion management (McCrea et al., 2010).

Concussion is defined as a traumatic brain injury induced by biomechanical forces, either by a direct blow to the head, face or neck or elsewhere on the body with an impulsive force transmitted to the head (McCrory et al., 2017). Crucially, a player does not need to have a head injury to be concussed (Scullion., & Heron, 2022). In 2016, the rules and regulations were updated to guide those involved with player care to provide them with the latest scientific research on concussion and head injuries and information on the recognition, diagnosis, and management of head injuries (McCrory., et al., 2016). The purpose of this update was to enable practitioners to build on current protocols/practices. Due to the limited research surrounding concussions and head injuries, there is still scope to deviate from official guidelines and for individual management and return-to-play decisions to be made.

Potential long-term effects of a concussion and head injury can lead to a decrease in physical, cognitive, emotional, and sleep quality (DeMartini., et al., 2020). If left untreated or improperly managed, a concussion or head injury can increase the risk of additional negative health consequences (Jingzhen et al., 2017). In football, concussion and head injuries have become very topical over the last few years and have grown in media coverage. However, it is apparent that there is a lack of knowledge and awareness of this subject matter amongst parents, coaches, players, and performance staff.

“If in Doubt, Sit Them Out” was based on a 2012 concussion protocol where it was recommended that an immediate assessment should be carried out (McCrory et al., 2013). Diagnosis is a medical decision based on clinical judgement. “If in Doubt, Sit Them Out” emphasised that any footballer suspected of having a concussion or head injury should be removed immediately from training or the game. A Sport Concussion Assessment Tool, the SCAT5, and a Concussion Recognition Tool, the CRT5, offer guidance for medical and non-medical personnel respectively (Davis et al., 2018). The difficulty is that this concussion

awareness initiative operates on the principle that any concerns result in immediate removal of the player.

The current research adopted an instrumental case study approach, selected one Scottish professional FC to understand concussion and head injury management in a deeper level. Case studies are particularly well-suited to examining complex, context-dependent issues, such as how health decisions are negotiated within performance-driven environments (Yin, 2014). This method allowed for an in-depth exploration of organisational norms, interpersonal dynamics, and implicit cultural practices that influence how head injuries are identified and responded to.

The club selected was the practitioner's place of work who competed in Scotland's Championship level, with a hybrid full-time/part-time staff structure and an academy system feeding into the first team. This context offered a unique blend of elite aspirational young footballers and professional footballers. At the time of data collection, the club was undergoing organisational instability, including budget reductions, changes in staffing, and a push for promotion which all added layers of pressure on player availability and injury management decisions.

These contextual factors were not incidental but central to understanding the pressures that shape concussion and head injury management in real-world sport settings. As such, the case study was both contextually rich and analytically strategic, providing ground for an insight into how policy, practice, and culture intersect in day-to-day operational decisions.

5.2.1 Rules and Regulations

In Scotland, the SFA created guidelines for clubs to follow to help them manage concussion and head injuries (SFA, 2018). Their guidelines have led to advances in concussion and head injury awareness, but there is still a long way to go in relation to protocols being adhered to by all stakeholders within FCs (Yeo., et al., 2020; Shen, 2018; Zynda., et al., 2020). It is suggested

that future research should be specific to the educational workshops and interventions required to enhance the awareness of everyone involved within football, not just the medical teams (Register-Mihalik., et al., 2020). This was supported by the results obtained in the previous chapter of the thesis.

Figure 5.1 Current SFA guidelines for symptoms, recognition, and management.

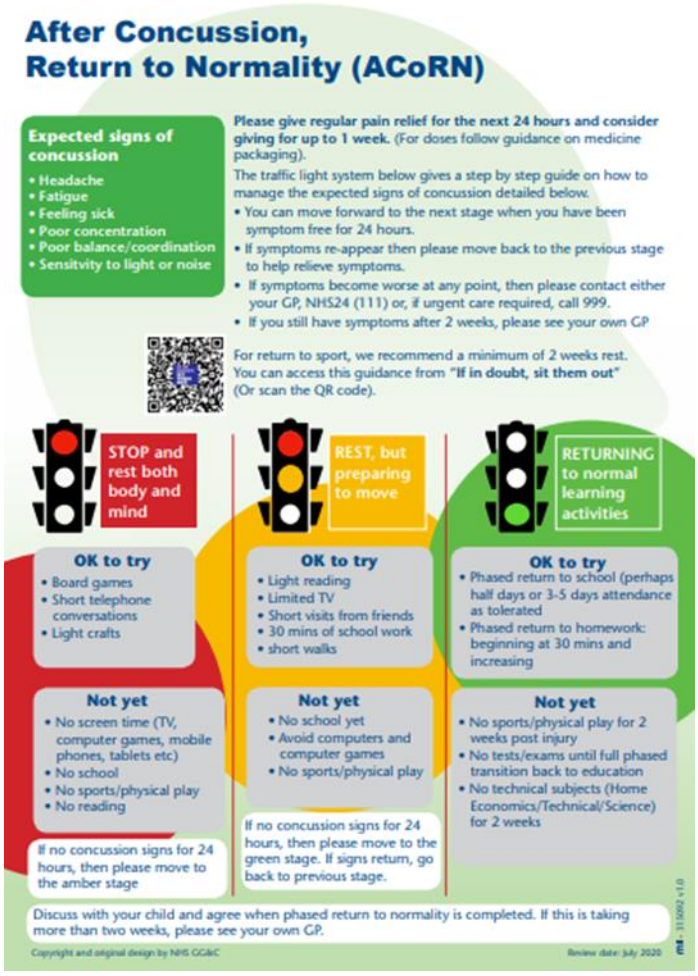


Figure 5.2 Current SFA RTP protocols.

The above two figures are the current SFA guidelines for head injury policies. These guidelines are available to view on the SFA website. However, based on the results from the previous study (Chapter 4), feedback from various sub-groups (parents, players, coaches, and performance staff) at different Scottish clubs and at different levels, suggest these policies to be considered as information only, as their importance is not reiterated/promoted to clubs. Based on the author's experience, these policies are not filtered down throughout the football levels/leagues.

When these new guidelines were released in 2018, the SFA tweeted out a link to them. However, the tweet only received 29 "likes," 22 retweets, and two comments, suggesting a lack of public engagement or perhaps a lack of interest (ScottishFA, 2018). Perhaps more concerning, Scottish Women's football, which promotes and manages most women's football tournaments in Scotland, does not make any reference to the guidelines on their website nor in their documentation or downloads (Scottish Women's Football, 2020). The Football Association (FA) and the Professional Footballers' Association (PFA) conducted a study in 2019 to investigate the incidence of degenerative neurocognitive disease in ex-professional football players (TheFA, 2019). Following the publication of their study, the FA established a research project to guide the governing body on changes to heading guidelines, concussion management protocols, and related research initiatives (The Football Association, 2020). The updated heading guidance, introduced in February 2020, provides grassroots clubs, coaches, and players with recommendations to reduce repetitive heading in youths during training sessions (The Football Association, 2020).

Building on the survey results captured in the previous study, the aim of the current study was to conduct face-to-face interviews to gain a further insight and clearer understanding of the

knowledge and understandings within the sub-groups (coaches, players, parents, and performance staff). The study aimed to explore any knowledge gaps in more detail and to capture any reoccurring and prominent areas of weakness surrounding concussion and head injury identification and management. This study will also be guided by the following research question; explore stakeholder perceptions of head injury management in professional football.

5.3 Methods

5.3.1 Participants

Semi-structured interviews were selected to allow flexibility while maintaining consistency across participants. This format enabled the exploration of core topics such as concussion knowledge, confidence in managing incidents, and organisational dynamics while also allowing for the emergence of unexpected insights. This approach aligned with the study's exploratory and interpretive goals, especially in an area with limited existing qualitative research.

A total of 17 participants took part in the study, representing a cross-section of roles within the club: players (n = 4), coaches (n = 5), parents (n = 5), and performance/support staff (n = 3). All interviews were voluntary, with participants recruited through purposive sampling, based on their involvement with youth or senior players. While the sample was predominantly male, reflecting the gendered make-up of the club environment, efforts were made to include voices across all levels of experience and authority. Each participant brought a unique perspective, and together, they represented a microcosm of the multidisciplinary nature of concussion management in football.

The interviews were shaped by my dual role as a practitioner-researcher embedded within the club, which granted access but also necessitated a heightened awareness of positionality. For

example, players may have moderated their responses due to my perceived authority, while staff may have spoken more candidly based on professional trust. These dynamics were addressed through assurances of confidentiality, informed consent, and careful reflexivity during both data collection and interpretation. Participants were encouraged to reflect not only on procedures but on the "why" behind their actions, helping to illuminate the unspoken cultural norms that shaped their behaviour.

For this qualitative study, a purposive sampling procedure was employed, focusing on key stakeholders exclusively from a single SFA club, consisting of the following:

Participants	Total	Breakdown of Participants within each Sub-group
Players	4	1st team players = 2 U18 players = 2
Coaches	5	1st team manager = 1 Academy coaches = 3 Head of youth development = 1
Performance Staff	3	Physiotherapists = 2 Head of sports science = 1
Parents	5	Academy player's parents = 5

Table 5.1 Breakdown of participants within each sub-group.

The decision to include an official was a consequence of a rule change that emerged following the planning of this study and explains the low participation rate. Following a two-week cooling off period to allow time for study familiarisation, all participants were reminded of the study purpose and that their participation was voluntary. Participants were provided with an information sheet and any concerns were addressed prior to the interviews. The study was

granted ethical approval by the Research Ethics Committee of Liverpool John Moores University (23/SPS/035). All participants provided their written informed consent.

5.3.2 Interview Design

The interview guide was created using an iterative process where the outcomes of the first study (e.g., survey data from Chapter 3) as well as SFA guidance on head injury protocols, informed the subsequent phase of data collection. During the development of the interview questions, regular meetings were held with the supervisory team to allow for appropriate adaptations to be made to the interview guides. These included the framing of the questions to ensure they related to the research question and to maximise the responses from the participants (i.e., avoiding leading and closed questions). Exemplar questions relating to Study 1 were included in the interview guide to provide the participants with context around why each question was being asked.

Pilot testing was carried out on a small convenience sample of participants matching the inclusion criteria from the Scotland Cerebral Palsy National Football Team who were not involved in this doctoral project (n = 3; physiotherapist, coach, and player). The pilot testing was conducted during an international training camp in March 2023 and allowed the interviewer the opportunity to amend the order of the questions and to adapt any questions as required. The amendments to the wording in the questions were to avoid repetition and minimise participant burden. As the lead researcher is considered a neophyte qualitative researcher, the pilot study enabled the investigator to refine their interviewing skills and active listening techniques. Following the pilot study, additional debriefs were held with the supervisory team to discuss the process and receive guidance around probing and asking follow-up questions. For example, "that's a really interesting point, can you expand on what you mean here?"

5.3.3 Researcher Positionality and Procedure

This phase of the study was positioned within an interpretivist paradigm, where the focus was on understanding the experiences of individuals, which are, naturally, subjective (Coe, 2012). Here, social reality was regarded as a product of how people, both individually and collectively, make sense of their social world (Markula & Silk, 2011). Thus, the interpretive qualitative methods, as reported in this study, are packed with several 'layers of truth', offering a representation of 'reality' by revealing an interconnected, multi-dimensional narrative experienced by the individuals in question (Salla, 1993).

At the time of data collection, the lead researcher (ER) was a member of the academy sports science department within an SFA club. Therefore, given the relationship which can exist between researcher and key stakeholders (Rowe, 2014), it is important to further understand the positionality of the researcher and how this could potentially influence the results. The lead researcher has approximately 9 years' experience working as a sport and exercise scientist and strength and conditioning coach at various FCs at both senior and academy levels across the Scottish football pyramid. These roles consist of daily training, data feedback and conversations with coaching staff. In the context of the current study, the lead researcher is a member of the performance staff supporting the club's academy and first team players and, to a lesser extent, the parents of the academy players in this study. Importantly however, the researcher is not in a management or head coaching role and so does not hold any legitimate power (i.e., team selection, academy player deselection etc.). From a research perspective, this is important, as it is well established that professional football environments can be a competitive, 'cut-throat', and 'uncaring' working environment (Cronin et al., 2020). Elite football has previously been described as an environment controlled by traditional values, built around authoritarianism, hierarchical defence, and masculinity, where power is viewed as a thing to be "grasped" and where "alliances are formed and the processes of legitimation are

secured" (Westwood, 2002: Potrac & Jones, 2011). For instance, previous studies in professional football have offered qualitative narratives of individuals experiencing difficult working relationships with colleagues (Potrac et al., 2012; Thompson et al., 2015). This rapport is seen to facilitate openness and honesty in the participants answers during the interviews.

Prior to the interviews commencing, qualitative research training was provided by a senior member of the research team (SR) who has previous experience and expertise of undertaking qualitative research in professional football environments (Reeves et al., 2013). Coupled with the lead researcher's experiences of working as a sports scientist in a professional FC, this training confirmed the importance of avoiding overtly scientific terms and technical jargon (Daly et al., 2021) and using active listening techniques (e.g., regular eye contact and/or nodding) to help establish and maintain rapport with the participants (Patton, 2014). Before the interviews, participants were reminded of the purpose and logistics of the interviews and being assured of anonymity throughout.

This qualitative study included a series of in-depth, face-to-face interviews conducted at a single SFA club. All interviews were completed during typical 1st team and academy working hours, at a time determined convenient by the participants. This proved to be logistically challenging and a protracted process due to the in-season training regimes/game schedule and the timing of training sessions for academy players. All the interviews were conducted in a private office located at the training ground to ensure there were no distractions or interruptions. All interviews were digitally recorded using an audio recording device (Apple iPhone 11 Voice Memo app).

Prior to the interviews, the interviewer asked the participants some initial icebreaker questions. This was to ensure the participants felt relaxed and comfortable. The participants were reminded that the answers provided were confidential, and the information provided would not

be shared with any members of the club management structure. This was to ensure participants were open and honest with their responses and to ensure trustworthiness of their data. During the interview, the lead researcher (interviewer) guided the participants through a series of interview questions (Appendix 4). The interviewer also had a list of follow-up questions should the interviewer require additional information from the participants. Sample questions included "That's an interesting point. What makes you think that?". The interviews lasted between 16 and 24 minutes, with a mean duration of 20.3 minutes (SD = 2.4).

5.3.4 Data Analysis

All audio recordings were transcribed verbatim, producing 15,345 words across 53 pages of single-spaced text. Transcripts highlighted the actual words spoken by participants and the interviewer in a linear, written form, which could not capture the fluid dynamics of words and gestures (Riessman, 2008). Inductive thematic analysis (TA) developed themes through a six-stage analytic process (Braun, Clarke & Hayfield, 2019). This analysis developed over time via a recursive, organic, ongoing process between the larger data set, the coded extracts, and the data being produced. Familiarisation and coding of the data started with repeatedly and actively reading the data; writing notes on transcripts; using highlighters to identify data extracts; and then using post-it notes to identify segments of data. Codes identified features of the data that appeared interesting in the most basic sense. These codes formed the basis of repeated patterns across the data set that could be grouped in a meaningful way. Similar codes were colour coded to group similar groups and locate as many potential patterns (“themes”) as possible, creating a ‘thematic map’. Here, codes were combined, refined, separated, or discarded: some themes were not themes at all; some merged into others; some were too diverse and required breaking into separate themes. This collection of main themes, sub-themes, and extracts of data provided an insight to the significance of individual themes (Braun & Clarke, 2006). Once main themes captured the landscape of the coded data, individual themes were

considered in relation to the entire data set. Here, ‘accurate representation’ aligned with the constructionist perspective, behaviour, and practices. The thematic map produced an understanding of how different themes fitted together and highlighted the overall story they told about the data. Themes were then refined and refined further to be presented in the analysis, developing themes that were not too broad, diverse, or complex (Braun & Clarke, 2006). Themes were organised into a coherent and internally consistent account, considering the ‘story’ that each theme told and how it fitted into the broader overall ‘story’ of the data in relation to the research question. This limited any overlap between themes (Braun & Clarke, 2006) and concluded with clearly defined themes. During the write up of the study’s findings, theme titles were further refined.

5.3.5 Trustworthiness and Rigor

Regular meetings with the research team offered reflexive support (i.e., via MS Teams during the writing phase) to help navigate biases around my own beliefs and understanding of concussion and head injury management and working in a performance context (Orr et al., 2021). A reflexive thematic analysis process was followed by taking notes and documenting thoughts on how a concussion and head injury is viewed from a stakeholder perspective was central to this process. Member checking was avoided because its ontological assumption clashed with the ontological relativism of the study (Motulsky, 2021). The findings reported in this study contribute theoretically and practically to a performance-based football setting; by providing insight(s) and understanding of concussion and head injury management and embody a credible, 'real' sense of the participants lived experiences (Smith & McGannon, 2018). The themes that follow represent the perceptions and beliefs of coaches, players, performance staff, and parents. The reader is asked to consider these themes in terms of their relationship to them and perhaps their own experiences as they navigate their way through them (Sparkes, 2020).

5.4 Results and Discussion

The aim of this study was to conduct semi-structured interviews to gain further information and a clearer understanding of the knowledge and understandings towards concussion and head injuries within a single SFA club. This study was guided by the following research question; explore stakeholder perceptions of concussion and head injury management in professional football.

Seventeen semi-structured interviews were conducted with participants from five sub-groups (four players, five coaches, three performance staff, and five parents). Interviews aimed to last 20 minutes, but times varied in length depending on how much information the participant was disclosed. The interview data is presented alongside the thematic analysis to provide clear comparisons between sub-groups. This results section will represent the common overarching themes analysed from each of the general sub-groups. Pen profiles were used to illustrate the themes and sub-themes within the general sub-groups. The figures within the results are not presented in any hierarchical order. Instead, they are presented in the order of the 5 sub-groups previously noted, to provide the reader with context for the environment in which the feedback was delivered. Each interview was analysed and interpreted independently. Below in Figure 5.3 are the three overall common themes within the five sub-groups. However, for the purpose of this chapter, the overall findings will be broken down to the five sub-groups. This again allows for further analysis of each sub-group.

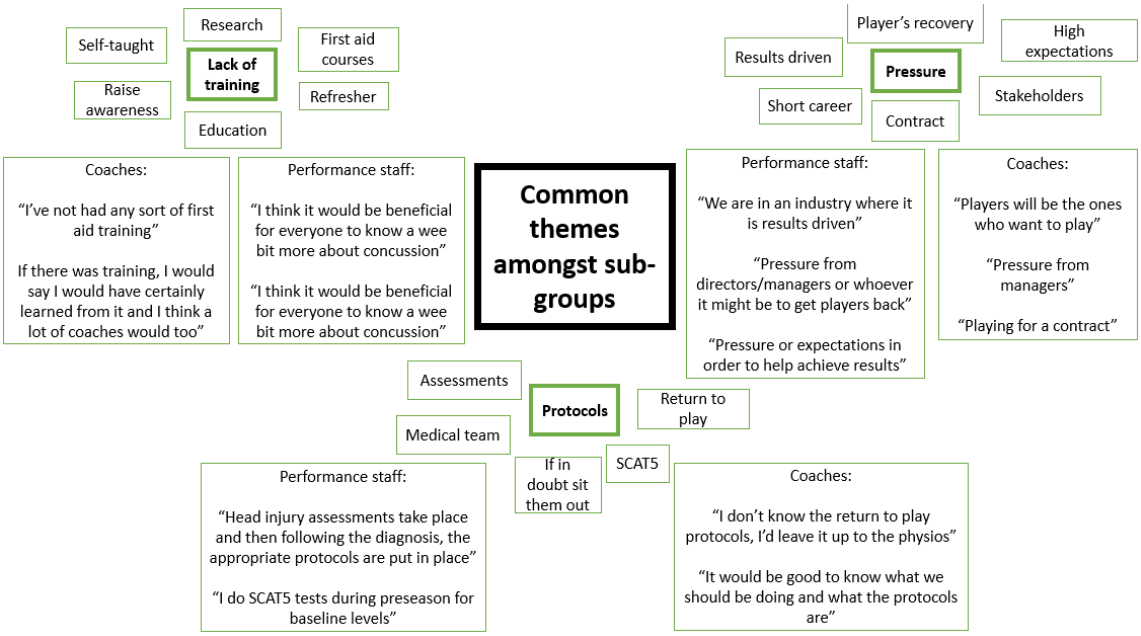


Figure 5.3. Pen profile for common themes amongst sub-groups.

5.4.1 Players

Nowadays, players tend to be more aware of concussion and head injuries and the possible long-term complications. The players in this study had not received any form of training; their awareness had simply been gained from increased media coverage over the last few years. The three key reoccurring points identified from interviewing the four players were – return to training, honesty, and lack of knowledge. Figure 5.4. below presents the player's pen profile.

Figure 5.4. Player's pen profile.

Theme 1: Return to training

There is pressure on players to return to training and competition for their team position when they are out injured. Interviews with players who had sustained head injuries, as well as those with colleagues who had a head injury, suggest that players often feel rushed back into play before fully recovering. One player commented:

"I have never had a head injury, but I know people who have and been out for 3-4 weeks and it still wasn't fully recovered when they returned". (Player 1)

This emphasises the urgency placed on players returning to their team. This finding aligns with previous research, which has consistently highlighted the tension between player welfare and the pressures of professional sport (Roderick, 2006; Waddington & Roderick, 2002).

However, the findings from the coaches' interviews present a contrasting narrative. Coaches stated that, in the current climate of heightened awareness surrounding concussion and head injuries, there is more caution and less pressure for players to return prematurely. This shift in

approach may reflect an increased understanding of the risks associated with head injuries, especially given the growing media attention surrounding concussion in sports. The increased media scrutiny could play a significant role in influencing a positive change in coaching behaviour, as well as the institutional policies that govern player health and safety (Miele et al., 2020). It is possible that coaches' statements reflect an idealised version of current practices, whereas players' experiences may be more accurate in reflecting the day-to-day realities of the pressure to perform, particularly in high-performance environment.

The discrepancy between the players' and coaches' reports also reflects a broader issue in sports culture, where players may fear the consequences of not returning to play in a timely manner. Previous research has suggested that players often experience anxiety and uncertainty about losing their position in the team, as well as the long-term negative impact on their career. As one player noted:

"*If you're out for too long, someone can take your spot in the team and it makes you worry about your place and your future*". (Player 3)

This fear of losing their place in the team is consistent with past research (Roderick, 2006), which suggests that players' perceptions of injury-related risks are often shaped by the cultural expectations and competitive nature of professional sports. The fear of being side-lined and potentially missing future opportunities, both in terms of match appearances and career progression, can lead players to downplay their injuries or rush their recovery (Elliott et al., 2016).

There is limited research on the role of the coach's behaviours towards injured players as previous research mainly focuses on players' experiences and the medical management of injuries. There is little attention given to how managers and coaches influence players' perceptions of injury and recovery (Mallett & Hanrahan, 2004). It is possible that the drive for

team success and the inherent pressures of professional sports create a culture where players feel compelled to return to action before they have fully recovered, even if coaches claim to prioritise player welfare. Understanding the nuances of this dynamic is crucial for ensuring that both the physical and psychological well-being of athletes are protected.

As the awareness of head injuries in football continues to evolve, it is important that practices surrounding return-to-play decisions are standardised and evidence-based. Additionally, there is a pressing need for research into the specific pressures that players face in relation to injury recovery and the potential long-term effects of early return-to-play decisions, particularly in relation to concussions (McKee et al., 2013).

Theme 2: Honesty

Interviews with players provided a concerning insight into their attitudes and behaviours surrounding injury disclosure in football. One notable finding was that players were more likely to report the full severity of a concussion or head injury only when they perceived the injury as serious:

"If it wasn't serious then no, but if I'm feeling slightly dizzy then I would report it". (Player 4)

This behaviour can be seen as both a product of individual perceptions of risk and a systemic issue relating to the lack of education and awareness about the long-term consequences of head injuries. It also highlights the threshold at which players feel compelled to report injuries. This mindset suggests that players may not fully understand the long-term risks associated with repeated head trauma, or they may prioritise short-term performance over long-term health. This is extremely concerning, but not surprising, as it is due to the lack of training and education available to players and all stakeholders interviewed within this Scottish FC.

The reluctance to report injuries unless deemed "serious" reflects a broader trend in sports culture, particularly in football, where toughness and playing through injuries are often emphasised. Previous research has shown that athletes, particularly in contact sports like football, are frequently influenced by a culture of "playing through pain" and often under-report injuries to avoid being seen as weak or unfit for competition (McCrea et al., 2004; Guskiewicz et al., 2003). In the context of concussions, this could have dangerous consequences, as unreported or inadequately managed head injuries could increase the risk of long-term complications (Stern et al., 2011).

A previous study emphasised the importance of early detection and proper management of concussions to reduce the risk of long-term neurological issues (McKee et al., 2014). Despite this, the lack of education on concussion symptoms and the potential for long-term consequences remains a critical issue within many FCs.

Interestingly, some players in this study did express a shift in their approach to injury disclosure, citing a growing awareness of the long-term risks associated with concussion. As one player noted,

"Yes, so it doesn't affect me later down the line, and so I can continue playing". (Player 2)

This suggests that media coverage and increased public discourse surrounding head injuries have led players to take a more proactive stance toward their health and injury disclosure. This shift aligns with the findings of other studies, which indicate that when athletes are better informed about the risks of concussion, they are more likely to report injuries and take appropriate action (Baugh et al., 2012).

However, while increased awareness may be beneficial, it is clear from the results that significant gaps remain in the education provided to players regarding concussion

management. As highlighted in the interviews, many players do not feel equipped to recognise the full extent of their injuries or are uncertain about the protocols for injury reporting and recovery. This points to the urgent need for comprehensive concussion education and training within Scottish FCs at all levels. Ensuring that players understand the importance of reporting all head injuries, could significantly improve player safety and reduce the long-term impact of concussions.

Theme 3: Lack of knowledge

Lack of knowledge is a consistent theme regarding concussion and head injuries not just with players but across other stakeholders involved in football. All the players interviewed expressed a desire for more information on concussion and head injuries:

"I'd like to know more in case I ever sustain a head injury". (Player 1)

Many players recognise the potential risk but feel ill-prepared to address or manage it effectively. This desire for increased knowledge reflects a proactive attitude towards personal safety, which could be leverage to enhance concussion prevention and management strategies in the future. Previous research indicates that knowledge about concussions among athletes, especially at the amateur or semi-professional levels, remains limited. Studies have shown that while elite players often receive more information through structured medical support and training, many players at lower levels report inadequate education on concussion signs, symptoms, and recovery protocols (Rivara et al., 2014; Kessel et al., 2018). This lack of awareness can contribute to players continuing to play despite experiencing symptoms, thereby increasing the risk of further injury (McCrory et al., 2017).

Interestingly, the players interviewed did not express significant concern about concussion and head injuries themselves, but rather a clear desire for more knowledge on the matter. As one participant remarked:

"Players themselves could probably know more about it". (Player 4)

This emphasises the importance of adopting a more informed environment within the Scottish football community. This desire for additional information aligns with calls from researchers and practitioners advocating for more comprehensive education programs tailored to players (Lovell et al., 2018). Such programmes could address the risks of repeated head impacts, the long-term consequences of concussions, and the importance of proper recovery strategies.

The findings from this study suggest that there is still much work to be done to ensure that players at all levels of football are equipped with the correct information they require to make informed decisions regarding head injuries.

5.4.2 Coaches

Coaches raised a number of important points which they had either learned from training courses or through their applied experiences. However, the four key reoccurring points identified from interviewing the five coaches were – protocols, honesty, pressure, and training. Figure 5.5. below presents the coaches pen profile.

Figure 5.5. Coaches pen profile.

Theme 1: Protocols

The results of these interviews reveal gaps in the knowledge of football coaches regarding concussion and head injury management. While coaches acknowledge the importance of head injuries, they do not believe it is their responsibility to stay informed about concussion protocols, instead deferring this responsibility to the medical staff. This lack of engagement is illustrated by statements such as:

"Physios assess players and make the call on whether they're fit to train or play" and "I don't know the RTP protocols, I'd leave it up to the physios". (Coach 2)

This reliance on medical professionals, while essential, indicates that many coaches do not view themselves as active participants in the management of head injuries, despite their pivotal role in identifying potential injuries and monitoring players' well-being during training and matches. It is important to note that concussion management is not solely the responsibility of the medical team. Coaches play a critical role in identifying signs of concussion, monitoring players during training and games, and communicating concerns to medical professionals. By better equipping coaches with the necessary knowledge and tools, the overall safety and well-being of players can be significantly improved. This aligns with recommendations made by the Concussion in Sport Group (2017), which advocates for multi-disciplinary approaches to concussion management, including education and collaboration between coaches, medical staff, and players.

The study findings are consistent with previous research which suggested that many coaches are unaware of the current concussion protocols or their specific role in the process. A recent study found that coaches often struggle with understanding recovery timelines and how to

appropriately implement return-to-play protocols (Feiss et al. 2020). This gap is particularly alarming because, as the results of this study found coaches failing to recognise concussion symptoms or advocate for proper medical assessment in a timely manner, potentially placing players at risk by allowing them to continue or return to the field too soon.

This issue is further compounded by the staffing limitations common in Scottish FCs, where resources are stretched thin, and departments often share responsibilities. Coaches in smaller clubs may be less likely to receive sufficient concussion management training, as they may not have the opportunity to engage in specialised training sessions or access the latest research on head injury management. It is notable that the coaches interviewed in this study expressed a desire for more comprehensive training, as reflected in statements such as:

"It would be good to know what we should be doing and what the protocols are" and *"I do think more training would be worthwhile to have at the club for coaches and also the players".* (Coach 1)

These comments highlight a clear need for accessible and regular training in concussion management, both for coaches and players, to ensure that a multidisciplinary approach is adopted to better equip the stakeholders to handle head injuries more effectively.

A previous study identified that coaches with more training were better able to identify concussions and were more likely to adhere to return-to-play protocols, reducing the risk of further injury (McLeod et al., 2017). In line with these findings, it is imperative that Scottish governing bodies and Scottish FCs prioritise the development and dissemination of clear concussion management protocols:

"It would be good to know what we should be doing and what the protocols are" (Coach 5) *and another coach had stated: "I do think more training would be worthwhile to have at the club for coaches and also the players".* (Coach 3)

Current protocols should be clearer and more accessible to everyone involved within a FC.

Theme 2: Honesty

Honesty is a big part of the multidisciplinary team within any FC. Communication between coaches, players, and medical staff is key when it comes to the full declaration of a player's injury and this is especially important when reporting a concussion or head injury. Coaches, as key decision-makers in the team environment, emphasise the necessity of players being forthright about their injuries (McCrory et al., 2017). This aligns with the current understanding that concussions, not always being a visible injury, require full disclosure from the player to ensure proper care and treatment are adopted. One coach interviewed stated:

"I'm not a mind reader, you need the player to be honest". (Coach 3)

This demonstrates the reliance on players to self-report symptoms, a critical aspect of concussion management in football. Coaches who were interviewed recognised the duty of care they owe to their players, acknowledging that players' health must take precedence over immediate performance needs. As one coach stated:

"You've got to put the players' health first and foremost at the price of not having your best player available". (Coach 1)

This reflects the broader shift in sport towards prioritising long-term health over short-term competitive gains. Research indicates that coaches are increasingly aware of the risks of returning players too soon after head injuries, particularly concussions, which can lead to serious long-term consequences (Guskiewicz et al., 2005).

Moreover, the findings suggest that modern coaching approaches have evolved, with greater trust and collaboration between coaching staff and medical departments. Coaches now look to sport science and medical professionals for guidance on injury prevention and the management of head injuries. This collaborative approach mirrors the trend in sports science towards multidisciplinary teams that work together to optimise player safety while maintaining performance standards (Bahr et al., 2017). Coaches' openness to this guidance indicates a growing recognition of the complexities surrounding concussion management, which often involves balancing the immediate demands of competition with the long-term health risks associated with repeated head impacts.

In terms of injury prevention, the results underscore the importance of a coaching philosophy that values player welfare. This approach is consistent with recommendations from medical and sports organisations, which advocate for a cautious and well-coordinated approach to concussion management (Koehler et al., 2019). Coaches' evolving attitudes reflect the increased awareness of the neurocognitive risks associated with repeated concussions, as well as a broader cultural shift in football towards player-centered care.

Theme 3: Pressure

From the coaches' interviews there is significant pressure faced by football coaches and managers, which can often influence their decisions regarding a player's welfare, particularly in the context of concussion and head injuries. The coaches who were interviewed acknowledged the risks associated with head injuries but often faced competing pressures that complicated their ability to consistently prioritise player safety. This dynamic reflects a tension between the short-term demands of winning games and the long-term health considerations for players, especially in an environment where job security is reliant upon performance.

One of the most prominent issues highlighted by the coaches was the pressure to return injured players to the field as quickly as possible, particularly when those players are considered vital to team success.

"There's always that pressure on you to get your best players back on the pitch, even when you know they might not be ready". (Coach 4)

This pressure on the coaches was not only external from fans, and club executives but also experienced internally from managers and players who themselves often felt compelled to play through injury to retain their position in the team or fulfil their contractual obligations. This mirrors findings from previous research, which have pointed to the prevailing culture of "playing through injury" in professional football (Williams et al., 2017).

"layers will be the ones who want to play, but I wouldn't take the risk". (Coach 2)

While the coaches who were interviewed expressed concerns about the long-term consequences of head injuries, their responses suggest a pragmatic shift when faced with the realities of competition. This is consistent with the research by Gabbett et al. (2018), which found that coaches' attitudes toward player safety often evolve in response to immediate competitive demands. This captures the moral dilemma faced by coaches: they are aware of the potential long-term health risks of concussion, but the need to field a competitive team often overrides these concerns. In practice, the application of concussion and head injury protocols may be inconsistent, particularly when the team's performance or the coach's job is at stake.

Coaches and managers face extreme pressure to achieve club success in a short period of time whilst trying to plan for the long-term, in a job with very little job security. However, the day-to-day running of a coach or manager role is not fully known or understood due to little research being conducted on this topic (Law & Bloyce, 2019). Coaches and managers rarely have a fully

fit squad of players to select from and it is common to have players play when they're not fully fit (Helsen et al., 2018). Some players are actively encouraged to play despite injury as they are deemed to be of great importance to the team (Bailey & Collins, 2013). It demonstrates that a coach's philosophy and beliefs will change according to the demands for each game. This is not unusual in high performance sports where the pressure comes from winning or losing where success can be at the detriment of a player's welfare. From a practitioner's perspective, having witnessed the pressure players are under to make themselves available for team selection, I believe a player's health is put at risk to have the best team available for games. This practice is deemed to be acceptable but it is not officially recorded. This identifies a lack of duty of care towards players as they are put back into full training and games when they might not have fully recovered.

Theme 4: Training

One of the most prominent findings was the mixed responses regarding the availability and effectiveness of concussion and head injury training. Training helps to raise awareness of the severity of a concussion or head injury as well as educates a variety of stakeholders to understand the importance of the protocols and guidelines that are in place across all Scottish FCs. There was a mixed response amongst the coaches who were interviewed in terms of whether they had received any training or not. One coach stated:

"I've not had any sort of first aid training" (Coach 5) and another stated: *"If there was training, I would say I would have certainly learned from it and I think a lot of coaches would too".* (Coach 4)

This suggests that despite there being rules and procedures in place, if not all stakeholders receive appropriate training then the guidelines will not be fully adopted. These findings align with previous research indicating that the absence of adequate training may lead to

mismanagement of concussions and other head injuries, which could lead to serious long-term consequences for athletes (McCrory et al., 2017). Another coach stated:

"I think it's always good to have a refresher". (Coach 2)

Following any appropriate training courses, refresher courses would be beneficial to revisit the subject as well as providing an opportunity to update everyone regarding any recent changes in guidelines and any new research findings. A recent study suggested that an online educational module improved coaches' concussion and head injury knowledge by 41% with signs and symptoms knowledge increasing by 37.5% and common misperceptions decreasing by 13.7%. Coaches who participated in this study also felt more confident in their abilities to recognise concussion symptoms as well as being more confident in their ability to help with the return-to-play process. Coaches also stated they felt more encouraged about raising the awareness of concussion and head injuries within their teams (Feiss., et al., 2020). This emphasises the need for training all stakeholders involved within a FC.

The mixed responses regarding training also underline a critical point: concussion education is not uniform across Scottish FCs. This disparity may be due to a lack of standardisation in concussion management training programmes. Some coaches, especially those at lower levels or in grassroots football, may not have access to training due to resource constraints. This can lead to inconsistent implementation of concussion protocols, which may inadvertently compromise player safety (Rees et al., 2021). This emphasises the importance of making concussion training accessible to all, regardless of their coaching level or the resources available to their clubs.

Additionally, the findings suggest that coaches' understanding of concussion symptoms and protocols is not always as robust as it could be. Although some coaches expressed a willingness to learn and acknowledged the potential value of training courses, the current gaps in their

knowledge could have serious implications for the health and safety of players. Coaches are the first line of defence in identifying potential concussions, and without proper training, they may fail to recognise early symptoms, which could lead to delayed treatment and the increased risk of long-term brain injuries (Guskiewicz et al., 2007).

5.4.3 Performance Staff

Performance staff members had more knowledge and understanding surrounding concussion and head injuries due to the nature of their jobs. However, they did state that their information/training is very limited. The four key reoccurring points identified from interviewing the three performance staff members were – training, pressure, protocols, and awareness. Figure 5.6. below presents the performance staff's pen profile.

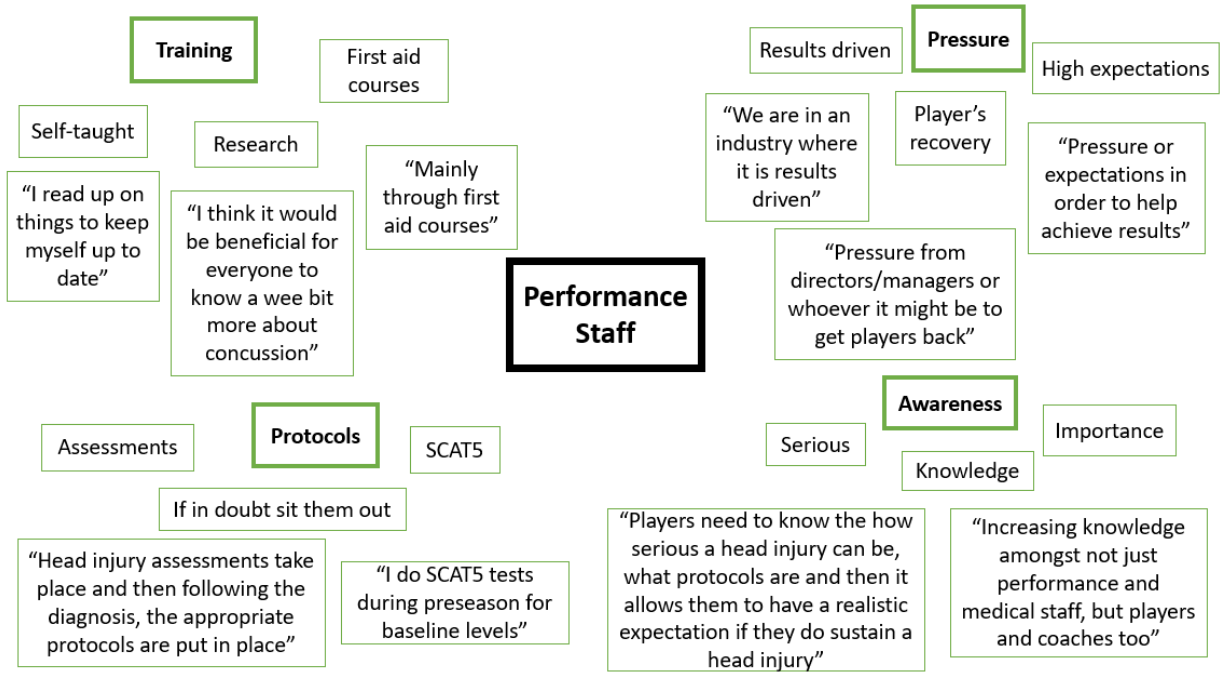


Figure 5.6. Performance staff's pen profile.

Theme 1: Training

When interviewing the performance staff members, the findings indicate that, although performance staff members demonstrate an awareness of the importance of staying up to date

on concussion-related information, there are notable gaps in their knowledge and training. While personal initiative in research is commendable, the reliance on self-directed learning may lead to inconsistencies in understanding the most current and evidence-based concussion protocols and guidelines. One performance staff member stated:

"I read up on things to keep myself up to date" (Performance Staff 1) whilst another stated:

"I think it would be beneficial for everyone to know a wee bit more about concussion".

(Performance Staff 3)

It was reported that much of their knowledge on concussion and head injuries came from their own personal research and general first aid courses, which are typically not tailored to the specific needs of football or other contact sports. One staff member noted, "I read up on things to keep myself up to date," highlighting the reliance on individual effort to stay informed. While this demonstrates initiative, it also raises concerns about the accuracy and depth of the information that staff members may be encountering. The challenge lies in the fact that concussion guidelines and best practices evolve regularly, and unless performance staff are engaging with up-to-date, credible sources, there is a risk of misinformation or outdated practices being followed (McCrory et al., 2017).

Moreover, it was noted that while concussion and head injuries are briefly covered in first aid courses, the training is described as basic and limited in scope. One participant shared this was where they acquired their concussion and head injury training:

"Mainly through first aid courses". (Performance Staff 2)

This indicates that education for performance staff at this club was still required on this topic. However, these courses tend to focus on foundational knowledge and may not provide the specific, in-depth understanding necessary for medical departments within FCs. As football is

a high-impact sport, the need for more comprehensive, specialised training in concussion management is critical. Research indicates that concussion education should be an ongoing, evolving process that goes beyond generic first aid training, emphasising sport-specific scenarios and up-to-date management strategies (Kuehl et al., 2017). Without such targeted training, performance staff may not be equipped to effectively identify, manage, or communicate concussion-related concerns.

The importance of specialised training becomes particularly evident when considering the evolving nature of concussion research. New protocols, such as the 5-step RTP (RTP) protocol and changes in the guidelines for concussion assessment (Guskiewicz et al., 2007), may not be adequately covered in general first aid courses or through personal research. While first aid courses offer a valuable introduction to concussion management, more in-depth understandings, particularly in a sport-specific context, are required. Performance staff play a vital role in the well-being of players, and their ability to identify and manage head injuries can have a direct impact on the health outcomes for players (Echemendia et al., 2019). Therefore, further training and education opportunities tailored to the unique demands of football are essential.

Theme 2: Pressure

Performance staff that were interviewed believe there to be a lot of pressure from various factors when working at a FC. Their responses highlight a key tension between the demands of club management and the well-being of players, with performance staff acknowledging the pressure to expedite player recovery to meet the club's competitive goals. One performance staff member stated:

"Pressure from directors/managers or whoever it might be to get players back".

(Performance Staff 2)

This aligns with previous research that suggests external expectations often drive decision-making in professional sports, sometimes at the expense of player health (O'Connor et al., 2017). The notion that football is a "results-driven" environment is central to this dynamic. High performance expectations from management, coupled with the financial stakes associated with winning, place staff in a difficult position. As noted by the interviewees there is a direct push to accelerate a player's recovery to get a player back on the pitch quicker:

"Accelerate recovery or accelerate getting a player back on the pitch". (Performance Staff 3)

This pressure may contribute to a culture in which the long-term health risks associated with head injuries are underestimated in favour of immediate competitive outcomes (Macintyre et al., 2018). The push to return players to play prematurely has been linked to inadequate management of concussion and head injuries, and the consequences of such decisions can result in severe neurological issues (Guskiewicz et al., 2015).

Interestingly, these insights contrast with the more idealistic views expressed by coaches in their interviews, who often emphasised their prioritising of player's well-being over short-term results. However, as highlighted in this study, the reality appears to differ significantly amongst stakeholder groups, with performance staff acknowledging the competing demands of both player safety and team performance. This reflects a broader systemic issue in professional sports, where the focus on results can sometimes overshadow the importance of player health (McCrea et al., 2004).

Moreover, these findings also suggest a lack of consistent alignment between player safety and the operational pressures within Scottish FCs. While concussion management protocols are becoming increasingly standardised, the institutional pressures to prioritise immediate performance over long-term player health remain a significant challenge (Marshall et al., 2015). This highlights the need for a more robust, systematic approach to concussion

management in football, one that incorporates not only medical guidelines but also considers the organisational and cultural factors influencing decision-making.

Theme 3: Protocols

While the widely used phrase "If in Doubt, Sit Them Out" indicates an understanding of the potential severity of concussions, there is considerable variation in the implementation of formal protocols, particularly during the recovery phase. One key theme that emerged from the interviews was the use of baseline assessments at the start of the season to determine baseline levels for players in case they sustain a concussion or head injury throughout the season, specifically the SCAT5 (Sport Concussion Assessment Tool 5) test:

"I do SCAT5 tests during preseason for baseline levels". (Performance Staff 1)

This aligns with current recommendations in concussion management, as baseline testing helps provide a reference point for post-injury assessments (McCrory et al., 2017). The use of SCAT5 to assess players prior to the season is consistent with guidelines set by sports organisations such as the FIFA Medical Assessment and Research Centre (F-MARC), which emphasise the importance of pre-season baseline testing to effectively manage concussions (Guskiewicz et al., 2015).

One performance staff member stated that if a concussion or head injury is sustained, the player is assessed and then an appropriate recovery programme is put in place for them:

"Head injury assessments take place and then following the diagnosis, the appropriate protocols are put in place". (Performance Staff 3)

However, the same staff member advised there were no current protocols provided to follow when a player was recovering and returning from a concussion or head injury:

"There's nothing from the club's point of view for that". (Performance Staff 2)

This raises a significant concern by the participants in these interviews as there was a lack of standardised recovery protocols. This gap in official protocols is troubling, as it could result in inconsistent recovery management, potentially increasing the risk of further injury. A structured return-to-play protocol is critical for ensuring that athletes are not prematurely returning to training, which has been associated with increased risk of second-impact syndrome (McCrory et al., 2017). This issue is particularly relevant given that there is increasing awareness about the long-term effects of repeated concussions (McKee et al., 2013).

The absence of established recovery guidelines reported by one performance staff member highlights a significant gap in concussion management within their FC. Previous studies have shown that effective concussion management requires clear protocols, including stages for return-to-play based on clinical recovery (McCrory et al., 2017). Without these, players may be exposed to unnecessary risks, particularly in a sport where high-impact collisions are frequent and unavoidable. Furthermore, a lack of formalised procedures may lead to inconsistent decision-making, potentially influenced by external pressures to return players to the field prematurely (Dikici et al., 2019).

In contrast, several football organisations, including those in the UK and the United States, have developed concussion management strategies. For instance, the English Football Association (FA) has implemented a "concussion protocol" that includes detailed steps for diagnosis, management, and return-to-play, which has been shown to improve the consistency of concussion care (Broglio et al., 2017). This indicates that despite the existence of management protocols, they are not fully adopted by all Scottish FCs to ensure consistent care and reduce the potential for long-term consequences.

Theme 4: Awareness

It was highlighted that there was an increased awareness of concussion and head injuries among football performance staff, driven largely by enhanced media coverage over the past few years. Previous research indicates that public awareness campaigns and media coverage have contributed to heightened recognition about the risks of head injuries in sports (McCrory et al., 2017). However, despite these advances in awareness, the interviewees in this study emphasised that there is still significant work required to further educate all stakeholders:

"Increasing knowledge amongst not just performance and medical staff, but players and coaches too". (Performance Staff 1)

The necessity for greater awareness of the seriousness of concussion and head injuries would increase the understanding of both the immediate and long-term consequences within football. As one study participant highlighted, educating players and coaches about the risks of rushing back to play following a head injury could potentially reduce instances of early return-to-play, which has been linked to worsened health outcomes (McCrea et al., 2013). It might make coaches and players think twice about rushing back to training and playing:

"Players need to know how serious a head injury can be, what protocols are and then it allows them to have a realistic expectation if they do sustain a head injury". (Performance Staff 1)

Clear rules and regulations regarding concussion protocols are required to ensure consistency in the management of concussion and head injuries across all levels of football (Erlanger et al., 2003). Performance staff members stressed in their interviews that while these protocols are vital for the medical team's decision-making process, they are ultimately most important for protecting the well-being of the players. This emphasises the growing recognition that concussion management should not solely focus on return-to-play decisions but also consider the player's long-term health and career trajectory (Echemendia et al., 2017).

5.4.4 Parents

Parents who were interviewed had not received any training regarding treatment or aftercare of their child if they sustained a head injury. Most parents at best, had a very limited knowledge and understanding surrounding concussion and head injuries. This is concerning as their child would spend the vast amount of their recovery time at home with their parents. The three key reoccurring points identified from interviewing the five parents were – lack of knowledge, education, and awareness. Figure 5.7. below presents the parent's pen profile.

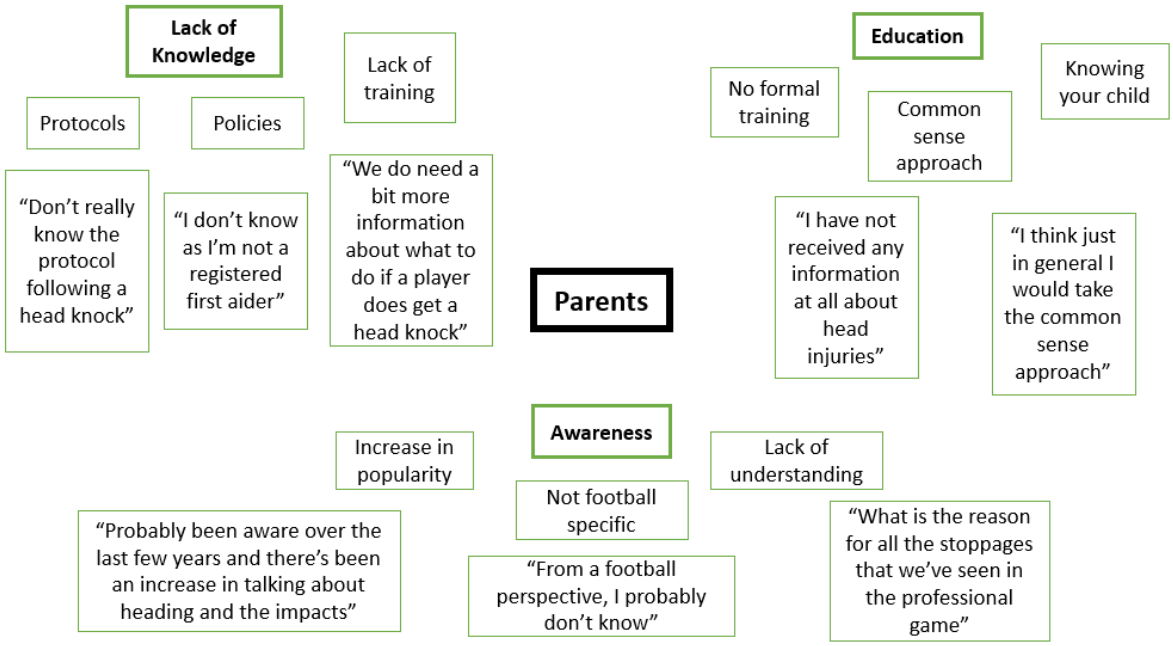


Figure 5.7. Parent's pen profile.

Theme 1: Lack of Knowledge

Lack of knowledge ties these three themes together. There is a lack of knowledge as no education has been provided on the topic of concussion and head injuries and as a result of this, there is limited awareness of the subject matter. This lack of training has resulted in parents not being aware of the current protocols and policies. One parent stated:

"Don't really know the protocols following a head knock" (Parent 1) whilst another parent stated: *"We do need a bit more information about what to do if a player does get a head knock".* (Parent 4)

Parents do not have the knowledge on the correct actions to take if their child sustains a head injury, meaning they are not best equipped to help with their child's aftercare/recovery.

Knowledge is key for parents. If they allow their child to return to training whilst they still have symptoms, they increase their risk of recurrent injury and other complications (Shrey., Griesbach., & Giza. 2011). An Australian study identified that only 7% of parents of children associated with sport were aware of the pre-injury concussion instructions or RTP guidelines from their sporting organisation, suggesting the implementation of the guidelines to be inadequate (Haran., et al. 2025). It is vital to raise awareness of the lack of education available to parents by developing seasonal educational sessions to update them with current best practices and to ensure they are knowledgeable on best practices for their child.

Theme 2: Education

A notable concern from the interviews is the lack of formal education surrounding concussion and head injuries, as many parents reported not having received any information about concussion management. This lack of education is in line with previous research, which has shown that many parents and coaches have insufficient understanding of concussion symptoms, protocols, and the potential long-term consequences of repeated head injuries in children and adolescents (McCrory et al., 2017; Harten et al., 2018). The absence of structured concussion education courses leaves parents relying on informal sources or their own understanding of the situation.

A common theme that emerged from the interviews with the parents was the reliance on a "common-sense" approach when dealing with head injuries. While this approach may seem

intuitive, it poses significant risks for underestimating the severity of the injury or builds in delays in seeking the appropriate medical intervention. One parent stated:

"I would take the common-sense approach". (Parent 5)

This approach, although well-intentioned, lacks the medical guidance necessary to ensure proper diagnosis, recovery and prevention of further harm. Parents' reliance on their personal judgment regarding their child's condition may lead to inconsistencies in the management of concussions. Studies have shown that concussion management can vary greatly depending on the individual's experience and knowledge, which can lead to inconsistent decisions regarding when to RTP or how long to rest (Baugh et al., 2012). The lack of formalised concussion protocols in many FCs further contributes to these disparities.

The issue of inadequate education also ties into broader concerns about the systemic nature of concussion management in football. Research suggests there is still variability in how concussion is approached and treated (McCrory et al. 2017). In youth football, where the physical risks are often greater due to the developing nature of players' bodies and brains, the absence of standardised concussion education for parents becomes even more problematic. Without formal training and awareness, parents are left to navigate these complex issues with limited resources.

Theme 3: Awareness

The increase in media attention surrounding concussion and head injuries in football was a primary factor in parents' awareness. Many participants reported that their understanding of these injuries had grown in recent years, reflecting the broader shift toward recognising the long-term risks associated with concussions. Previous studies indicate that media coverage has played a pivotal role in increasing public awareness of sports-related head injuries (Kontos et al., 2016; McCrory et al., 2017). As one parent highlighted, the growing media presence around

professional football and its impact on players has significantly contributed to their own knowledge of the issue:

"Probably been aware over the last few years and there's been an increase in talking about heading and the impacts". (Parent 3)

However, this study also identified a notable gap between awareness and understanding. While parents recognised the term "concussion" and understood it as a potential risk, their knowledge of the scientific rationale behind the safety protocols remained limited. This lack of understanding is consistent with findings from previous research, which suggest that increased awareness does not always correlate with a deeper comprehension of the complexities of head injury management (Field et al., 2003). Parents in this study expressed confusion about specific aspects of concussion protocols, such as the reasons behind stoppages in play at the professional level:

"What is the reason for all the stoppages that we've seen in the professional game". (Parent 4)

This suggests a need for more effective communication and education surrounding the guidelines and their purposes, particularly at grassroots level, where parents are more likely to have a direct influence on their children's participation.

Parents' lack of understanding about the reasoning behind concussion-related game stoppages is particularly concerning. While they expressed awareness of the increased focus on concussion management, their questions about the underlying rationale behind concussion-related game stoppages, points to a broader issue of insufficient education for those directly involved in youth sports. This is why there is a need for clear and transparent communication regarding concussion protocols, as that the more informed parents are on this subject matter, the more likely they are to support and adhere to these guidelines (Guskiewicz et al. 2007).

The confusion regarding professional-level concussion protocols may also influence how parents view similar measures at the youth level. If parents are unsure about the necessity of certain stoppages and safety protocols in professional games, they may be less inclined to accept and support these measures in youth football. This highlights the need for improved education, not just in terms of raising awareness of concussion and head injuries, but also in terms of providing clear explanations of the rules and their intended benefits.

The findings of this study underscore the need for more comprehensive education programmes for parents and coaches about concussion and head injury management. A greater emphasis on the reasons behind concussion protocols, particularly at the youth level, would likely enhance both understanding and compliance. Programmes should include information about the potential long-term consequences of head injuries, as well as the scientific evidence supporting current safety protocols (McCrory et al., 2017). Furthermore, the role of parents in reinforcing safe playing practices and supporting concussion management at home should be emphasised.

5.5 Overarching Weakness

From interviewing all five sub-groups, lack of knowledge is the key theme across all key stakeholders. Lack of knowledge is linked to or a result of most of the other themes which were highlighted by the sub-groups when they were interviewed. Figure 5.9. below presents the lack of knowledge pen profile. Everyone who was interviewed stated they would be willing to learn more, but there is no specific concussion or head injury training or education for any of these sub-groups. Figure 5.9 below presents the lack of knowledge pen profile.

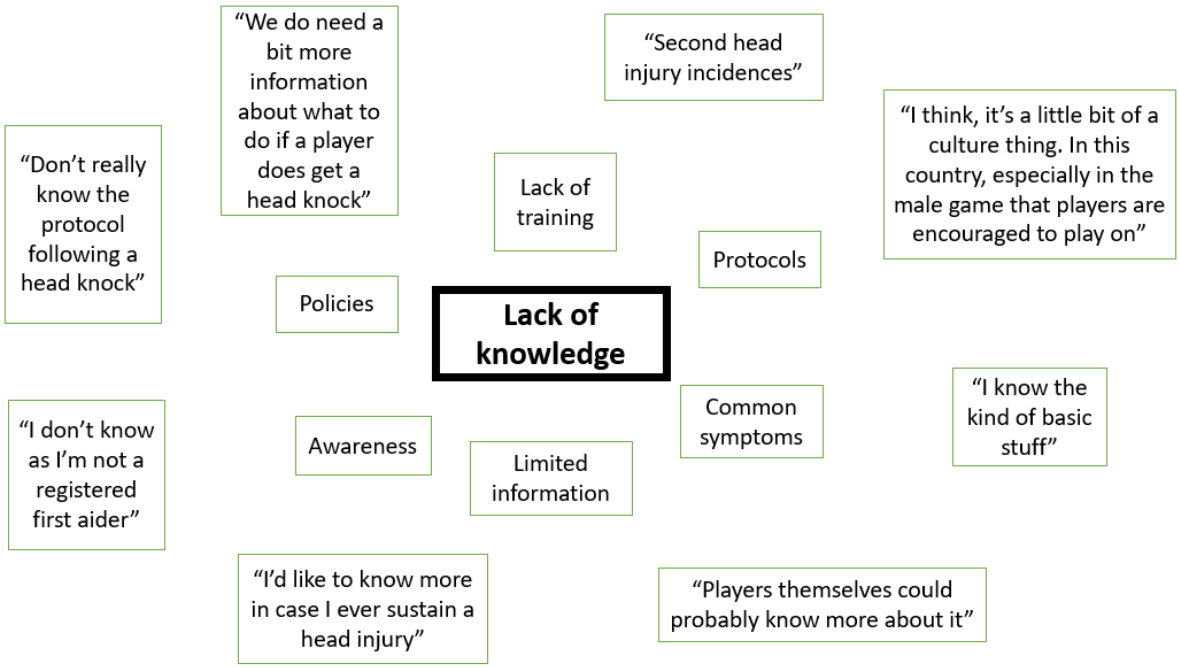


Figure 5.9. Lack of knowledge in the pen profile.

5.6 Limitations

Conducting research within my own professional environment presented both opportunities and challenges. On the one hand, my insider position granted me unique access to participants and contextual knowledge that would be difficult for an external researcher to obtain. This allowed me to capture nuanced insights, build rapport more quickly, and understand the subtleties of club culture. On the other hand, this proximity raised concerns about bias, power dynamics, and emotional involvement.

The main finding identified from this study was the lack of knowledge surrounding concussion and head injuries from each of the sub-groups. Despite protocols and procedures being in place, there is still a limited awareness and knowledge surrounding them i.e., protocols to follow if a player receives a head injury, RTP protocols and overall basic concussion knowledge.

Several participants were colleagues or players I worked with directly, which may have influenced their willingness to speak openly. While confidentiality and voluntary participation

were emphasised, I remain mindful that perceived hierarchies may have shaped some responses. Reflexivity was essential throughout, particularly when interpreting data that touched on organisational deficiencies or questionable decision-making. As a practitioner, I often found myself torn between sympathy for the pressures my colleagues faced and critical reflection on the consequences of those pressures.

A further limitation relates to the relatively short duration of the interviews. While the interviews lasted approximately 20 minutes on average (M = 20.3 minutes, SD = 2.4), longer interviews may have allowed for deeper exploration of participant experiences and perceptions. However, the shorter interview format was considered appropriate within the applied football academy environment, where time constraints and training schedules limited the availability of participants. Future research may benefit from conducting longer interviews or multiple interview rounds to further explore stakeholder perceptions of concussion and head injuries in football contexts.

These reflections have deepened my appreciation for the ethical complexity of conducting practitioner research. They also reaffirm the value of qualitative inquiry in illuminating the lived realities of sports settings, realities that often go unrecorded in formal documentation or policy. The insights gained from this study not only informed my own practice but also shaped the direction of the subsequent autoethnographic phase of this research project.

5.7 Conclusion

To conclude, the aim of this study was to gain a better understanding of five sub-groups knowledge and perceptions surrounding concussion and head injuries within an elite Scottish FC. The purpose of the interviews was to enable the interviewee to expand on their answers to the questions to allow the research team to gain as much insider knowledge as possible.

The lack of knowledge is a recurring theme amongst all sub-groups. As an applied practitioner, this is alarming as it ultimately suggests there is a relaxed approach from participants interviewed at the club and the SFA in terms of how they deliver and follow up on the adherence to their policies. The SFA have provided protocols and procedures; however, it is the responsibility of each club to ensure they are adopted and followed.

5.8 Personal Reflection and Professional Skills Development

This study proved to be a challenge to myself as an academic practitioner as I had never carried out interviews before, especially on a subject matter that was new to me. I had to familiarise myself with the appropriate protocols and procedures to improve my interview skills. For this, I had the help of my supervisor (Dr Simon Roberts), with whom we had regular meetings to develop the best and most effective interview questions. Questions were specific and tailored to each subgroup to ensure responses improved my understanding of the subgroups' knowledge and perceptions surrounding concussion and head injuries.

Once the interviews were complete and I was at the stage of analysing and presenting the data, I took guidance from my supervisor as I found this section to be the most challenging in the project. It was at this stage where I struggled with motivation as it was a form of research I had never carried out before. However, with the correct support I rose to the challenge of progressing each section and completing the study to a high academic level.

CHAPTER SIX.

STUDY III.

A qualitative Autoethnographic Study:

Navigating Concussion and Head Injury

Rehabilitation in Scottish Professional Football.

6.1 Abstract

This qualitative autoethnographic study explores my lived experiences as an applied sport and exercise scientist working within a Scottish Premiership FC, focusing on the ethical and institutional challenges involved in managing concussion and head injury rehabilitation. Drawing on three narrative case studies: *Adam's Exit Before the Curtain Falls, Backstage on the Touchline: (Not) Performing Care in Professional Football and Colin's Invisible Injury,* the research reveals the tensions between best medical practices, performance pressures, and player wellbeing during a relegation-threatening season. Through the dual lens of Goffman's dramaturgical theory and care ethics (Noddings, 1984; Cronin, 2023), the study examines how athletes, coaches, and practitioners engage in impression management while navigating return-to-play protocols. The findings demonstrate how concussion and head injury care is often performed in ways that mask uncertainty, suppress vulnerability, and reinforce institutional expectations of resilience. This research contributes to a growing body of sport science and coaching literature by critically examining the backstage realities of professional football, offering insights into hidden labour, moral complexity, and emotional burden of care in high-performance environments.

6.2 Introduction

Head injuries, particularly concussions, in professional football have garnered significant research interest due to their potential short and long-term health consequences (McCrory et al., 2017; Patricios et al., 2022). Despite growing awareness, effectively implementing structured rehabilitation programmes remains a complex challenge, often influenced by cultural, organisational, and psychological factors (Guskiewicz et al., 2005; Putukian, 2016). While governing bodies such as FIFA and UEFA have introduced concussion and head injury management protocols, their consistent application within club environments remains inconsistent (Echemendia et al., 2020).

The inconsistent application of concussion and head injury management protocols across different levels of football has also been highlighted in recent research. A study analysing concussion incidents during the "Copa America 2019" revealed that despite existing protocols, the low incidence rate of concussions at professional level, challenges the validation and consistent application of these protocols (Pangrazio., et al. 2024). Similarly, a systematic review emphasised that concussion management in sport is not standardised, exposing players to potential risks due to inconsistent adherence to protocols (Piedade., et al., 2021). These findings demonstrate the urgent need for unified guidelines to ensure player safety across all levels of play.

The FIFA+ Consensus Statement on Concussion (McCrory et al., 2017) defines concussion as a brain injury induced by biomechanical forces, typically resulting from direct or indirect impacts to the head, face, neck, or body. The injury leads to a complex physiological process affecting the brain, with symptoms that may be immediate or delayed, transient or prolonged. The Statement emphasises that concussions do not always result in loss of consciousness and that symptoms can include headaches, dizziness, confusion, memory impairment, visual disturbances, and emotional instability. Given the potential for cumulative and long-term neurological consequences, FIFA+ guidelines stress the importance of immediate removal from play, thorough medical evaluation, and a stepwise return-to-play protocol (McCrory et al., 2017).

The SFA have developed a comprehensive concussion awareness campaign, "If in Doubt, Sit Them Out," aimed at promoting the safety of players at all levels of the game (Scottish FA, 2023). This initiative emphasises the importance of a cautious approach to head injuries, recommending immediate removal from play and structured return-to-play protocols. However, despite these guidelines, challenges remain in ensuring adherence within

professional club settings, where performance pressures and cultural attitudes toward injury resilience can hinder proper concussion and head injury management.

In professional football, there is intense pressure to win driven by competitive demands, financial rewards, media scrutiny, and fan expectations. This can often lead to players returning to training and games before they fully recover from injuries. Clubs, managers, and even players themselves may prioritise short-term success over long-term health implications, risking the recurrence of injuries and chronic conditions (Ekstrand et al., 2011). Players can also feel compelled to play through the pain to maintain their position in the team (Orchard et al., 2005). This win-at-all-cost culture can compromise medical advice and ethical standards in player care, highlighting a conflict between performance and player welfare.

The pressure to win and the results-driven nature of professional sport can significantly influence the management of head injuries. A study involving athlete trainers and team physicians found that over 50% experienced pressure from coaches and athletes to prematurely return athletes to play post-concussion (Taft & Ennion. 2021). Further research in Norwegian Premier League FCs highlighted that return-to-play decisions were often influenced by the club's hierarchy, with coaches holding significant sway over medical decisions (Noesgaard & Sæther. 2024). These findings suggest that the organisational structure and performance expectations within clubs may compromise the ability of clinical staff to report and manage injuries effectively. In this context, Goffman's dramaturgical perspective offers a valuable lens to help understand how clinical staff may engage in impression management, presenting a compliant front-stage persona while privately grappling with the pressures to prioritise performance outcomes over player welfare.

6.2.1 What is an Autoethnography?

Autoethnography, as a qualitative method that combines autobiography (talking about one's life) and ethnography (studying culture), occupies a unique space in academic inquiry by foregrounding the researcher's personal experience as a lens through which to interpret broader cultural and organisational phenomena (Ellis et al., 2011). Researchers describe and systematically analyse their lived experiences to understand broader cultural, social, and political contexts in ways that quantitative or large-scale studies cannot (Cushion, 2014). In the context of applied sport science, where practitioner roles are deeply embedded in performance environments, autoethnography offers a powerful tool for exploring the often-unspoken realities of ethical tensions, emotional labour, and institutional complexities. This study builds on the work of Sparkes (2002) and McMahon et al. (2017), who advocate for the use of narrative forms to illuminate the 'messy' aspects of practitioner experience that quantitative metrics often overlook.

While autoethnography has often been criticised for perceived subjectivity or lack of generalisability, these critiques miss the value of situated, reflexive knowledge in complex applied contexts. The goal here is not to produce universally replicable outcomes, but to offer an intimate, ethically attuned account of concussion and head injury management in professional football, one that reveals how formal policies interact with culture, hierarchy, and individual judgment. By presenting a personal case narrative that resonates with the broader patterns identified in Chapters 4 and 5. This chapter aims to humanise the data and expose the lived challenges of navigating concussion protocols in high-stakes sporting environments.

Currently there is no research exploring the lived experiences of an applied practitioner specialising in concussion and head injuries within Scottish football. Therefore, this piece of research is unique and holds a key insight into the workings within football.

6.2.2 Goffman's Dramaturgical Perspective

Erving Goffman's dramaturgical perspective offers a nuanced framework for analysing the performative aspects of care in professional football environments. According to Goffman (1959), social interactions can be understood as theatrical performances in which individuals present themselves in specific ways to influence others' perceptions. His concepts of the front stage – the public persona presented to others – and the backstage – where true feelings and intentions are revealed - are beneficial for analysing the behaviours of coaches, medical staff, and players (Goffman, 1959). Goffman's idea of impression management highlights how individuals curate their actions and statements to align with societal expectations (Allan & Eys, 2020). In professional football, coaches may publicly advocate for player welfare to maintain a positive image, while privately pressuring medical staff to expedite recovery timelines (Potrac, Jones, & Nelson, 2014). Similarly, players might conceal symptoms of concussion and head injuries to avoid appearing weak or risk losing their position in the team.

In summary, explicitly engaging with Goffman's dramaturgical concepts has allowed me to clearly frame how impression management and role distance are enacted in elite sport contexts. This approach has provided greater theoretical clarity to my autoethnographic observations, aligning my reflections with established literature in the field of sport, particularly autoethnographic explorations of transitional identities and mental health in elite coaching roles (Stamp, Potrac & Nelson, 2023; Roberts et al., 2019).

6.2.3 Incorporating Care Ethics in Professional Football

Colum Cronin's work on care in sport coaching provides critical insights into the complexities of implementing care ethics in professional environments. Cronin (2018) argues that while care is essential, it must be balanced with professional accountability and safeguarding responsibilities to prevent care from becoming a tool for manipulation or control (Cronin & Armour, 2018). His research emphasises that genuine care in coaching must confront the

structural and ethical challenges posed by performance pressures, economic interests, and power imbalances in professional sports (Cronin, 2023).

By integrating a care perspective, this study explores the tension between providing empathetic care to players recovering from head injuries whilst adhering to the competitive demands and institutional imperatives of professional football. This approach challenges the traditional interpretations of care ethics, which often overlook the broader systemic barriers that prevent the consistent application of player welfare policies.

This study presents an autoethnographic account of my professional practice as a sport scientist embedded within a professional Scottish FC, where I was directly involved in the rehabilitation of concussion and head injuries. Concussions and head injuries remain a significant concern in football, both in terms of their acute management and long-term implications for the player's health. Within this high-performance environment, my dual role as both a practitioner and researcher provided a unique opportunity to critically examine the lived realities of implementing concussion and head injury protocols, interacting with a multidisciplinary team, and navigating the cultural and institutional pressures of elite football.

Autoethnography, as a method that blends personal narrative with critical analysis, offers a powerful means of investigating these complexities from an insider perspective. By reflecting on my own experiences, decisions, and observations, this study aims to contribute both to academic understanding and practical application in the field of sport science and player welfare.

The research objectives that guide this inquiry are as follows:

1. To critically reflect on my experiences as an applied sport scientist involved in the rehabilitation of concussion and head injuries within a Scottish professional FC setting.

2. To explore practical challenges, ethical dilemmas, and interpersonal dynamics encountered when implementing concussion and head injury management strategies.
3. To evaluate how institutional, cultural, and performance-driven factors within a club can influence the delivery and perception of concussion and head injury management.

6.3 Methods

This autoethnography enabled me to explore concussion and head injuries through a deeply personal lens, one rooted in lived tension, ethical complexity, and practitioner vulnerability, offering a unique insight into the under-explored cultural and real-life workings within a professional FC environment.

6.3.1 Research Context and Research Setting

This study is situated within the professional environment of a Scottish Premiership football league club, where I worked as a sport and exercise scientist, alongside the head of medical (Mark), responsible for the assessment, management, and rehabilitation of first-team player injuries, including concussion and head injuries. My role involved collaborating closely with management, coaching staff, medical professionals, and players to implement evidence-based rehabilitation and return-to-play protocols. During the season under study, the club was engaged in a relegation battle and spent most of the season near the bottom of the Scottish Premiership league table.

This high-pressure context significantly amplified the club's performance-driven culture, intensifying demands on medical and sports science staff to expedite player recovery times, despite established medical guidelines. The urgency to secure points and avoid relegation often led to conflicts between medical best practices and the imperatives imposed by coaching staff and management. As a result, I was often positioned at the intersection of ensuring player safety

and addressing the team's immediate performance needs. This environment provided a unique lens for exploring the complexities of concussion and head injury management in professional football and informed the decision to use an autoethnographic methodology for this study. By incorporating Goffman's insights, this study critically examines the authenticity of care practices in professional football, exposing the tensions between genuine concern for player welfare and the performative compliance driven by institutional pressures.

6.3.2 Autoethnographic Case Study Approach

Why an autoethnography?

A well-structured autoethnography captures the specific contexts of lived experiences, such as social interactions. Autoethnographies delve into the process by which social and personal experiences intersect and how these may influence an individual's identity development.

This study adopts an autoethnographic case study approach to explore the complexities of concussion and head injury management in professional football through the lived experiences of the researcher (Erin), working as a sport and exercise scientist within the Scottish professional football environment. This approach focuses on the rehabilitation of three anonymised first-team players (Adam, Ben, and Colin) who sustained different head injuries during the season, providing a series of distinct, yet interrelated cases, that illustrate the broader challenges and pressures associated with injury management. These cases illustrate the complexities of concussion and head injury management under the performance-driven pressures of the Scottish Premiership.

Adam

Adam is a highly experienced first-team defender who suffered a concussion after a high-impact collision during a match, displaying immediate symptoms including dizziness and nausea. Despite medical advice for a gradual return, pressures from coaching staff amid a relegation battle led to a rushed RTP. In his next game, Adam appeared disoriented after another 50/50 header and was visibly disoriented. At halftime, he vomited, had a sore head, and was substituted. A staff member arranged for his wife to take him home, and he remained in regular contact with the Head of Medical over the weekend.

On returning to training, Adam avoided pitch or gym work, focusing on SCAT5 assessments, treatment, and light exercises. As the January transfer window approached, he remained out of full training and was later transferred to a new club in England. It remains unclear whether he fully recovered or withheld the full details of this injury to protect the transfer to a new club.

Ben

Ben is another highly experienced first team midfielder who suffered a concussion after a high-impact collision that left him unconscious on the pitch. The game was paused for 15 minutes while he received care from on-site paramedics. Although an ambulance was initially called, it was cancelled once Ben regained consciousness and was assessed. He was sent home to rest for the weekend, maintaining contact with the Head of Medical over the weekend.

Following SCAT5 testing and light gym work, Ben returned to training on the Monday. His workload was gradually increased, including neck-strengthening exercises, as his symptoms improved. However, due to a depleted squad and the club's relegation battle, his return-to-play protocol was cut short, and he was used as a substitute during a game.

In the match, it became apparent Ben was avoiding headers, something he later admitted was due to lingering dizziness and concern over re-injury. Despite the club's tense atmosphere, he

reduced his training and prioritised his recovery and recognised the potential long-term risks. He reflected that early and post-injury brain scans could have justified a more cautious recovery and helped avoid any assumptions of malingering.

Ben eventually made a full recovery but remains cautious about potential long-term effects of head injuries.

Colin

Colin, a first team forward, was the third player that season to suffer a concussion after a high-impact 50/50 collision during a game. Although he initially played on, worsening symptoms led to his substitution. A teammate drove him home afterwards and he stayed in contact with the Head of Medical.

Colin remained off for a few days due to lingering symptoms. However, his reputation as a "chancer" led some staff to doubt the severity of his injury, given the invisible nature of concussions. He underwent a brief rehab period but was soon returned to full training, amid doubts that he was exaggerating his symptoms to avoid harder training sessions.

In a subsequent match, Colin reported another suspected head injury and appeared visibly upset and disoriented. He was placed on a phased return to training. By then, the manager had grown frustrated with Colin's attitude and delayed his reintegration. Eventually, to avoid perceptions of favouritism, Colin resumed full training.

He fully recovered from the concussion, but towards the end of the season after relegation was confirmed he picked up another injury that ruled him out

6.3.3 Data Collection Techniques

To ensure a comprehensive understanding of the rehabilitation process and its challenges, multiple data collection techniques were employed:

2. Field notes – systematic documentation of daily observations, interactions, and reflections.
3. Observations – non-participant and participant observations were conducted.
4. Conversations with players and coaching staff – informal discussions and structured reflections.
5. Self-reflection journals – regular personal reflections for critical analysis.

6.3.4 Data Analysis: Narrative Analysis

In undertaking the narrative analysis of this autoethnographic study, I systematically applied Riessman's (2008) framework, which emphasises data selection, detailed analysis of narrative structure and content, and interpretive reflection. In each of the steps below, I clarify my narrative analytical approach explicitly and reflect critically on how my positionality influenced my interpretations.

6.3.5 Data Selection

Data selection followed a purposeful sampling strategy guided by Riessman's (2008) emphasis on narratives to provide rich insights into personal and cultural experiences. Initially, I collected reflective journal entries, informal conversations, and detailed observational notes made during and after significant interactions related to concussion management in my professional sports environment. From this extensive corpus, I selected key narratives based on their depth, clarity, emotional resonance, and direct relevance to the dramaturgical themes of frontstage/backstage behaviour, impression management, and role distance (Goffman, 1959). For example, player

narratives and my reflective diary entries were deliberately chosen for their ability to vividly illustrate conflicts between institutional pressures and personal ethical dilemmas.

6.3.6 Analysis of Narrative Structure and Content

Following Riessman's (2008) methodological approach, I analysed narratives through thematic and structural lenses. This involved the following stages:

- Close reading: Each narrative was first read multiple times to achieve immersion in the data, identifying initial patterns and themes.
- Structural analysis: I paid attention to how narratives were told, including order of events, use of metaphors, and emotional language. For instance, the narrative recounting Adam's premature RTP was analysed structurally to reveal the tension and emotional complexities underlying clinical decisions.
- Thematic analysis: Key recurring themes, such as 'ethical conflict', 'professional pressure', and 'player welfare', were systematically identified across narratives. These themes were explicitly linked to dramaturgical concepts, enabling a coherent theoretical framing of the narratives within Goffman's perspective.

This combined structural and thematic analysis allowed me to articulate how specific narrative features (such as sequence, metaphors, tone, and emphasis) contributed meaningfully to understanding broader social dynamics within the sporting environment.

6.3.7 Interpretive Reflection and Positionality (Etic/Emic)

Interpretation followed Riessman's (2008) recommendation of reflexively considering researcher positionality - my dual insider (emic) and outsider (etic) roles profoundly shaped my narrative interpretation. My insider status as the sports scientist allowed intimate familiarity with institutional language, behaviours, and norms, affording authentic insight into nuanced behaviours often concealed in official settings. This insider perspective facilitated deep

empathy with the pressures experienced by players and staff and provided nuanced, context-rich interpretations of events. Conversely, my etic perspective as the researcher prompted critical reflection, enabling me to identify and challenge my biases, assumptions, and emotional entanglements. My analytical memos frequently captured moments of tension between my personal empathy for players and professional responsibility to critique institutional practices. This dual positionality was particularly evident in interpreting the backstage narrative regarding Adam's rehabilitation, where my professional role demanded objectivity, yet my personal ethical discomfort was palpable.

Thus, my positionality was explicitly accounted for by continually questioning and documenting how my professional experiences, emotional involvements, and theoretical frameworks influenced my interpretations. Riessman's (2008) reflective approach ensured analytical transparency and methodological rigour by systematically integrating my positionality into the analysis process, thereby enhancing the trustworthiness and depth of the narrative interpretations.

6.3.8 Ethical Considerations

Given the autoethnographic nature of this study and the inclusion of professional footballers who may still be active or under contract at other clubs, particular care has been taken to protect the identity, privacy, and well-being of all individuals who participated in the study. Ethical approval for this research was granted by LJMU Research Ethics Committee (22/SPS/016) prior to data collection and writing. Although the primary data is derived from my own lived experiences and professional reflections, these experiences involved close interaction with players, coaches, and medical staff within a high-performance setting. To mitigate any risk of identification - whether direct or indirect – all names used in this thesis are pseudonyms, and identifying details such as playing position, injury specifics, timelines, match outcomes, or personal characteristics have been deliberately altered, generalised, or omitted.

This approach follows ethical best practices in autoethnographic research, where the risk of indirect identification remains high due to the deeply contextual and relational nature of the work (Tolich, 2010). As such, narrative accounts have been constructed with attention to what Ellis (2007) refers to as "relational ethics" - an approach that recognises the researcher's responsibility not only to participants but to the broader social relationships embedded within the story. No club names are mentioned in conjunction with specific events that could lead to re-identification. Composite characters and blended narratives have also been employed where appropriate, a technique endorsed by Chang (2008) and Sparkes (2007) to protect identities while preserving the authenticity of the researcher's experience.

Throughout the writing process, I was acutely aware of the power dynamics involved in practitioner-research and the ethical responsibility to safeguard the dignity and privacy of all those involved. Careful attention has been paid to tone, representation, and the use of reflective writing to ensure that the study prioritises ethical integrity over sensationalism or personal exposure (Adams, Holman Jones, & Ellis, 2015). No direct quotations or data from these phases have been used in the autoethnographic narratives unless ethically justified and appropriately anonymised. In line with best practices in narrative inquiry and autoethnography, I acknowledge that complete anonymity can never be fully guaranteed in small, close-knit professional communities such as those in elite sport (Sparkes & Smith, 2009). However, every reasonable step has been taken to minimise this risk and uphold the ethical principles of respect, integrity, and care, as outlined in the British Educational Research Association (BERA, 2018) and the Association for Qualitative Research (AQR) guidelines.

What follows is my autoethnographic account.

6.4 Adam's Story: The Exit Before the Curtain Falls

Adam was one of our most senior players, a defender with years of top-flight experience in both English and Scottish professional football. A quiet leader, he did not need to raise his voice to command respect. His presence alone had a calming influence on the team. In the dressing room, his experience spoke louder than words, and on the pitch, his intelligence and composure made him an invaluable asset.

In the 50/50 aerial challenge, Adam collided with an opponent in a way that could be heard clearly from the touchline. It was one of those impacts that made you wince, even from a distance. When Adam got back to his feet, something was not right. His movements were slow and uncoordinated. His eyes did not track properly, and he had trouble steadying himself. The signs were all clear of a concussion: dizziness and nausea.

Following the established medical protocol, Mark, our Head of Medical, and I acted quickly. We removed Adam from the pitch, assessed him, and documented his condition. However, from the moment Adam stepped off the field, the pressure from the coaching staff began.

"How long is he going to be out?"
"Will he be ready for next weekend?"
"Surely, he's experienced enough to manage it. He's probably had it before, right?"

The club was in a relegation battle. Every game was crucial. Every absence felt like a blow. Adam was not just a player; he was a linchpin of the defence, a player we could not afford to lose for long. The stakes were high, and the urgency for Adam to RTP was palpable. The pressure to fast-track his recovery was overwhelming, but we stuck to our guns, following the guidelines, even though the team needed him on the pitch.

Despite the clear need for caution, Adam was cleared after a brief rest period. SCAT5 protocols were followed, and after a short recovery, he was named in the starting eleven for the next match. We all knew the timeline was tight, but Adam was eager to get back into action.

From the first moments of the game, though, I had a nagging feeling in the pit of my stomach. It was not just the usual sense of unease you get when watching a player in a potentially risky situation. No, something felt off. Then came the header, a routine challenge that should have been nothing out of the ordinary. But when Adam stood up after the clash, it was apparent that something was wrong. His eyes were glassy, his posture slack, and there was an undeniably dazed look on his face. He was not just tired. He was disoriented.

Despite everything, Adam pushed through the rest of the half, perhaps caught between his natural resilience and his desire to help the team. He had that mentality, the one that has been drilled into players at the top level: push through, do not show weakness, and be there for your team. But it was clear to me from the side-line that he was walking a dangerous line.

When halftime came, the mask finally fell. Adam slumped into his seat in the changing room, looking completely disoriented. It did not take long before he vomited violently onto the floor. His head was in his hands, his face pale, and he could not shake the dizziness or the pain. It was clear now that he was in no condition to continue, and we immediately pulled him from the game. A staff member stayed with him, offering comfort, while we arranged for further assessment from the club's doctor. Mark called Adam's wife to make sure she could collect him and take him home.

Over the weekend, Adam stayed in regular contact with Mark. He reported ongoing symptoms: dizziness, headaches, and nausea. It was clear to everyone that he was not well, and the road to recovery was going to be longer than anticipated.

When Adam returned to the training ground the following week, he did not jump straight back into full-team drills or run high-intensity fitness tests. Instead, he followed a modified programme which was cautious, gradual, and designed to monitor his recovery every step of the way. Every morning, he completed his SCAT5 test to assess his cognitive function, and he received soft tissue therapy and stretching exercises. The intensity of his training was kept deliberately low. It was a slow reintroduction to physical activity, one step at a time.

However, something felt different, not just physically with Adam, but emotionally too. It was as if the entire situation had shifted. The dynamic had changed. It was January, the transfer window was opening, and Adam, like all players in his position, knew what that meant. A new chapter. A fresh start, possibly with a different club, with other opportunities.

Adam did not push himself to the limit in training. He kept a low profile, avoiding high-intensity work, taking it easy in the gym, and staying away from anything that might put extra strain on his body. At the time, it was hard to tell: was he still symptomatic, or was he simply being strategic? Had he figured out the risks to his health and decided that it might be wiser to preserve himself for a potential transfer to a new club? After all, if he pushed too hard and showed any signs of further concussion symptoms, his chances of securing a transfer could be affected.

As the days passed, it became clear that Adam was not in a hurry to return to full fitness. Whether it was because he knew his body was not fully recovered or because he was playing it safe for his future, we will never really know. But as the transfer window approached its closing deadline, Adam secured a move to a club in England. It was a quiet exit, no fuss, just a smooth transition that was both expected and, in some ways, inevitable.

In the end, I still do not know if Adam fully recovered. He followed the protocols, ticked all the right boxes, and performed the return-to-play rituals as expected. He appeared fine on the surface. But maybe, deep down, Adam recognised the script before it unfolded. He saw where things were heading and chose to write himself out of the story before it could ask too much of him. Perhaps he understood the risks to his body, his future, and the potential toll that continuing down this path might take.

Maybe he chose to protect himself, his health, his career, and or his future. And perhaps, just perhaps, he had enough self-awareness to know when it was time to step away from this particular club.

I'll never really know for sure. But Adam's exit, quiet as it was, left a lasting impression. He was not just leaving the team; he was going on his own terms, navigating a situation few could truly understand. It's something I'll never forget, even if the answers will forever remain out of reach.

6.5 Backstage on the Touchline: (Not) Performing Care in Professional Football

I vividly recall one performance team meeting as we ran through preparations for the upcoming home game. Training was about to start, and there was a palpable sense of urgency. Ben had been concussed just three days earlier, knocked clean out. An ambulance had been called, then cancelled. The whole situation had been a chaotic blur.

"So, is he training today or not?" the assistant coach snapped, barely looking up from his iPad as he flicked through the squad list. "I need to finalise the session plan." He tapped the screen hard, like the delay was already costing him time.

“Still dizzy,” I said. “No pitch work, just light gym today.”

Mark, the head of medical, looked up from his notes. “He’s not ready. It’s too soon. We need to follow the protocol.”

There was a pause, long enough to feel awkward.

“We’re light this weekend,” the manager muttered, eyes fixed on the tactics board. “It’s only a bit of dizziness, no?”

“It’s a head injury,” Mark replied, more firmly. “You don’t take chances with those.”

No one responded. The conversation moved on. No follow-up. No concern. Just strategy.

That day, I watched Ben go through the motions: stationary bike, band work, and slow neck rotations. He did everything asked of him, but his face gave him away. He was pale, withdrawn, and hesitant. So, when the matchday squad was announced two days later, both Mark and I looked at each other in surprise. Ben’s name was on the list. No conversation. No clearance discussion. Just quietly placed back into the mix. We had expected more time, more caution. But there he was. The decision had already been made.

Ben was brought on in the second half. From the side-lines, I could see it immediately; something had changed. He wasn’t going up for headers. In situations where he’d normally attack the ball in the air, he was letting it drop, cushioning it with his chest, bringing it to ground. Small decisions that went unnoticed by some, but not by the manager or coaching staff. A lost possession in midfield can turn into a goal conceded. In games like that, every decision is scrutinised.

After the final whistle, Ben pulled me aside.

“You see me avoiding headers today, Erin?” he asked, barely above a whisper.

I nodded. “Yeah … are you okay?”

“Not really,” he admitted. “Still getting dizzy spells. But I can’t say anything … or I’m out.”

He was honest, but afraid. Still symptomatic, still uncertain, but trying to survive in an environment that demanded silence. He didn’t want to draw attention to himself. The atmosphere around the club was tense, heavy with uncertainty. Relegation was looming. He felt like any sign of weakness might push him closer to the exit door. Ben continued to train, but over time, he admitted he still didn’t feel right. He was carrying the weight of his symptoms in silence, fearful of speaking up, of being dropped, of being seen as vulnerable.

That conversation broke something in me. That’s when Goffman’s work began to make sense, not just theoretically, but viscerally. We were all in costume. I'm in my club tracksuit. Ben is in his training kit. The manager pacing in his branded club gear. We weren’t just managing injuries; we were managing impressions. On the front stage, everything appeared to be under control: structured rehab, clean data, optimistic check-ins. “RTP” was the metaphorical theatrical performance. The scripts were rehearsed, the cues familiar. But backstage, behind the scenes, there was fear, doubt, and silence. Ben was scared he wasn’t okay. I was scared we’d sent him back too soon. Mark looked uneasy but stayed quiet. No one was sure, yet everyone played along.

Goffman (1959) spoke of the presentation of self, in which individuals perform roles in accordance with the expectations of their audience. Ben played the part of the recovering athlete, composed, compliant, present. I played the practitioner, reassuring, measured, and professional. We both knew the performance was brittle, but we kept it going. We had to. The stakes were too high.

I wasn't just supporting his rehab; I was sustaining the illusion. I was part of the cast, part of the set, helping the scene unfold. We were all performing care, but the act wasn't always safe. It was tidy. Efficient (probably). Palatable (perhaps). But underneath, the truth was messier. We were performing recovery, but neither of us felt recovered.

6.6 Colin's Story: The Injury No One Sees

Colin's concussion didn't look like much at first. A clash. A stumble. He stayed down a little longer than usual, then got back up and played on. No blood. No drama. Nothing that would draw a VAR replay, no big deal. Just another knock in a game full of them. It wasn't until afterwards, in the quiet of the treatment room, backstage, that the cracks began to show.

"I just don't feel right," he said softly, sitting on the edge of the medical bed, head in his hands. His voice didn't sound like his. Slower. Flatter. Like he was searching for clarity.

At that moment, something was different. He wasn't the same Colin who usually bounced back from injuries with a smile or an attempt at bravado. This time, something deep had shifted within him. The reality of the concussion wasn't just physical. It had touched something more intangible, the psychological and emotional toll of trying to push through a head injury that wasn't visible, that no one could measure with a scan or a simple test.

We gave him time off. Followed the steps. Did what we were supposed to. But the whispers started almost immediately.

"He's at it again."

"Always finds a way out."

"Fancies a few days off, doesn't he?"

The pressure to perform never really stops, especially when you are part of a team where toughness is a currency. In this world, you're only as valuable as your ability to show up. To be present. To power through the pain. And yet, here was Colin, vulnerable and uncertain, sitting in a treatment room trying to explain a feeling that no one could see, no one could measure. The invisible nature of his injury made it that much harder to be believed.

That's the danger of the front stage, where toughness is currency and invisibility means illegitimacy. No visible wounds, no injury. And in a culture obsessed with control and reliability, anything less than full presence becomes suspect. A player's reputation becomes part of the performance, and Colin's was being quietly rewritten in real time. The coaches and staff didn't believe the injury was as serious as he was making out, primarily since Colin was known to be a 'chancer.' The whispers quickly turned to doubts, doubts that made it even harder for him to be honest with himself about his own struggles. He was caught in a cycle of trying to prove he was okay when deep down, he wasn't.

When he returned to training, we kept the sessions light, monitored, and gentle. It was all part of the protocol, part of the careful, structured approach to concussion recovery. But that, too, came with its own challenges. The pressure was mounting, and I caught flak for it.

"He needs to do more."
"He's milking it."

Care, it seemed, was being mistaken for indulgence. The performance wasn't convincing enough. The expectations weren't being met. So, I began to wonder, was I doing enough? Was I being overly cautious? Was I sheltering him from the very system that, in the end, might reward him for pushing through pain, even when that pain could be doing long-term damage?

Then one day, after a light session, I found him standing alone in the corridor. Just standing. Back against the wall. Still in his kit. Staring down at his boots like they might have the answer. The hallway was quiet, a momentary pause in the frantic rhythm of training.

"When will I feel better again?" he asked. He didn't look up when he said it. The mask was off. And I didn't know what to say. I still don't.

That question haunts me. Because it wasn't part of the script, it wasn't polished or rehearsed. It was real, raw, and unprotected. No longer a player performing recovery, just a person asking for reassurance in a world that had become unrecognisable to him. A world where his value was tied to his presence and performance, but neither of those things was available to him in the way they had been before.

What do you do when the performance stops? The truth is, there isn't a simple answer. We know the protocols. We know the steps we're supposed to follow, the return-to-play guidelines, gradual reintroduction into training, and monitoring for symptoms. But the human aspect, the part that isn't captured on a report or a test, is more challenging to manage. Colin wasn't just recovering from a concussion. He was recovering from the emotional toll of feeling like he couldn't be himself in a place that valued *performance* above all else. And yet, the world outside the treatment room kept demanding that he perform recovery, as if it were just another drill, just another test to pass.

We phased him back to play, carefully, cautiously, and incrementally. Back into a system that rewards strong performances and punishes unscripted weakness. A system that struggles to accommodate uncertainty, where symptoms without metrics and pain without spectacle don't fit the role. Back into a front stage that expects composure, progression, and presence, even when the backstage reality is filled with doubt, dizziness, and fear, the physical injury was just

part of the story. What was harder to address was the emotional and psychological strain, the doubt, the vulnerability, and the fear that Colin could never quite articulate.

These moments reshaped how I see my role. Don't get me wrong, I still believe in the science and in the process, in the structure of return-to-play protocols, but now I understand the deeper layers, the dramaturgy of recovery. The way players perform wellness. The way practitioners manage impressions. The subtle choreography we all engage in, trying to look competent, composed, and in control.

There is a performance to recovery. It's not just about the body getting back to form; it's about the narrative that surrounds it, the one that the coaches, the fans, and even the players themselves are trying to write. We talk about "staying strong" and "fighting through" injury, but in doing so, we often overlook the moments when true recovery happens in the quiet spaces, the unspoken places where the mask slips.

The performance of recovery isn't just about returning to the pitch. Sometimes, the most ethical decision does not live in a test or a protocol. It lives in silence. In hesitation. In standing still in a corridor with a player who's dropped the act. And in choosing to protect them, not just when they admit they're hurting, but especially when they feel they can't.

It's easy to get caught up in the metrics, the numbers, the deadlines, and the expectations, but true care doesn't always fit into those boxes. Sometimes, care looks like standing beside a player who's too tired to ask for help and too scared to admit things aren't okay. It's about allowing them space to heal in ways that can't be quantified. Colin's recovery wasn't just about getting back on the field; it was about finding the strength to let go of the performance and face what was really going on beneath the surface.

And perhaps that is the most important lesson we can learn. The most ethical decisions we make are not always the loudest or the most visible. Sometimes, the best we can do is stand still for a moment, listen, and allow healing to happen in the quiet spaces.

6.7 Critical Discussion

This critical discussion chapter brings together the autoethnographic narratives, methodological reflections, and theoretical lenses explored throughout the study. It aims to synthesise key insights by drawing on wider literature, including the work of Goffman (1959), Noddings (1984), and Cronin (2018; 2023), to illuminate the cultural, ethical, and institutional complexities of concussion care in elite football. Central to this discussion are the themes of impression management, constrained care, and the dramaturgy of recovery, as embodied in the lived experiences of Adam, Ben, and Colin.

6.7.1 Rehearsing Recovery: When Protocol Becomes Performance

Across all three narratives, there was a striking similarity in how recovery was staged. The SCAT5 tests, the gradual return-to-play routines, and the structured milestones were not just clinical tools; they became performative rituals. As Goffman (1959) suggests, individuals present curated versions of themselves in social settings, often aligning their behaviour with the expectations of the audience. In these cases, Adam, Ben, and Colin were not only recovering footballers, they were actors, engaging in what Goffman terms "front stage" performances of compliance, resilience, and readiness.

However, backstage, the reality was different. Players reported symptoms, hesitated over headers, expressed confusion, or questioned their own recovery. As in Colin's corridor moment, "When will I feel better again?", these interactions exposed the emotional and cognitive dissonance between the internal experience of injury and the external performance of progress. This aligns with existing research on athlete impression management, in which

hiding symptoms serves as a strategy for self-preservation in selection and contract-sensitive environments (Wolanin et al., 2015; Putukian, 2016).

6.7.2 The Culture of Suspicion and the Fragility of Care

In all three cases, expressions of care were shadowed by doubt. Adam's strategic withdrawal was tolerated only because of an impending transfer, Ben feared being seen as weak, and Colin was quickly branded a "chancer". These examples demonstrate what Cronin (2023) identifies as a key challenge in elite sport: the precariousness of care. While care is professed institutionally, it is often conditional, subject to role expectations, team dynamics, and performance pressures.

Drawing on Noddings' (1984) ethics of care, genuine care requires relational attentiveness and a commitment to the unique needs of the cared-for. However, in a results-driven environment, this relationality is often overridden by structural demands. Cronin and Armour (2018) warn that when care is co-opted by institutional logic, it becomes hollow, even reduced to optics or performance. The rehabilitation journey of Ben, who was cleared without proper consultation, exemplifies this risk. As a practitioner, my complicity in this illusion, ticking boxes, nodding through progressions, felt like a betrayal of both the athlete and the science.

6.7.3 Managing Up and Out: Organisational Power and Ethical Strain

The pressures to accelerate rehabilitation timelines came not from players but from the leadership group, from coaching staff, team management, and performance expectations. Research in football and rugby (Noesgaard & Sæther, 2024; McNamee et al., 2021) highlights how medical staff are frequently subject to top-down pressure, expected to justify absences and accelerate returns without compromising player safety, an impossible task. In Adam's story, the illusion of clearance created plausible deniability for all involved. He ticked every box, but

when he collapsed at half-time, it became clear that protocol had substituted judgment. The performance had succeeded. The care had failed.

Goffman's (1959) concept of "role distance" is useful here. As a practitioner, I often felt torn between my identity as a caring clinician and the club's expectations. I was in role, but emotionally distant, disillusioned, frustrated, and uncertain. The dramaturgical pressure to maintain composure and control, to act as though care was being delivered safely and consistently, created a sense of internal role conflict (Miller & Kerr, 2002).

6.7.4 Acts of Resistance: Where Care Becomes Ethical Again

Despite these tensions, there were flickers of authenticity. Sitting silently with Colin in the corridor. Listening to Ben's quiet confession. Slowing Adam's gym progression, even when questioned. These small, relational acts represented what Noddings (1984) refers to as motivational displacement, putting the needs of the cared-for at the centre, even within a constrained system. They also echo Tronto's (1993) argument that genuine care in professional settings requires courage, attentiveness, and responsiveness, qualities often in tension with institutional efficiency.

These moments matter because they are ethically generative. They represent choices to hold space for vulnerability, ambiguity, and dissent, qualities often erased in the pursuit of clinical neatness and sporting success. As Sparkes and Smith (2009) argue, ethical practice in sport demands more than evidence-based frameworks; it requires relational awareness and narrative sensitivity.

6.7.5 Implications for Concussion Care and Practitioner Identity

This study suggests that concussion and head injury care in elite football cannot be reduced to protocol adherence alone. Instead, it must be understood as a relational and performative process shaped by institutional culture, power dynamics, and practitioner identity. Practitioners

are not just implementers of science; they are mediators of care, often forced to navigate between doing what is clinically right and what is organisationally acceptable.

The identity tensions experienced between the sport scientist and the ethical human reflect broader concerns in the literature about the emotional labour of care in sport (McMahon & Dinan-Thompson, 2011; Roberts et al., 2019). This tension is intensified in autoethnographic research, where the researcher's emotions serve as both data and analytic lens.

Future research could leverage these findings to investigate concussion rehabilitation practices across diverse international sporting contexts, including comparative analyses of different football leagues and high-impact sports such as rugby, American football, and ice hockey. Exploring broader institutional and cultural dynamics, such as the roles of governing bodies, the media, and public perceptions, would significantly enhance understanding of the global ethical tensions surrounding player welfare and organisational pressures. Additionally, longitudinal studies examining practitioner identity and ethical decision-making across different career stages and cultural contexts could inform targeted professional education and policy development. Ultimately, explicitly integrating dramaturgical theory and care ethics into international concussion management frameworks has the potential to establish ethically robust practices and standards that prioritise athlete wellbeing worldwide.

6.8 Conclusion and Implications

In critically reflecting on my own role and the experiences of Adam, Ben, and Colin, this chapter argues that concussion rehabilitation in elite football is shaped by competing logics: the logic of care and the logic of performance. By drawing on Goffman, Noddings, and Cronin, I have highlighted how these logics collide, overlap, and sometimes co-exist uneasily within the same space.

Autoethnography has offered me a way to both tell these stories and interrogate them, bringing the backstage realities of concussion care into the spotlight of academic critique. It has enabled me to acknowledge not only the structural constraints of my environment but also the personal moments where I could, and sometimes did, act differently. These moments, however small, are where care reclaimed its ethical significance. And it is in these moments that real change – slow, human, and often quiet – might begin.

Engaging in autoethnographic research blurred the boundaries between observation, interpretation, and participation. As an insider, I had privileged access to the subtleties of organisational culture, unspoken norms, micro-interactions, and informal power structures, but this access also required careful reflexivity. I had to be constantly aware of how my positionality shaped not only what I observed, but how I interpreted and represented it.

This was particularly challenging when addressing incidents that involved colleagues or power dynamics. My loyalty to the club and its staff was truthful, and I had to balance this with a commitment to honest, critical self-reflection. Journaling became an essential tool not just for recording events, but for interrogating my reactions, biases, and blind spots. Over time, the autoethnographic process prompted a shift in my professional identity. I began to see myself not just as a deliverer of sport science, but as an ethical actor situated within a complex human system.

There are limitations to this approach. The narrative is subjective and cannot claim to represent all concussion cases or practitioner experiences. However, the depth and immediacy of insight it provides offer a valuable counterpoint to more detached research paradigms. In capturing the emotional, ethical, and relational dimensions of concussion management, autoethnography bridges the gap between policy and practice in ways that few other methods can.

CHAPTER SEVEN.

Critical Discussion.

7.1 Synthesis of Findings

This chapter will synthesise the findings of this thesis, integrating and analysing them in relation to the aims and objectives outlined in Chapter One. The findings from each empirical study will be summarised, highlighting key insights into concussion and head injuries in Scottish FCs. A broader discussion will follow, providing a meta-thematic analysis of the key themes identified in each study, addressing each study's limitations, and proposing future directions for further research. Finally, this chapter will evaluate the development of research and professional skills through a meta-reflection, considering the areas identified in the self-audit conducted at the start of the PD programme.

Chapter 7 serves as the pinnacle point of the three empirical studies, offering a meta-thematic analysis that draws together key patterns and tensions. The purpose of this synthesis is to move beyond isolated findings and examine how the interplay of culture, knowledge, structure, and emotion shapes the lived experience of concussion and head injury management in professional football. By triangulating data across survey, interview, and autoethnographic methods, this chapter provides a more holistic understanding of how head injuries are navigated in practice by revealing tensions between policy and behaviour, awareness and action, and care and performance.

Meta-thematic analysis was selected to present the complexity of these issues, enabling the identification of overlapping themes while respecting the unique contributions of each methodological lens. The five resulting themes – knowledge-practice gaps, cultural pressures, education gaps and inequity, role ambiguity and hierarchy, and communication breakdowns are not mutually exclusive but mutually reinforcing. Together, they create a layered portrait of concussion and head injury care that highlights both systemic shortcomings and areas of potential transformation.

This approach builds on the work of Braun and Clarke (2012), who advocate for reflexive thematic synthesis as a way of integrating qualitative insights across diverse data sources. The discussion that follows aims not only to interpret the findings but to explore their real-world implications for practitioners, policymakers, and researchers seeking to improve concussion and head injury safety in football.

7.2 Research Aims and Objectives

As previously mentioned in the thesis, due to unforeseen circumstances within the researcher's professional role, a significant shift in focus and approach was taken during this project. Despite these challenges, it presented an opportunity to re-evaluate the research scope to ensure continued relevance, feasibility, and academic rigour. The overarching aim of this thesis was to allow for the three studies to synthesise concussion and head injury perspectives, highlighting not only what stakeholders know or believe about concussion, but also how these beliefs manifest in practice. This project provides a unique opportunity to understand what it feels like to navigate these experiences from within a Scottish professional football environment. This was achieved through the investigations conducted in the three empirical studies in Chapters 4-6. Each of the three study aims and conclusions is further detailed in relation to the overall objectives of the research project. Figure 7.1 presents an overview of the three studies completed throughout the PD.

The aim of **Chapter 4** was to investigate the knowledge, perceptions, and decision-making of key stakeholders in Scottish professional football regarding concussion and head injuries. The study distributed an online survey to players, coaches, parents, and performance staff (n = 333). It explored three main areas: (1) general knowledge of concussion, (2) recognition of signs and symptoms, and (3) responses to return-to-play scenarios. This methodological approach enabled the study to capture both breadth and relevance in stakeholder understanding and behaviour. The study successfully gathered data revealing patterns in awareness, protocol

confidence, and scenario judgement. The main findings indicated that although general awareness of concussion was reasonably high across the four stakeholder groups, significant gaps remained in identifying less obvious symptoms (e.g., emotional changes, sleep disturbances) and interpreting real-world scenarios. Players and parents demonstrated particular vulnerabilities, including underestimating symptom severity or being unaware of formal return-to-play criteria. Coaches and performance staff fared slightly better but still demonstrated inconsistencies in both knowledge and confidence. Another key finding was the lack of standardised concussion education across roles. Many respondents reported never having received formal training, despite their influential positions in managing head injuries. Together, these results highlight a pressing need for role-specific educational programmes and clearer communication strategies within clubs. This chapter provides a critical foundation for understanding the baseline knowledge and operational gaps that exist across Scottish football, reinforcing the urgency to improve both policy implementation and stakeholder awareness.

The aim of **Chapter 5** was to build on the survey findings by exploring in-depth the lived experiences and organisational practices surrounding concussion and head injury management within a professional Scottish FC. Through semi-structured interviews with players, coaches, parents, and performance staff (n = 17), this qualitative case study revealed complex dynamics in how concussion and head injury protocols are understood, implemented, and negotiated in practice. The main themes to emerge included a shared uncertainty or lack of clarity across stakeholder groups about their specific responsibilities during concussion and head injury incidents. Coaches frequently relied on their experience rather than established guidelines, while parents voiced concern about their limited role and lack of confidence in post-incident decisions. Players often described a performance culture that discouraged injury disclosure, and performance staff highlighted the difficulty of consistently implementing protocols due to role ambiguity and time pressures. Notably, the study uncovered institutional and cultural

factors that influenced concussion and head injury care. A prevailing tension between player welfare and performance expectations often led to premature returns to play or protocol avoidance. Communication between stakeholders was found to be fragmented, contributing to inconsistencies and missed opportunities for effective care. Overall, Chapter 5 deepened the findings from Chapter 4 by demonstrating how knowledge gaps and organisational culture intersect to shape real-world practice. It underscores the need for a system-wide approach that not only delivers education but also fosters a culture that consistently empowers stakeholders to prioritise player health and safety.

The aim of **Chapter 6** was to critically examine the emotional, ethical, and institutional dimensions of concussion and head injury management from a practitioner's perspective. Using an autoethnographic approach, this chapter provides a reflective, insider account of the author's lived experience as an applied sport and exercise scientist within a professional Scottish FC. Drawing on fieldnotes, observational data, and personal reflection, the chapter explores the often-hidden dimensions of concussion and head injury care that occur beyond formal documentation and policy adherence. The main findings that emerged included ethical tension, emotional labour, and the performance of care. The findings illustrated how well-intentioned practitioners can be constrained by hierarchical structures, ambiguous roles, and cultural norms that prioritise competitive success over health protocols. The chapter also revealed how practitioners may struggle to challenge authority or advocate for player welfare in high-performance environments. The emotional toll of managing these conflicts, particularly in the absence of formal support or recognition, adds another layer of complexity to concussion and head injury care. Yet the study also uncovered small acts of resistance in which genuine care and ethical action still surface, even within constrained environments. By offering a first-person account, Chapter 6 contributed a unique dimension to the overall thesis, highlighting the moral complexity of concussion and head injury management and the importance of

critically examining the practitioner's role. This chapter not only complements the earlier studies but also pushes the discussion forward by arguing that effective concussion and head injury care is not solely a technical or procedural issue, but also a deeply relational and ethical one.

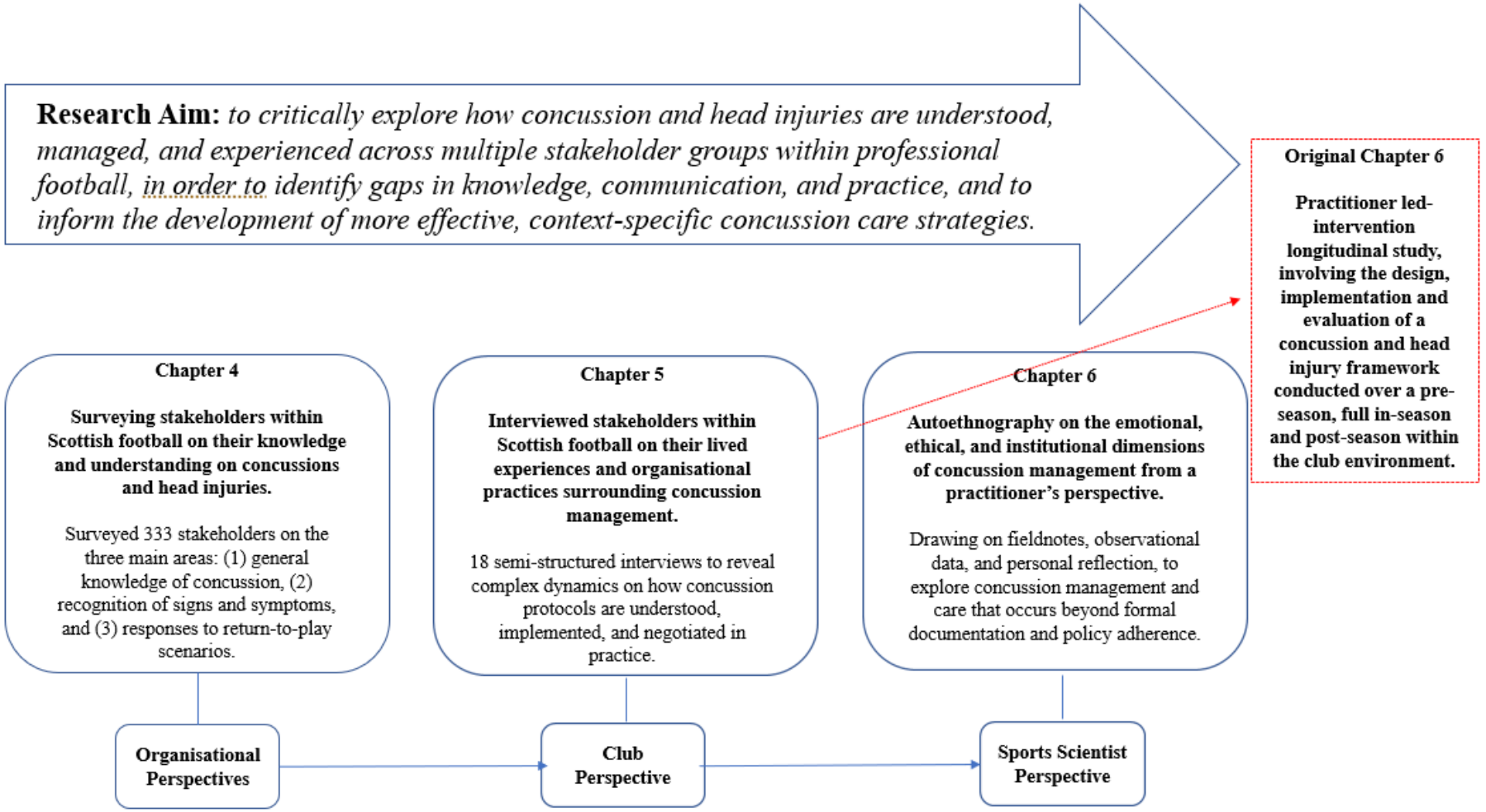


Figure 7.1 presents the overview of the three empirical studies completed during my PD.

7.3 General Discussion

Concussions and head injuries have become a central talking point around health and safety concerns in football. As a high-contact sport, football puts players at substantial risk for head injuries due to frequent high-speed impacts and physical contact. The growing body of research has revealed that concussions in football are not isolated incidents but often part of a broader pattern of repetitive head impacts. These head impacts, while not always resulting in immediate symptoms, can accumulate and contribute to long-term cognitive decline and neurodegenerative diseases (McKee et al., 2013).

Education and awareness of the severity of a concussion and head injury are crucial. Return-to-play typically needs medical clearance, but in some instances, this is overruled or not adhered to, depending on the level of the FC. Medical clearance is vital to prevent second-impact syndrome, which is where a player sustains a further concussion or head injury before fully recovering from the initial injury (Giza & Hovda, 2014).

Concussions can be a difficult injury to diagnose because symptoms may be delayed or downplayed by a player seeking to remain available for team selection. Additionally, cultural attitudes within football often encourage toughness and playing through injury, which can lead to under-reporting (Kroshus et al., 2015). Continued efforts are required to shift this mindset and to prioritise a player's long-term neurological health and wellbeing over short-term performance benefits.

The overarching aim of the thesis was to allow for the three studies to synthesise concussion and head injury perspectives, highlighting not only what stakeholders know or believe about concussion, but also how these beliefs manifest in practice. The studies provided a unique opportunity to understand the challenges the researcher faced in navigating their role in a high-performance, high-pressure environment at a Scottish professional FC. Together, the findings

reflect a significant and persistent lack of knowledge and awareness among all stakeholders, including players, parents, coaches, and performance staff, regarding the severity and potential long-term implications of concussion and head injuries. This widespread knowledge gap underscores the urgent need for governing bodies to increase educational outreach and to implement and enforce standardised protocols across all levels of Scottish football. While some progress has been made, it is evident that current efforts remain inconsistent and insufficient. Comprehensive policy reform, mandatory training programmes, and a cultural shift to prioritise player safety are essential. The governing authorities must take a more proactive and coordinated approach to ensure that concussion and head injury management guidelines are readily available for all stakeholders, are integrated into everyday practice and are strictly adhered to at all clubs. Without such systemic change, the risks associated with concussion and head injuries will continue to be underestimated and improperly addressed.

The next section of work will integrate the results from studies 1 (survey), 2 (interviews), and 3 (autoethnography) to develop a meta-thematic analysis to identify key themes. This triangulated strategy strengthened the validity of findings by providing a multi-perspective lens, as well as highlighting areas of tension between stakeholder perception and practice. These tensions added depth, emphasising the need for context-sensitive policy development and education initiatives in Scottish football settings. The next body of work will be Figure 7.2 to clearly present the key meta-thematic themes.

Meta-Themes	Study 1 Survey	Study 2 Interviews	Study 3 Autoethnography	Relationship Across Studies
Knowledge-Practice Gap	Participants recognised common symptoms but often failed to apply protocols accurately.	Coaches and parents often guessed or relied on gut feelings. Staff were unsure of their exact role.	The researcher could not always follow the rules because of club pressures.	**Complementary**
Cultural Pressures	Not reported in survey responses	Winning was regarded as more important than player safety	Cultural silence and emotional strain when challenging unsafe practices	**Complementary**
Education Gaps & Inequity	Confusion around roles and limited educational workshops, particularly among parents and players	Stakeholders passed responsibility onto others; staff were not given clear authority.	Knowledge experts were not always listened to	**Complementary**
Role Ambiguity & Hierarchy	Limited awareness of formal club protocols and hierarchical decision-making	Communication breakdowns and blurred responsibilities across stakeholder groups	Decisions were mainly made by senior stakeholders, limiting input from others	**Complementary**
Communication Breakdowns	High proportion lacked formal training; inconsistent knowledge-to-action translation	Stakeholders did not communicate clearly resulting in delays and mistakes	Need for practitioner-led initiatives were clear; informal networks often filled knowledge gaps	**Complementary**

Table 7.1 Key meta-themes.

7.4 Study 1 (Chapter 4)

The results from Study 1 present a broad but fragmented picture of concussion knowledge amongst stakeholders in Scottish professional football. The quantitative survey revealed that 85% of respondents reported high awareness of concussion symptoms such as headache, dizziness, and confusion. However, fewer than half recognised less visible symptoms like irritability, sadness, or sleep disruption. Critically, while 90% agreed that concussion should be taken seriously, only 40% correctly identified the return-to-play protocols, and just 28% demonstrated accurate decision-making in scenario-based questions. For example, over half of the parents and players who were surveyed, believed that a player could RTP after "just feeling a bit dazed" if symptoms cleared. Moreover, although 72% of respondents felt their training was sufficient, 56% admitted they had never been formally introduced to their club's concussion policy, and 78% of parents stated they had received no relevant training at all. These figures highlight a perception–reality disconnect: stakeholders report high confidence but show limited understanding when confronted with practical scenarios. This supports research suggesting that awareness alone is insufficient without reinforced, context-specific application (Feiss et al., 2020; Register-Mihalik et al., 2013). The survey findings therefore point to a significant knowledge–practice gap, where theoretical understanding fails to reliably conduct safe behaviours in real-world settings.

7.5 Study 2 (Chapter 5)

The results from Study 2 present a more textured and socially situated view of concussion management practices, as told through the voices of coaches, parents, players, and medical staff at one professional Scottish FC. Through eighteen semi-structured interviews, participants described a culture where informal norms and performance pressures, routinely undermined

official guidance. Several coaches acknowledged knowing "what the rules say," but also admitted to deviating from them in high-pressure situations.

Interviewees also reported confusion over who is ultimately responsible for recognising concussion and initiating return-to-play processes. Parents often assumed it was the coach's role; coaches, in turn, deferred to medical staff, who were not always present at training or away fixtures. These findings highlight a broader theme of role ambiguity and decentralised responsibility, which significantly weakens the system of care.

The interviews further exposed a disconnect between stated values and actual behaviours. While stakeholders consistently articulated that "player safety comes first," many also shared instances where they had ignored symptoms or allowed players to continue under unclear circumstances. Cultural expectations, particularly those linked to masculinity, resilience, and performance, were powerful influences. These findings are consistent with Nixon's (1994) concept of playing through pain, and with more recent research on cultural pressures in high-performance environments (Putukian, 2016; Kroshus et al., 2017). Study 2 also revealed that concussion care is embedded in a contested cultural terrain, where ethical ideals compete with practical realities.

7.6 Study 3 (Chapter 6)

The results from Study 3 present a deeply reflective, emotionally charged exploration of concussion care from the perspective of an insider-practitioner using autoethnography. This captured the emotional labour, ethical dilemmas, and power constraints experienced in trying to implement safe concussion management under organisational and cultural pressure. A recurring matter in the autoethnographic narrative was hierarchical marginalisation. Despite possessing training and institutional authority to raise concerns, the practitioner often found their input side-lined by senior coaching or medical staff. This reveals not only procedural

breakdowns but also power asymmetries that silence the voices of care. Moreover, the practitioner routinely found themselves correcting misconceptions regarding head injuries and concussion amongst coaches as well as offering side-line advice to them on this subject matter. While this advocacy role was fulfilling, it also underscored systemic training inequity and the emotional burden of care when operating without structural support.

7.7 Integrated Insights and Thematic Synthesis

Together, the findings from Studies 1, 2, and 3 demonstrate that concussion management is less a question of knowledge deficiency and more an issue of cultural, emotional, and organisational complexity. Study 1 quantitatively confirmed that knowledge is limited amongst the stakeholders and not always referenced. Study 2 demonstrated how roles, expectations, and informal pressures distort decision-making and Study 3 added emotional depth, exposing the strain placed on individuals navigating the daily demands of club pressures.

Across all three studies, the knowledge–practice gap was evident. Despite high self-reported awareness in Study 1, Study 2 revealed that recognition in real time was poor, and Study 3 highlighted that even experienced practitioners were constrained by club culture and hierarchy. Similarly, knowledge adequacy was overestimated in the survey, as the interviews and observational data revealed minimal formal education and the reliance on intuition or experience. This is consistent with prior research indicating that one-off workshops or passive information-sharing are insufficient without reinforcement and behavioural rehearsal (King et al., 2016; Davis et al., 2018).

The studies also uncovered cultural tensions between care and competition. Stakeholders professed serious concern for concussion and head injuries but routinely prioritised team performance. The autoethnography vividly illustrated how silence and complicity were sometimes the only survivable responses in a system that prioritised continuity over caution.

These insights confirm Kroshus et al.'s (2015) findings that sports medicine professionals often feel pressured to return athletes prematurely due to institutional norms.

Finally, communication and policy enforcement were found to be fragmented across all levels. From Study 1's survey data presenting poor awareness on current rules and regulations, to Study 2's confusion regarding concussion management responsibilities, to Study 3's reliance on informal conversations, as opposed to structured reporting of incidents, there is clear evidence of a systemic failure to establish and maintain consistent concussion and head injury pathways in Scottish football.

7.8 Knowledge-Practice Gap

Lack of knowledge is a persistent theme that spans across all stakeholders – players, parents, coaches, and performance staff all requiring more comprehensive, up-to-date and football specific training and education. Across all three studies there is a widespread gap in knowledge regarding concussion and head injury management. For example, players expressed a desire for more information on the risks associated with concussions and head injuries, recovery protocols, and possible long-term consequences of head injuries. coaches and performance staff also highlighted the need for more specialised, football specific concussion and head injury training beyond the basic first aid training courses. This lack of understanding can lead to inconsistent decision-making regarding concussion and head injury reporting, RTP protocols and recovery management.

The survey findings suggest that concussion and head injury education must go beyond information delivery. There is a requirement for interventions that support stakeholders applying knowledge in real-world pressures. Scenario-based workshops or the use of simulation and role-play, could better prepare coaches, parents, and players to navigate the emotional and ethical complexities of injury situations.

Study 1 – Survey

While the survey (Study 1) revealed that most stakeholders could correctly identify key concussion symptoms, scenario-based responses suggested that this knowledge was not consistently applied in context. This gap between what individuals know and how they act reflects a broader challenge in sport's health education. As previous researchers have found, cognitive awareness does not automatically lead to behavioural change (Kroshus et al., 2016). 'Don't know' was a common response from the online survey confirming the limited knowledge amongst the stakeholders involved. One comment that was added to the end of a survey stated, "Have experienced head injury/suspected concussion but not told medical team as wanted to continue playing". This emphasises the importance of training and educational workshops as a player's short-term decision could lead to long-term complications.

Study 2 – Case Study

In the interviews (Study 2), participants often spoke about "doing what felt right" rather than following formal protocols, particularly in high-pressure situations. This was reinforced in the autoethnographic account (Study 3), where professional judgement frequently reverted to cultural and institutional norms. Whilst most disciplines involved had no official form of training/education, performance staff demonstrated a good awareness of concussion risks, but often relied on self-directed learning and general first aid courses to stay informed. This raises concerns about the consistency and accuracy of the information performance staff members receive. One performance staff member stated, "I read up on things to keep myself up to date", but they also added, "Formal training in concussion management was limited. First aid courses provide a basic understanding, but they do not offer the depth of knowledge necessary for managing concussions in a high-contact sport like football".

Study 3 – Autoethnography

My applied experiences revealed a persistent and concerning lack of applied understanding among key stakeholders. On multiple occasions, I observed coaches misinterpret visible symptoms or fail to recognise the potential seriousness of head impacts. From my autoethnographic account, the following comments were made by the coaching/management team regarding a player who had sustained a concussion during the season – 'He's at it again.", "Always finds a way out.", and "Fancies a few days off, doesn't he?". These encounters highlight more than isolated misunderstandings. Instead, they reveal a systemic knowledge gap where key decision-makers operate without the necessary clinical awareness to safeguard player welfare. These attitudes were not due to negligence or apathy, but rather the absence of continuous, context-specific education and a shared understanding of the nature of the injury**.** It became increasingly evident that protocols, even when known, were often viewed as abstract or optional rather than mandatory.

7.9 Cultural Pressures

Culture plays a critical role in shaping how concussion and head injury risks are perceived and managed. In all three studies, participants described environments where injury was downplayed, toughness was valorised, and returning to play was a badge of honour. These narratives mirror broader sporting ideologies that equate resilience with silence and availability with commitment (Nixon, 1994).

Changing these cultural dynamics requires a shift in language, values, and leadership. Organisational policies must be coupled with visible role modelling from senior staff, including head coaches and directors. A more holistic definition of player wellbeing, one that values long-term health over short-term results, must be embedded into team cultures.

This meta-theme focuses on the broader cultural issues within football that influence how concussions and head injuries are perceived and managed. There is a prevailing culture in

football at all levels that encourages players to play through injury. This resilience and toughness can lead to the under-reporting of concussion and head injuries or early RTP decisions, that could ultimately put players at risk of possible long-term health complications. The conflict between a player's wellbeing and the pressure to push through the pain is a result of a lack of clear rules, regulations, and protocols.

Study 1 – Survey

The survey findings revealed gaps in concussion knowledge and evidence of deep-rooted cultural pressures that shape stakeholder responses to head injuries in football. Although 90% of the survey respondents agreed that concussion should be taken seriously, their responses to scenario-based questions suggested these values were often overridden by performance-driven norms. For example, when presented with a scenario where a player reported "feeling dazed but wanted to continue," over 40% of participants, including players and coaches, indicated they would allow the player to resume play. This suggests that the urgency to compete often supersedes caution, even when concussion symptoms are clearly present. Findings reflect the normalisation of risk-taking behaviour and reinforce prior research that highlighted how competitive sporting environments often celebrate resilience and toughness at the expense of health (Nixon, 1994; Kroshus et al., 2017). The survey underscores that knowledge in isolation is insufficient. Cultural expectations regarding toughness and success directly influence stakeholder behaviours, often at the expense of player safety.

Study 2 – Case Study

Players reported internalising expectations about "playing through pain," while coaches referenced feeling conflicted between protecting players and maintaining competitive edge. The tension between prioritising player welfare and the pressure to RTP quickly is particularly evident when considering the role of coaches. Interviews with players indicate that there is

often a rush to return to training or competition, even when they have not fully recovered from a concussion or head injury. One player shared, "Coaches want you back playing as soon as possible." This aligns with previous research that emphasises the pressures placed on players to perform, even if it means downplaying the severity of their injuries (Roderick, 2006; Waddington & Roderick, 2002). However, coaches in this study indicated that there has been a shift towards a more cautious approach to concussion management, likely influenced by increasing media coverage and awareness surrounding the risks of head injuries (Miele et al., 2020).

Despite this shift in coach's attitudes, players continue to feel significant pressure to RTP as quickly as possible, motivated by the fear of losing their position on the team or missing future career opportunities. One player noted, "I know people who have had head injuries and been out for 3-4 weeks and it still wasn't fully recovered when they returned." This highlights the cultural expectations in football, where players often downplay injuries or rush their recovery and RTP, even at the cost of potential long-term health implications (Elliott et al., 2016).

Study 3 – Autoethnography

The autoethnography revealed that some health professionals are complicit in sustaining harmful norms when their authority is not institutionally supported. The discrepancy between player's and coach's reports reflect the complex and often contradictory pressures within professional football. While coaches may claim to prioritise player welfare, the reality suggests that systemic pressures, including competitive expectations and financial stakes, may lead to a culture of premature returns to play, potentially compromising player safety.

During one of my autoethnographic accounts it was stated that a player took me aside and said, "You see me avoiding headers today?". I asked him if he was okay and he replied, "Not really, still getting dizzy spells. But I can't say anything… or I'm out.". This is another example of a

player being rushed back begore fully recovering, complimenting Study 2 logs from the interviews. These narratives illustrate how organisational culture silently overrides medical caution, creating an environment where rules become performative and care becomes conditional.

7.10 Education Gaps and Inequity

The issue of access to relevant stakeholder concussion or head injury education emerged strongly across all three studies. While some stakeholder groups, particularly performance and medical staff, reported high levels of formal training, others, such as parents and coaches, had received little to no structured education. This inconsistency reflects what can be described as education inequity, where opportunities for knowledge development are distributed unevenly across Scottish football.

These findings align with previous literature indicating that sport injury education is often fragmented and role-dependent (Caron et al., 2018). Without training, stakeholder groups such as coaches and parents, are the most likely groups to witness concussion and head injuries and, yet, they may be the least prepared to manage them.

Addressing this concern requires governing bodies to establish equitable, mandatory education frameworks. This could include tiered training modules tailored by role, and the use of accessible formats (e.g., mobile-based learning, online workshops). By democratising access to concussion and head injury knowledge, the sport can foster more consistent and confident decision-making across all levels of the game.

All three studies underscored substantial educational gaps and training. This pattern is consistent with prior research suggesting that educational interventions are often inconsistently delivered and rarely evaluated for impact (King et al., 2016; Feiss et al., 2020). The absence of refresher training or ongoing professional development further contributes to the decay of

knowledge over time. The data also illustrated that while knowledge may be retained in written or cognitive form, it does not necessarily translate into correct responses during high-pressure or ambiguous situations, highlighting the need for experiential, scenario-based training (Williams et al., 2016).

Study 1 – Survey

The survey data highlighted significant educational gaps across all stakeholder groups, particularly among parents, players, and coaches. While 72% of respondents believed their concussion training was sufficient, closer inspection revealed a concerning lack of exposure to formal education. Specifically, 78% of parents and 52.5% of players reported having received no formal training related to concussion management. Furthermore, over half of all respondents were unable to correctly identify key elements of the return-to-play protocols, despite claiming high general awareness. This discrepancy suggests not only a lack of access to education but also an overconfidence in one's knowledge, likely influenced by social desirability or misunderstandings about what effective training entails. These results align with previous studies showing that one-off educational interventions often fail to produce durable, practical knowledge (Feiss et al., 2020).

Study 2 – Case Study

The interviews in Study 2 revealed that educational gaps in concussion care were not only widespread but also contextually reinforced by organisational shortcomings. Coaches and parents frequently expressed uncertainty about what concussion symptoms to look for, how long recovery should take, or who was responsible for monitoring players post-injury. One coach admitted, *"I know the basics, but when it happens in front of you, it's not clear what to do."* Another parent said, *"We haven't had any real information since he joined the academy, I just go by instinct."* These qualitative accounts expose a clear lack of ongoing and consistent

training, particularly tailored to each stakeholder's role. Coaches described initial induction-level education if they had completed their Sports First Aid award but noted that there were no refreshers, practical simulations, or discussions about evolving protocols. These findings reflect broader concerns in the literature that concussion education tends to be reactive and under-resourced in grassroots and academy-level sport (King et al., 2016; Davis et al., 2018), but from my three empirical studies, I have noticed concussion management and education to be under-resourced, even at the top level of Scottish football.

Study 3 – Autoethnography

The autoethnographic reflections provided a first-hand insight into how educational deficits manifested in day-to-day practice, not just as gaps in stakeholder knowledge, but as emotional and ethical burdens on the performance and medical staff. Over the course of the season, the researcher repeatedly found themselves filling bridging the knowledge gaps by explaining symptoms to parents, and guiding coaches on return-to-play timelines. Following a player's head injury, the practitioner noted that *"I'm constantly teaching on the fly, it feels like I'm the only one who's been trained".* These moments emphasised that when there is a lack of a structured, shared education programme, it creates an uneven playing field, where some stakeholders carry all the knowledge, while others operate on outdated or incomplete information. The absence of a collective understanding also generated frustration and moral strain, particularly when the practitioner's efforts to intervene were ignored or minimised. This aligns with literature on "emotional labour" in caregiving roles (Sparkes, 2020) and reflects how educational inequity can lead to ethical tensions and institutional vulnerability.

7.11 Role Ambiguity and Hierarchy

The three empirical studies revealed significant ambiguity around who has overall responsibility during a suspected concussion event. Participants frequently deferred to

"someone else," often citing uncertainty about their role or a perceived lack of authority to act. While deference to expertise is appropriate in clinical settings, in many football environments, particularly in youth or part-time clubs, medical professionals are not always immediately available, leaving the decision-making process in the hands of coaches, parents, or support staff.

This ambiguity was compounded by hierarchical structures within clubs. In Study 2, several respondents noted that decisions ultimately rested with the head coach, regardless of medical advice. In the autoethnography, the researcher described feeling ethically compelled to intervene, yet institutionally unsupported. These experiences mirror what is described in organisational behaviour literature as role conflict, where individuals receive competing expectations from multiple sources (Kahn et al., 1964).

Role ambiguity can delay or derail timely concussion and head injury actions. When responsibility is unclear, it is often avoided altogether. As a result, players may remain in play longer than is safe, or follow-up care may be neglected. These risks are especially acute in developmental settings, where young athletes are more vulnerable to long-term effects.

This meta-theme highlights the ambiguity and confusion surrounding who is responsible for concussion and head injury management within Scottish football settings. Throughout the studies there were conflicting or unclear views on who was accountable for the safety of a player, particularly with regards to head injury management. Ultimately, it is the responsibility of the medical department to diagnose injuries, to carry out injury management and rehabilitation, and they should also have the final say on whether a player is fit to train or play.

Study 1 – Survey

61% of coaches who answered the online survey said they could recognise a head injury but 74% of them could not determine when a player was fit to RTP. This is interesting, as does not

appear to be the case from the study findings. Instead, it appears that players are hurried back to training by the coaches, often when they are not fully recovered.

Study 2 – Case Study

An interview with a player during the case study supports the point that the medical departments do not always have the final say on the RTP for an injured player. One player commented, *"Coaches want you back playing as soon as possible,"* emphasising the urgency placed on players to return to the team, often before they are fully recovered.

Study 3 – Autoethnography

Based on my applied practitioner work, depending on the club's league position a player's readiness for selection, will be overlooked and decisions will be made by the coaching staff without agreement from the medical team. From my autoethnographic accounts, it was evident that Ben should not have been playing or training, but the management staff overruled this. This emphasises how little control the performance and medical staff have on a player's wellbeing when coaching staff overrule the guidelines, rules, or protocols.

7.12 Communication Breakdowns

Communication emerged as both a barrier and an enabler of effective concussion and head injury management. Across all three studies, breakdowns in communication were cited as a key reason why appropriate action was delayed or overlooked. These breakdowns occurred vertically (between club management and staff), laterally (amongst coaches and support roles), and externally (with parents or other stakeholders).

In the survey, many participants stated they were unsure if their club had a concussion and head injury policy. During the interviews, players and parents described inconsistent updates about

injury seriousness or return-to-play expectations. The autoethnography offered an insider's view of how silence or indirectness, often driven by fear of conflict, undermined transparent decision-making. These findings are consistent with research by Chrisman et al. (2014), who highlighted the importance of multi-directional communication in sport health systems. When information about head injuries is not clearly transmitted, assumptions and informal heuristics tend to fill the void.

The research also highlighted communication breakdowns, which further exacerbate the challenges described above. In Study 1, more than half of players and 78% of parents reported receiving no formal training or education on concussion or head injuries, and many were unaware of their club's policies. Study 2 revealed that communication between coaches, parents, and medical staff was often ad hoc or entirely absent, leading to confusion and mismanagement. These findings echo prior literature noting that multidisciplinary concussion and head injury care often fails due to lack of shared protocols and inter-role communication (Kerr et al., 2014). In Study 3, the practitioner's account emphasised how informal knowledge and reactive conversations, replaced structured debriefs or interdisciplinary planning. Without a cohesive communication infrastructure, even well-designed protocols are rendered ineffective.

Study 1 – Survey

Study 1 revealed several indicators of poor communication structures between stakeholders, particularly regarding concussion protocols and post-injury follow-up. While 90% of participants expressed confidence that concussion is treated seriously within their clubs, only 44% of respondents were aware of their club's official concussion policy, and more than half (56%) said they had never received any direct communication about protocol expectations. This gap was particularly prominent among parents and players, with one player commenting

in an open response: *"I've never actually seen the return-to-play steps written down, we just go with what the coach says."* These findings suggest that despite the presence of policies, there is no consistent or formalised system for communicating them, leaving many stakeholders reliant on assumption or second-hand knowledge. This supports broader literature which has found that the absence of structured communication channels weakens injury surveillance and response systems in sport settings (Kerr et al., 2014; King et al., 2016).

Study 2 – Case Study

In Study 2, communication breakdowns emerged as a central theme shaping inconsistent concussion management. Participants frequently described confusion over who should inform whom, when, and how often after a head injury. A parent explained, *"We usually wait to hear something from the coach, but half the time we don't get told anything".* Coaches similarly expressed uncertainty: *"I just assume the physio will follow up with the parents, unless it seems really serious".* This informal and inconsistent approach to communication often left stakeholders, especially parents, uninformed about potential concussions, return-to-play timelines, or symptom monitoring. Performance staff also noted that, in the absence of structured debriefs or reporting protocols, communication typically occurred on an ad hoc basis. The resulting ambiguity contributed to missed follow-ups, unclear role expectations, and increased risk for re-injury, reinforcing the need for integrated, inter-role communication strategies as highlighted in prior research (Chrisman et al., 2014; Davis et al., 2018).

Study 3 – Autoethnography

Study 3's autoethnographic data offered a first-hand, emotionally grounded account of how communication failures play out in real time. The practitioner repeatedly described being "left out of the loop" despite being directly involved in a player's health. In one field note, after

identifying a possible concussion during a training session, the practitioner wrote: *"I asked if it had been flagged to the head coach, turns out no one had said anything, even though I assumed the physio had".* These oversights were not intentional, but reflected a lack of structured information sharing mechanisms, where vital concussion details were lost or delayed due to assumptions and different roles. The practitioner also recalled instances where they were tasked with symptom monitoring without ever receiving formal documentation: *"I found myself guessing where the player was in their return-to-play timeline because nothing had been recorded".* These reflections emphasise how systemic communication failures rather than individual negligence create conditions for mismanagement, particularly in environments where authority and access to information are unequally distributed (Kroshus et al., 2015; Sparkes, 2020). These complementary findings confirm that a lack of systemised communication amplifies risk, especially in dynamic and multi-disciplinary environments like football.

7.13 Limitations and Future Research

7.13.1 Limitations

While this thesis presented a multi-layered investigation into the knowledge, culture, and practices surrounding concussion and head injury management in Scottish football, it is essential to acknowledge its limitations. Recognising these constraints is critical not only for the integrity of the research, but also for situating its findings within the broader context of sport science and injury management literature. Firstly, the cross-sectional survey employed in Study 1 (Chapter 4), while effective in generating broad insights from a large sample (n = 333), the participation was voluntary and distributed through professional networks and social media platforms, which may have introduced self-selection bias. Stakeholders with a pre-existing interest or concern about concussion and head injuries may have been more inclined to

participate, potentially inflating levels of knowledge or concern in the overall sample. Additionally, while the survey was able to measure general awareness and scenario-based decision-making, its predominantly closed-question format restricted deeper exploration of attitudes, reasoning, and personal experiences. As a result, important findings or contradictions in stakeholder perspectives may have been under-represented. However, closed-questions were there to force participants to make a choice on their answers.

In Study 2 (Chapter 5), the qualitative case study design enabled in-depth exploration of stakeholder experiences within a single Scottish professional FC. This context-specific approach was a deliberate methodological choice to prioritise depth over breadth. However, this also meant that the findings may not be fully generalisable to other FCs, levels of the game (e.g., grassroots, amateur, or elite professional), or different national football systems. Club-specific factors, such as internal leadership, culture, resource availability, or previous concussion and head injury incidents, may have significantly influenced participant responses. Furthermore, the sample size, although appropriate for qualitative enquiry, was limited in its representation of certain roles particularly match officials and medical doctors whose perspectives would have enriched the understanding of protocol implementation and decision-making hierarchies.

A further limitation lies in Study 3 (Chapter 6), where a planned longitudinal intervention was replaced by an autoethnographic account due to unforeseen changes in the researcher's employment status following club relegation. While this methodological pivot provided a rich, emotionally and ethically grounded insider perspective, the use of autoethnography introduces questions of subjectivity, generalisability, and representativeness. The insights drawn from this approach are necessarily personal and situated, reflecting the unique experiences of the researcher rather than a broader stakeholder group. The autoethnography offered a valuable

lens into the informal, unspoken, and emotionally charged aspects of concussion and head injury care that are often inaccessible through surveys or interviews.

Researcher positionality also deserves a mention as both a strength and limitation. The embedded nature of the practitioner-researcher role provided privileged access to real-time decision-making processes, behind-the-scenes dynamics, and interpersonal conversations that would not typically be available to external researchers. However, this insider status also presented challenges in terms of role conflict, emotional entanglement, and analytic bias. Balancing professional loyalty with academic objectivity required critical distance. Steps were taken to manage this including supervision, journaling, and iterative data review but the interpretive nature of the work still reflects the situated, personal lens through which it was conducted.

Finally, this thesis did not explicitly account for intersectional variables such as gender, socio-economic background, or playing level (e.g., academy vs. senior squad). Given that concussion and head injury experiences, symptom reporting, and cultural norms may vary across these dimensions, future studies would benefit from a more intersectional analysis. Moreover, the absence of longitudinal data means that this research captures a snapshot in time rather than tracking changes in knowledge, behaviour, or policy uptake over time.

7.13.2 Future Research

The findings of this thesis highlight several important avenues for future research, both to deepen the understanding of concussion and head injury management in football and to inform more effective, context-sensitive interventions. Firstly, broader studies are required to examine how concussion knowledge, attitudes, and practices differ across FCs at different levels (e.g., grassroots, semi-professional, elite). Comparative studies across clubs with varying resources,

support structures, and cultural norms would allow researchers to assess the extent to which the issues identified in this thesis such as role ambiguity, fragmented communication, and protocol avoidance are widespread or context-dependent. These studies should aim to include medical professionals, referees, administrators, and governing body representatives, whose perspectives were either limited or absent from the present research.

A second key recommendation is the development and evaluation of targeted, stakeholder-specific educational interventions. There are few concussion education programmes tailored to the specific stakeholders within football environments. Future research should design training materials with input from players, coaches, parents, and performance staff to ensure relevance and uptake. In parallel, future studies could adopt longitudinal or pre/post designs to assess how stakeholder knowledge, attitudes, and decision-making change over time, particularly in response to training, policy changes, or lived experiences with concussion incidents.

Furthermore, future research should explore the implementation of a longitudinal, club-embedded concussion education programme within an SFA academy. This type of sustained, season-long educational approach would enable researchers to examine how knowledge, behaviours, and reporting practices develop over time within a real club environment. Importantly, this was the original planned intervention, but due to unexpected changes it could not be carried out. As such, future work should revisit this initial aim.

In addition to this, there is a need for future research to examine the role of referees in concussion and head injury management. Referees are often the first neutral party to observe a potential concussion or head injury and the only individual empowered to stop the game. This makes them a critical, yet currently under-researched group. A future study focusing specifically on referees examining their education, decision-making, pressures, and interactions would provide a valuable follow-on from the current thesis.

Finally, the use of practitioner-led, reflexive methodologies such as autoethnography or collaborative action research hold considerable promise for advancing the field. Future research could focus on mapping the "hidden curriculum" of concussion and head injury management and pressures that shape practice within a high-performance football setting.

7.14 Novel Contributions

In evaluating the full scope of this doctoral research, it is essential to articulate the novel contributions it makes to the field of sport and exercise science, and more broadly, to concussion research within football. While much existing research on concussion and head injuries have prioritised clinical outcomes, neuropsychological testing, or return-to-play protocols, this thesis purposefully shifts attention to the cultural, organisational, and experiential factors that shape how concussion is understood and managed in professional football. By adopting a qualitatively dominant mixed-methods design, grounded in real-world practice and informed by a critical-practitioner perspective, this research advances the conversation around concussion and head injuries beyond individual knowledge or medical compliance. The following five contributions represent distinct and original elements of the work and offer timely insights for academics, practitioners, and policy-makers concerned with player health and institutional care.

1. One of the central contributions of this thesis is that it moved away from a narrow focus on individual concussion knowledge towards a broader, more nuanced understanding of the cultural and organisational groups that influence concussion care. While knowledge deficits remain important, this research revealed that many of the challenges in concussion and head injury management stem not from ignorance alone but from the complex interplay of cultural norms, institutional pressures, and unspoken expectations within clubs. For example, findings from both the case study and the autoethnography demonstrate how

performance demands, hierarchical structures, and role ambiguity often override best-practice guidelines, leading to fragmented care or protocol avoidance. By reframing concussion as a systemic and relational issue, rather than simply a cognitive or educational one, the thesis challenges dominant discourses and invites more context-sensitive, organisationally aware solutions.

2. Through the integration of findings across the three empirical studies, this thesis introduces a novel conceptual framework composed of five interrelated meta-themes: knowledge-practice gaps, cultural pressures, education gaps and inequity, role ambiguity and hierarchy, and communication breakdowns. These meta-themes were developed through rigorous synthesis and comparative analysis, highlighting both the shared and divergent experiences across stakeholder groups and methodological strands. This framework provides a valuable tool for both researchers and practitioners, offering a structured lens through which to understand the barriers to effective concussion and head injury care in a football setting. Importantly, it allows for intervention planning that addresses not just individual awareness, but the broader systems and cultures in which concussion and head injury related decisions are made. This framework serves as a starting point for future research for those interested in exploring concussion through an interdisciplinary and practitioner-led lens. A resource they can use to identify gaps, frame new questions, or replicate elements of the study in different contexts. In this way, the endpoint of this doctoral research becomes a foundation for continued research and applied exploration into the complex realities of concussion and head injuries in football.
3. Another significant contribution is the inclusion and prioritisation of perspectives from non-medical stakeholder groups. These voices are often absent or marginalised in mainstream concussion and head injury research, which typically centres around medical professionals or elite athletes. By giving equal weight to these groups who play crucial

roles in both formal and informal care processes, this thesis creates a more democratic and practice-informed body of knowledge. Moreover, by highlighting the lived realities of stakeholders who often operate without access to detailed medical guidance, it exposes gaps in communication, policy dissemination, and shared responsibility. This multi-perspective approach underscores the need for inclusive concussion and head injury strategies that account for the knowledge, constraints, and agency of all those involved in the football ecosystem.

4. The inclusion of autoethnography in this thesis provided a rare and valuable first-person account of concussion and head injury management as it occurred behind the scenes in elite sport. This method enabled the exploration of ethical tensions, emotional labour, and identity struggles faced by practitioners who must navigate conflicting priorities, caring for player's health while embedded in performance-driven environments. These accounts challenge the assumption that concussion and head injury care is governed solely by formal policy, instead showing how unofficial practices, institutional silence, and relational dynamics often shape what is done (or not done) in response to concussion and head injuries. The autoethnographic narrative offered an authentic and deeply contextualised contribution to concussion and head injury literature, illustrating how care work is experienced from the inside and how professional roles are negotiated in ethically complex spaces. This is especially pertinent in sport science, where the boundaries between performance and welfare are often blurred.
5. Finally, this thesis addressed a critical gap in the literature by offering detailed, context-specific insights into concussion and head injury management within Scottish professional football. While much existing research is drawn from North American or international contexts with different regulatory frameworks, this study grounds its findings in the unique cultural, institutional, and geographical realities of Scottish football. It evaluates how

national guidance (such as SFA protocols) are interpreted and enacted at the club level, often revealing inconsistencies or gaps in translation. In addition, it identified methodological and geographical blind spots in prior research, particularly regarding smaller clubs and practitioner roles outside formal medical teams. By using a mixed-methods design and drawing on insider access, the thesis brought forward new evidence to inform SFA policy refinement, practitioner training, and grassroots implementation strategies making a tangible contribution to the improvement of concussion and head injury care within the Scottish football context.

7.15 Overarching Conclusion

The overarching findings of this thesis demonstrate a clear and persistent tension between what stakeholders know about concussion and head injuries and how this knowledge is applied in practice within Scottish professional football. Across all three empirical studies (survey data, qualitative case study insights, and an autoethnographic reflection) stakeholders broadly recognised concussion as a serious health concern, were able to identify common symptoms, and expressed an awareness of the risks associated with premature return-to-play. Yet this cognitive understanding did not translate into consistent behaviours, nor did it reliably inform decision-making in real-world contexts. Instead, knowledge was frequently overridden by cultural norms, organisational pressures, and structural barriers that shape everyday practice in football environments.

This body of work demonstrates that improving outcomes in Scottish professional football requires more than refining protocols or disseminating educational materials. It requires a broader cultural shift, where player welfare is prioritised, open communication is supported, and acknowledges that each stakeholder involved has a meaningful role in concussion management. Effective change will depend on strengthening interdisciplinary collaboration,

creating psychologically safe environments for reporting and decision-making, and embedding concussion education within club structures rather than relying on ad hoc or individual-led initiatives. Ultimately, this thesis argues for a holistic and relational approach to concussion car, recognising that knowledge, practice, and culture must align to meaningfully protect players' short-term safety and long-term health.

7.16 Meta-Reflection

My PD journey has been a great personal achievement. Over the past 4 years I have faced many challenges along the way, both professionally and personally, which have been documented throughout the thesis as some of these challenges have ultimately shaped my project. The study of concussion and head injuries in football has broadened my knowledge and understanding on the subject and the experience has provided a detailed insight to the realities of professional life. This research project has altered the way I view football, player wellbeing, multidisciplinary collaboration, and my own role within a high-performance environment. I will reflect on this in the following subsections.

7.16.1 Research Skills

When I first embarked on this journey, concussion and head injury research was typically the domain of medical and physiotherapy departments, and rarely explored through the lens of sport science. As a sport scientist actively working within football, this presented both a professional gap and a unique opportunity. I entered this research with curiosity but also vulnerability, aware of how little I truly understood about concussion and head injury management despite being immersed in the sport on a daily basis.

Through my initial self-audit, I identified that my understanding of concussion and head injury protocols, clinical frameworks, and stakeholder responsibilities was underdeveloped. Whilst I

could speak fluently about physical performance and athlete development, I lacked the knowledge required to meaningfully engage with concussion and head injuries as a critical welfare issue. What has unfolded over the past four years, however, has been a significant transformation, not just in technical knowledge, but in how I think, reflect, and approach complex issues as a researcher. I now possess a deeper and more holistic understanding of concussion and head injuries, not only in its clinical manifestation but also in how it is shaped by culture, communication, hierarchy, and emotion. What continues to surprise me is the contradiction between the heightened media focus on concussion and head injuries and the knowledge gaps in stakeholder understanding and implementation. This disconnect has underscored the need for more applied, practitioner-informed research, the kind that speaks directly to those operating within football.

Over the past four years, the depth and breadth of knowledge I have gained in this area has been significant. I now have a more comprehensive understanding of both the clinical aspects of concussion and the wider cultural, organisational, and ethical challenges associated with it in football. That said, I am acutely aware that there is still much more to learn. The evolving nature of the subject matter, coupled with ongoing advances in research, policy, and practice, means that continued professional development will remain essential.

What has surprised me most during this journey is the contrast between the growing public awareness of concussion and head injuries in football and the gaps in applied research and stakeholder knowledge. The popularity of Scottish football, combined with increasing media attention on brain health in sport, might suggest that the topic is well understood and managed. Yet, my work has revealed significant inconsistencies, misinformation, and under-explored areas, particularly at the intersection of practice, policy, and lived experiences. This realisation

has reinforced the importance of interdisciplinary and practitioner-led research in contributing to meaningful change to safeguard player's welfare.

Throughout the course of this doctoral research project, my research skills have developed significantly, not only in technical competence but also in critical thinking, methodological flexibility, and ethical awareness. Undertaking a multi-method investigation into concussion and head injury management across different stakeholder groups has required me to engage with a broad range of research tools, frameworks, and challenges. Reflecting on this process, I have become more confident in my ability to design, conduct, and critically evaluate applied research within a football environment.

One of the most important personal developments has been my ability to work across methodological paradigm**s**. I had never undertaken any qualitative research before, nor distributed surveys, conducted interviews or completed an autoethnography. These undertakings enabled me to enhance, expand and refine my skill sets by learning new research methods.

Study 1 involved the design and distribution of a cross-sectional online questionnaire. This allowed me to develop skills in questionnaire design piloting, distribution logistics, and statistical analysis. The process taught me to anticipate how people interpret survey items and to consider not just what I wanted to measure, but how the data could inform real-world decisions. Moving into Study 2, this brought me into the world of qualitative interviewing. I developed my skills in constructing open, non-leading interview questions, building rapport with participants, and conducting interviews that were both structured and adaptive. I came to appreciate the richness and unpredictability of narrative data, and how people's words often revealed tensions that a survey alone could never capture. The most significant shift in my research skills came during Study 3, where I had to adapt and embrace a reflexive,

autoethnographic approach as a result of unexpected changes in my career. This amended study then formed the main body of my project. Writing about my own experiences required me to confront my assumptions about objectivity, authority, and the role of the researcher. This phase of the project demanded a high degree of self-discipline and honesty, as well as rigorous attention to narrative structure, theoretical framing, and emotion. It also required me to manage the dual demands of being both practitioner and researcher, a balancing act that required ongoing ethical reflection and positional awareness.

I learned valuable lessons about project management and research adaptability. Navigating practical challenges such as career change, and participant availability taught me to remain positive and flexible, whilst maintaining ethical and methodological integrity. I became more resourceful in adapting study designs and timelines, and more proactive in communicating with stakeholders. These skills are vital for research and are also transferable to my professional practice where unpredictability and change are constant.

In summary, this doctoral journey has expanded my identity from that of an applied practitioner to that of a reflective, critically engaged researcher. I have developed a versatile and ethically grounded set of research skills that will continue to inform my work across sport, health, and education. More importantly, I now regard research not just as a means of generating data, but as a method for challenging assumptions, improving practice, and advocating for player wellbeing.

7.16.2 Professional Skills

Over the course of this doctoral journey, my professional skills have developed significantly. Conducting applied research alongside my role in professional football has not only expanded my technical capabilities but also transformed the way I operate as a practitioner.

Throughout this project, I have undertaken demanding leadership responsibilities to help manage a complex research process, as well as helping to influence and reshape the culture and practices within my professional environment. Engaging stakeholders across different levels of football including players, coaches, parents, referees, and performance staff required me to lead conversations about sensitive and sometimes misunderstood issues. These discussions often challenged established norms around injury, performance, and welfare. I developed a more confident, diplomatic approach to leadership, learning how to advocate for player safety in environments that often prioritise results.

One of the most profound areas of growth has been my ability to communicate across diverse professional groups. Working with multiple stakeholders, each with their own language, priorities, and understanding of concussion, forced me to adapt my communication style and tailor messages to different audiences. Whether designing a survey, conducting interviews with senior members of staff, or translating research findings into actionable insights, these experiences have all enhanced my active listening skills and my sensitivity to power dynamics in professional dialogue. I now place greater value on inclusive, two-way communication that fosters understanding and collaboration, particularly when dealing with complex, emotionally charged topics such as injury and care.

The ethical challenges I encountered during this project were more substantial than I had anticipated. As a practitioner-researcher embedded in a professional football setting, I often found myself balancing competing duties to players, staff, club outcomes, and to research integrity. With PD supervision, reflexive writing, and critical engagement with ethical theory, I developed a more grounded sense of professional responsibility. This has strengthened my confidence in dealing with future ethical challenges in both research and practice.

Perhaps the most transformative aspect of this journey has been the evolution of my professional identity. Prior to this doctorate, I viewed myself primarily as an applied sport scientist, focused on performance support, data analysis, and physical preparation. Navigating through this project, I began to view myself as an advocate for player wellbeing, a collaborator across disciplines, and a critical thinker, capable of influencing organisational change. Exploring the topic of concussion and head injuries, an issue that sits at the intersection of sport, medicine, ethics, and policy, forced me to expand my perspective on what my role could and should involve in football. This shift prompted me to redefine what it means to be an effective practitioner in high-performance sport.

Conducting insider research within a FC also enhanced my organisational awareness. I gained insight into the informal structures, politics, and unwritten rules that shape how decisions are made and how change is enacted. This insight made me more tactically aware of when and how to introduce new ideas, how to position evidence within institutional narratives, and how to build coalitions of support around initiatives related to injury prevention and player welfare.

Throughout this thesis, I have explored the unseen challenges that exist within Scottish football, the ethical dilemmas, cultural pressures and blurred responsibilities. However, what I did not anticipate was the gender bias that would exist in today's society for women to be accepted in men's professional football in Scotland. One of my aims at the outset of commencing my PD was to secure full time employment as a sport scientist in football. Despite years of academic study, years of practical experience, and proven dedication, I have struggled to secure permanent full-time employment in the sport science industry. Roles I applied for disappeared without explanation. In some cases, I was overlooked in favour of less experienced candidates, and in my last role, I was replaced with a colleague's personal connection. None of these scenarios confirm that gender was behind any of the decisions, but when you are told by an

SPFL manager *"I shouldn't be saying this, but you're going to struggle to get a job in football because you're a female",* it helped explain the rationale behind some of these decisions. I do not believe this football manager's comment was ill-intended. I believe he was simply being honest and confirming the bias that exists today in Scottish football and that my gender was a barrier to gaining employment. Maybe his casual tone when making the comment was simply reiterating that's the way things are. Either way, it is wrong that I am not viewed as a sport scientist. Instead, I am viewed primarily as a woman and the rules of the game are different for me.

Through this doctoral research, particularly the autoethnographic work, I have come to understand that my struggle in gaining employment is not a personal failing. It is part of a broader pattern of systemic gender bias within Scottish football and perhaps explains why no female that I have attended University with, has progressed their career in sport.

What this process has gifted me is a clear definition of what success means to me. I no longer feel confined to traditional career pathways in elite sport, where opportunities often feel dependent on politics or connections. My path is widening. I am interested in research that drives policy. I am passionate about education that prepares practitioners for the realities, not just the theories of sport. I want to work in areas where care is as valued as performance and where I am valued and respected as an individual. Conducting this research has challenged me intellectually and forced me to confront deeply personal and systemic challenges in my professional life. While exploring the barriers players face around concussion, I was simultaneously navigating a system that presented its own barriers to me as a woman, as a practitioner, and as a person.

This doctoral journey has strengthened and redefined my professional skillset. I have become a more confident and reflective practitioner with a clearer sense of my values and my influence

within the football. I now approach my work not just as a sport scientist, but as someone capable of navigating complex situations, leading with integrity, and contributing to environments that prioritise both performance and player wellbeing.

As I approach the end of my PD thesis, I find myself at a pivotal moment in my career. Having recently been made redundant from my role within an SFA club where I invested deeply, both professionally and personally, I have been prompted to review my long-term career. While I remain passionate about football, this experience has highlighted the volatility, limited job security and gender bias. I am now at a more reflective stage of my professional life and considering a transition into a role beyond football, one that offers greater stability while still aligning with my core values and expertise in sport, health, and physical activity. Importantly, I recognise that the skills, experience, and knowledge I have developed during my career and completion of this PD are highly transferable and can be applied in a wide range of sectors. I am a positive and optimistic person and do not view this moment as a setback. Instead, I view it as an opportunity to redefine what professional fulfilment looks like for me.

As I conclude my PD, I am aware that it marks both a conclusion and a beginning. This journey has changed me, not just as a researcher or practitioner, but as a person. I have learned that conducting meaningful work in sport is not just about applying knowledge; it is about navigating relationships, values, emotion, and culture. I have faced ethical challenges, moments of self-doubt, barriers, and personal challenges. Nonetheless, I have grown in confidence, improved my skills as an applied sport scientist, and improved my ability as a researcher. What's next for me is the burning question. Whether it is continuing to pursue a new sport scientist role in football, moving into the academic field, or moving away from sport altogether, that is the question. This PD journey has laid the foundations for the future. My career starts now.

CHAPTER EIGHT.

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CHAPTER NINE.

APPENDICES.

9.1 Appendix 1 – Training Plan

A detailed research plan was devised to identify internal and external factors. The training plan consisted of 3 sections – a professional self-audit, a literature review, and a brief methodology of proposed research ideas as well as a Gantt chart which established a realistic time frame for completion of each section of work.

9.1.1 Chapter 1: Self-Audit

During the initial stages of my PD, I was required to complete a self-audit of my professional skills to identify areas which required improvement. These areas included (1) improve career prospects (2) keep up to date with research papers and (3) improve my confidence. These areas of weakness will be improved by (1) building networks and securing full-time employment, (2) setting aside time on a weekly basis to keep up to date with current literature and (3) to trust and believe in my own abilities, exposure to public speaking and presenting to a variety of different audiences.

The Vitae Researcher Development Framework (RDF) (Vitae, 2011) was explained during the first cohort development day to support the professional development of researchers by providing applied and theoretical skills which can be used to assess myself and I will use this baseline to reflect upon my strengths and weaknesses. There are four domains which look at

(1) knowledge and intellectual abilities, (2) personal effectiveness, (3) research governance and organisations and (4) engagement, influence, and impact.

Domain 1: Knowledge and Intellectual Abilities

Knowledge Base (A1)	**1**	**2**	**3**	**4**	**5**
Subject Knowledge					

Research Methods – Theoretical Knowledge					
Research Methods – Practical Application					
Information Seeking					
Information Literacy & Management					
Languages					
Academical Literacy & Numeracy					
Cognitive Abilities (A2)	**1**	**2**	**3**	**4**	**5**
Analysing					
Synthesising					
Critical Thinking					
Evaluating					
Problem Solving					
Creativity (A3)	**1**	**2**	**3**	**4**	**5**
Inquiring Mind					
Intellectual Insight					
Innovation					
Argument Construction					
Intellectual Risk					

Table 9.1. RDF section A – Knowledge and Intellectual Abilities planner. Scored 1 – 5 (1 being novice and 5 being expert).

I have graded subject knowledge as a 2 due to my current level of expertise lying within Sport Science/Strength and Conditioning. My initial project was to further investigate over-training within an elite Scottish football Academy. Had I pursued this project, my subject knowledge would have been graded higher and I would have felt more confident in myself and my abilities. However, following my recent change of Club, I have changed my topic of research and have decided to challenge and push myself outside of my comfort zone and to explore a new area of research. I will strive to develop and enhance my knowledge around head injuries to constantly grade myself higher when I reflect on these gradings at a later stage. I aim to improve my knowledge and understanding by setting time aside each week to keep up to date with current literature as well as expanding my network of contacts.

Domain 2: Personal Effectiveness

Personal Qualities (A1)	**1**	**2**	**3**	**4**	**5**
Enthusiasm					
Perseverance					
Integrity					
Self-Confidence					
Self-Reflection					
Responsibility					
Self-Management (B2)	**1**	**2**	**3**	**4**	**5**
Preparation & Prioritisation					

Commitment to Research					
Time Management					
Responsiveness to Change					
Work-Life Balance					
Professional & Career Development (B3)	**1**	**2**	**3**	**4**	**5**
Career Management					
Continuing Professional Development					
Responsiveness to Opportunities					
Networking					
Reputation & Esteem					

Table 9.2. RDF section B Personal Effectiveness planner. Scored 1 – 5 (1 being novice and 5 being expert).

I am a very enthusiastic and hardworking practitioner and researcher who strives to achieve the best in everything I undertake. However, I still lack self-confidence which is reflected in my low grading in figure 4. I have excellent time management skills and I am an extremely well organised individual. This will accommodate a balance of my fast-paced working environment and the demands of my PD, especially as my academic demands increase. However, one area of struggle is my career management, but through the completion of this PD and exposure to new network of contacts, I am confident in securing a full-time role within my chosen career path.

Domain 3. Research Governance and Organisation

Professional Conduct (C1)	**1**	**2**	**3**	**4**	**5**
Health & Safety					
Ethics, Principles & Sustainability					
Legal Requirements					
IPR & Copyright					
Respect & Confidentiality					
Attribution & Co-authorship					
Appropriate Practice					
Research Management (C2)	**1**	**2**	**3**	**4**	**5**
Research Strategy					
Project Planning & Delivery					

Risk Management					
Finance, Funding & Resources (C3)	**1**	**2**	**3**	**4**	**5**
Income & Funding Generation					
Financial Management					
Infrastructure & Resources					

Figure 9.3. RDF section C – Research Governance and Organisation. Scored 1 – 5 (1 being novice and 5 being expert).

I have the skills and ability to conduct and deliver projects, but this RDF section is where I feel least confident. I do have experience and a basic understanding of health and safety, respect and confidentiality, and appropriate practice. However, I have a limited understanding of ethical procedures, legal rights, copyright, funding, and budgets and these are all areas where I will improve and develop as a researcher and practitioner. I have recently completed the LJMU online ethics training course (see Appendices 1) as well as attending any workshops relevant to key areas that need improving. From this, I will improve these gradings as my development progresses.

Working with Others (D1)	**1**	**2**	**3**	**4**	**5**
Collegiality					
Team Working					
People Management					
Supervision					
Mentoring					
Influencing & Leadership					

Collaboration					
Equality & Diversity					
Communication & Dissemination (D2)	**1**	**2**	**3**	**4**	**5**
Communications Methods					
Communications Media					
Publication					
Engagement & Impact (D3)	**1**	**2**	**3**	**4**	**5**
Teaching					
Public Engagement					
Enterprise					
Policy					
Society & Culture					
Global Citizenship					

Figure 9.4. RDF section D – Engagement, Influence, and Impact planner. Scored 1 – 5 (1 being novice and 5 being expert).

The final domain where I feel confident is working as part of a multi-disciplinary team as I do this as part of my current role, as well as supervising and mentoring new interns within the clubs where I have previously worked. However, there is always room for further improvements, and I believe my PD journey will enable me to develop this area further by being able to present and teach to other University cohorts. These exciting opportunities will also enhance my CV and professional development. The British Association of Sport and Exercise Sciences (BASES) has a High-Performance Sport Accreditation (HPSA), which was devised for professional practitioners who have proven success whilst working with elite

athletes (BASES, 2021). I have used their assessment process as another method for addressing my strengths and weaknesses.

High-Performance Sport Accreditation (HPSA)					
Professional Competencies	**1**	**2**	**3**	**4**	**5**
Practical Experience					
Knowledge and Scientific Training					
Commitment					
Programme and Integration with Coaching Structures and Processes					
Communication Skills					
Professional Relationships					
Teamwork					
Environments					
Problem Solving and Interdisciplinary					
Continuing Professional Development					

Table 9.5. BASES – self-reflection. High-Performance Sport Accreditation professional competencies. Scored 1 – 5 (1 being novice and 5 being expert).

Reflecting on the HPSA in figure 7, I have over seven years of applied experience from working at a variety of clubs at various levels. This has enabled me to gain valuable practical experience i.e., how to conduct appropriate warm-ups, activation, recovery, match day preparation, on-field and gym-based strength and conditioning sessions and to ability and skills to develop and carry out individualised or team training programmes. I am highly committed and extremely motivated to achieve success for both teams and individuals as well as myself.

Whilst on my PD journey, I will develop a high level of research skills which I will apply within my professional work setting. In time, I am confident these gradings that I have scored in Figure 7 will increase because of my dedication and hard work as a researcher and practitioner.

My biggest challenge whilst being part of the PD cohort will be increasing my self-confidence. It is something I am acutely aware of and it is something I have been addressing for some time but with the opportunity to present my work and career journey to date, as well as continuing to push myself, I know that I will successfully secure full-time employment in elite football and will progress from strength to strength as a confident practitioner. Another challenge is the fact that this is a totally new area of study for me. However, if I continue to keep up to date with current literature, continually ask questions and attend appropriate workshops I will successfully rise to the challenge of my PD. Finally, my PD research will be a result of my professional practice supported by current literature. Managing my working environments alongside a full-time PD will present high demands, but by ensuring I remain organised and focussed I will be able to cope with the increased academic demands.

9.1.2 Chapter 2: Research Proposal

The aim of this body of research is to gain an understanding of perceptions of head injuries from a variety of stakeholders at a single SFA club and then develop an appropriate intervention strategy to minimise head injuries. Driven by a pragmatic, data informed approach, this project will attempt to develop a head injury management framework specifically for a single SFA club. Due to the methodological choices proposed in this body of work and the data driven nature of the project, it is feasible this study could change direction depending on the results from the proposed research studies.

Football is a unique sport as it is the only sport where players actively use their unprotected head to purposely control and play the ball down the field or to score a goal (Spiotta, 2012). During a football match an average player can header the ball 6-12 times, where the ball can reach high speeds (Spiotta, 2012). However, during training sessions, headers are less common and when they do occur, they are at much lower speeds (Rodrigues, Lasmar & Caramelli., 2016). Heading a ball involves repeated impact, acceleration–deceleration of the brain, and possibly rotation of the brain. The effects of a repetitive minor injury may not manifest for many years, as is the case in chronic traumatic encephalopathy. Therefore, pathological evidence of traumatic brain injury, is likely to present prior to the onset of symptoms or disability.

There is currently no literature available within Scottish football to suggest how much sport science/strength and conditioning training is involved in minimising and preventing heading injuries. This is a worrying situation considering the rapid growth in interest surrounding this phenomenon. However, some research suggests there is evidence to reduce head injuries. For example, to counter external forces to the head during impact, players must prepare for impact by bracing the neck musculature in properly execute the technique by moving the entire body in one motion (Janda & Cheney, 2002).

Current research is inconsistent regarding the effects of immediate and long-term heading exposures and whether it can lead to any complications later in the player's life (Rutherford, Stewart, & Bruno, 2019). Possible complications of heading the ball will depend on the rate of exposures, the time between exposures and the vulnerability of each player (Lipton et al., 2013).

There is limited literature monitoring the potential long-term consequences on head injuries (Rodrigues, Lasmar, & Caramelli, 2016), especially within the youth development setting as their brains are still developing (Harriss, Johnson, Walton & Dickey, 2018). As a result of these

uncertainties, rules and regulations have now been implemented to minimise the number of headers in youth players aged 14 and below (e.g., UEFA 2020) with the SFA having set their own rules for ages 12 and below. A recent study investigated whether heading should be banned in children's football (Tarnutzer, 2017) because of potential long-term complications emerging. However, due to insufficient evidence to support the ban, a strategy has been introduced instead for heading training. Based on this current literature, further investigation is required into appropriate head injury management frameworks to minimise any immediate and potential long-term complications.

Head Injuries

Head injuries occur in many sports including football (Metzl & Micheli, 1998) and account for 15% of football injuries resulting in hospital emergency department admissions. Most head injuries in young players are aged 10–14 years (50%) and the lowest proportion is for 15–19year-olds (23%) (Giannotti, Al-Sahab, McFaull, & Tamim, 2010). Although football is not traditionally known as high-risk for head injuries, football players are prone to traumatic brain injuries and up to 22% of all football related injuries are head injuries (Covassin, Swanik, & Sachs, 2003). Current head injury literature creates misunderstandings around rules and regulations for coaches, parents, and players.

There are several warning signs and symptoms associated with head trauma i.e., headaches, dizziness, sickness, blurred vision, memory/balance disturbances or loss of consciousness (McCrory et al., 2013) but evidence would suggest that practitioners i.e., coaches/assistant coaches are not aware of all of these symptoms or how they should be managed (Rieger et al., 2018). Head injuries can occur at any age, but young children aged under fourteen are more susceptible, can take longer to recover and are more at risk of long-term neurological complications (Harriss, Johnson, Walton & Dickey, 2018). This is because their brain is still

developing. However, research suggests brain development does not end until the age of twenty-five (Pujol et al., 1993).

As stated previously, to reduce head injuries, heading the ball can no longer be taught to young players under the age of 12 in Scottish youth football. According to UEFA, head injuries can be minimised by (1) ensuring the ball size and weight are appropriate for the age group, (2) the ball pressure must be at the lowest authorised level, (3) reduce the number of heading drills, (4) neck strengthening should be a vital part of training to minimise head injuries and (5) to be aware of all the signs and symptoms. If any signs or symptoms are presented, the player should be removed from training or the match immediately.

Parents and Coaches Perceptions of Head Injuries

Parents and coaches' perceptions and understandings on head injuries is vital, but research around this topic of interest suggests there is a misunderstanding, despite them having a basic knowledge in this area of interest (Register-Mihalik, Gushiewicz, & Valovich, 2013). Due to the increased focus on head injuries, management protocols for young players are limited and this gives rise to growing concerns for the player's parents and coaches (Bryan, RowhaniRahbar, & Comstock, 2016). Despite some evidence suggesting young players feel pressured from parents and coaches to return to training, despite still displaying symptoms (Rieger et al., 2018), this is empirically un-tested and will form part of this doctoral project.

There is growing concern about concussion in young footballers, yet there is little research on parent's knowledge around concussion. A recent cross-sectional survey study revealed that knowledge of head injuries amongst parents and coaches could be considered marginal at best (Rieger et al., 2018). Coaches cited the misconception that there had to be a loss of consciousness to indicate a head injury, which is not the case. Additionally, and more alarmingly, a quarter of coaches reported they would not remove a player if they suspected a

head injury. Almost one in five parents reported they would not seek medical attention for a head injury and 4% would allow a symptomatic child to RTP (Rieger et al., 2018). This study surveyed 180 parents on their knowledge and beliefs concerning concussion and 86% of the results demonstrated that parents had confidence in their own ability to recognise concussion. However, their results demonstrated several misconceptions around concussion. The results from this study are positive, but due to the variability and misconceptions more education is required. A young footballer's club can play a vital role in this education programme and can inform parents as well as anyone else involved at the club about the correct protocols and symptoms, management, and recovery for concussion.

A more recent cross-sectional study was conducted by surveying parents of youth football athletes from the five largest organised youth football programmes across the U.S. A questionnaire was developed, and their results demonstrated that 85% agreed that head injuries are serious. Parents were most concerned about permanent brain damage their child could suffer after a head injury. The study reported a greater appreciation of perceived risks about head injuries amongst parents who had received education and those who had witnessed or heard about a head injury incidence (Sungwon & Connaugthon, 2021). Based on this, it is essential that parents and coaches are educated to help reduce any potential long-term consequences and to achieve this, appropriate information frameworks must be created.

The Rosenbaum Concussion Knowledge and Attitudes Survey (RoCKAS) was devised to address the misconceptions and reduce concussion incidences as well as identifying the need for an educational intervention programme. The RoCKAS study involved twenty-six English championship footballers. A mixed methods approach included a survey and interview. The survey asked concussion knowledge and attitude questions whilst the interviews asked concussion knowledge, attitudes, and behavioural questions. It identified that some footballers continued to participate in football, despite their concussion symptoms and their failure to

report their symptoms. From their findings, the footballers had a moderate understanding and recognition of concussion when assessed with a pen and paper, but when it came to interviews, the footballers had a poor level of understandings and behaviours about head injuries and appropriate protocols. It is essential that my body of work devises appropriate educational frameworks for players, coaches, parents, sport scientists/strength and conditioning coaches and medical staff to improve concussion reporting behaviours amongst footballers (Williams, Langdon, McMillan & Buckley, 2016).

Another study investigated concussion knowledge and awareness in youth Australian football players and parents. It wanted to determine footballer's maturity in age, history of concussion and years played and if parents who had undertaken any first aid and concussion training had an increased knowledge and understanding (King et al., 2016). 1441 parents and 2814 players completed a survey containing twenty-three questions identifying symptoms, management and RTP criteria. Their results presented a significant difference between knowledge of concussion management and RTP between players and parents. Player's age, years played, and history of concussion did not increase their knowledge. However, parents who had concussion training had significantly improved scores compared to those with no training. Overall, this study identified that more education workshops are required for players and parents with a specific focus on RTP criteria as well as the common and uncommon head injury signs and symptoms to be aware of.

Self-Reported Head Injuries

Self-reported heading measurements have been introduced as a convenient method to quantify the number of headers performed (Harriss et al., 2018). This method has also been used to identify whether head injuries can present long-term complications such as adverse neurological outcomes (Lipton et al., 2013). Evidence has suggested repeated bouts of heading

a ball can result in a decrease in cognitive function including memory and executive planning (Matser et al., 1998, 2001). However, some studies have indicated very few cognitive changes due to heading (Webbe & Ochs, 2003).

When self-reporting, evidence suggests players tend to over-estimate the number of headers during a match, training, or season, whereas the gold standard approach is direct observation (Harriss et al., 2018). Very few self-reporting methods have been validated and the results assume that players are accurately recording incidences (Catenaccio et al., 2016). It is vital to correctly quantify the number of headers during training or a match to ensure accurate data is captured. The validity of head injuries using a self-reporting approach is questionable. Reliable measures are required to accurately record any incidences. This can only occur if players correctly report their number of incidences and current literature states this is not always the case. Accurate estimates require players to correctly recall the average number of headers per game (Rutherford & Fernie, 2005).

A recent study explored whether heading the ball can be associated with neurological impairments (Harriss et al., 2018). The study recalled each player's number of headers over an entire season and multiplied it by the number of games played. This data was captured using self-reports compared to video analysis. Their results presented that all players over-estimated their self-reporting by 51%. Despite this being a convenient and easy method of capturing data, any results should be interpreted with caution.

The overall limitations within my current area of research are inadequate education around head injuries for players, parents and coaches resulting in poor decision making in the RTP process. There is also the potential for head injuries to be incorrectly diagnosed due to lack of education and poor understanding of self-reported incidences.

Outline of Studies

Study 1 – Perceptions and understandings of parents, coaches, players, sport scientists/strength and conditioning coaches and medical staff around head injury protocols.

Aims: This study aims to investigate parents, coaches, players, sport scientist and all medical staff within the wider population of Scottish football to gain an understanding of their perceptions and understandings around head injury protocols.

Participants: the participants for the online survey will be recruited from three sub-groups. These will include (players and parents), (coaches) and (performance staff). Adopting a nonprobability sample, participants will be recruited from all Academy Scottish FCs, to gain specific insights into this area of interest before narrowing my research to a single SFA club's participants. All participants will be informed and invited to take part in my survey via the University's social media accounts and will be selected using my contacts at various clubs and through my supervisor's contacts.

Methods: This study will be a mixed methods descriptive cross-sectional survey. This survey is a modification of two previous studies by King, (2016) and Williams., et al., (2016). This modification is to ensure the survey is appropriate to my target audience in terms of use of language. The survey will ask questions relating to 1) identifying signs and symptoms, 2) head injury management and 3) strategies for dealing with head injuries. At the outset of the survey, an initial question will identify whether the respondent is a parent/player, coach, or performance staff. Closed questions will be multiple choice – 'Yes', 'No' or 'Don't Know'. Scaled questions will also be included, but open-ended questions will be kept to a minimum. Surveys will be completed through an online system (JISC) to ensure data is confidential and anonymous. The survey questions will be reviewed by my supervisors to gain feedback prior to administering a pilot study. Once the survey is ready to be launched, it will be available for a four-month period to allow time for as many applicants to respond. Surveys will be available for completion once ethical approval has been granted.

Analysis: Statistical analysis was performed using IBM SPSS V.27. Frequency distributions will be analysed for sections 1) identifying signs and symptoms, 2) head injury management, and 3) strategies for dealing with head injuries. Due to the unknown direction of the data, analysis for this study aims to replicate a previous study (Ford et al., 2020).

Key outcomes: I will be able to establish the knowledge and understanding of head injuries from parents/players, coaches, and performance staff as well as the strategies used to deal with injuries. This will enable any patterns or trends to be identified and recorded.

Study 2 – Based on the results from study 1. A two-phase follow up study will be carried out at a single SFA club. The two-phased approach will explore the strategies and effectiveness of interdisciplinary head injuries at a single SFA club.

Aims: This study aims to explore the strategies and effectiveness of interdisciplinary head injuries at a single SFA club.

Participants: This stage is when the sample size is narrowed down to focus solely on participants from a single SFA club (i.e., players/coaches/performance staff). The recruitment process (despite not knowing the discipline or stakeholder as yet) has already been signed and agreed by the Club.

Methods: This study will adopt a mixed-method approach. A short survey will be completed by players/coaches/performance staff based on responses from study 1. This will be followed by a series of in-depth interviews (n = 5 coaches), (n = 5 players), and (n = 5 performance staff).

Analysis: Descriptive means and standard deviation will be carried out on the surveys and inductive thematic analysis will be carried out on the interview data.

Key outcomes: I will be able to identify any weaknesses which need to be addressed in order to provide an appropriate head injury management framework for a single SFA club.

Study 3 – Design, planning and development of an interdisciplinary head injury management framework. This study will design, implement, and evaluate an intervention aimed at improving head injury management. Players from within a single SFA club development squad will be randomised into two conditions head injury intervention (HII) and control (CONT). after a suitable pilot study period (i.e., 4-weeks) and a cross-over design will be conducted allowing for one week of wash-out for potential learning effects. At this stage the nature of the content for the intervention group is unknown as it will depend on data analysis from studies 1 and 2. **Participants:** The participants will be players and support staff from a single SFA club.

Methods, Analysis and Key Outcomes: This study, like study 2, is currently unclear and unpredicted due to this study being data informed and will be driven based on the results from studies 1 and 2. Therefore, at this stage I am unable to provide a finalised study outline.

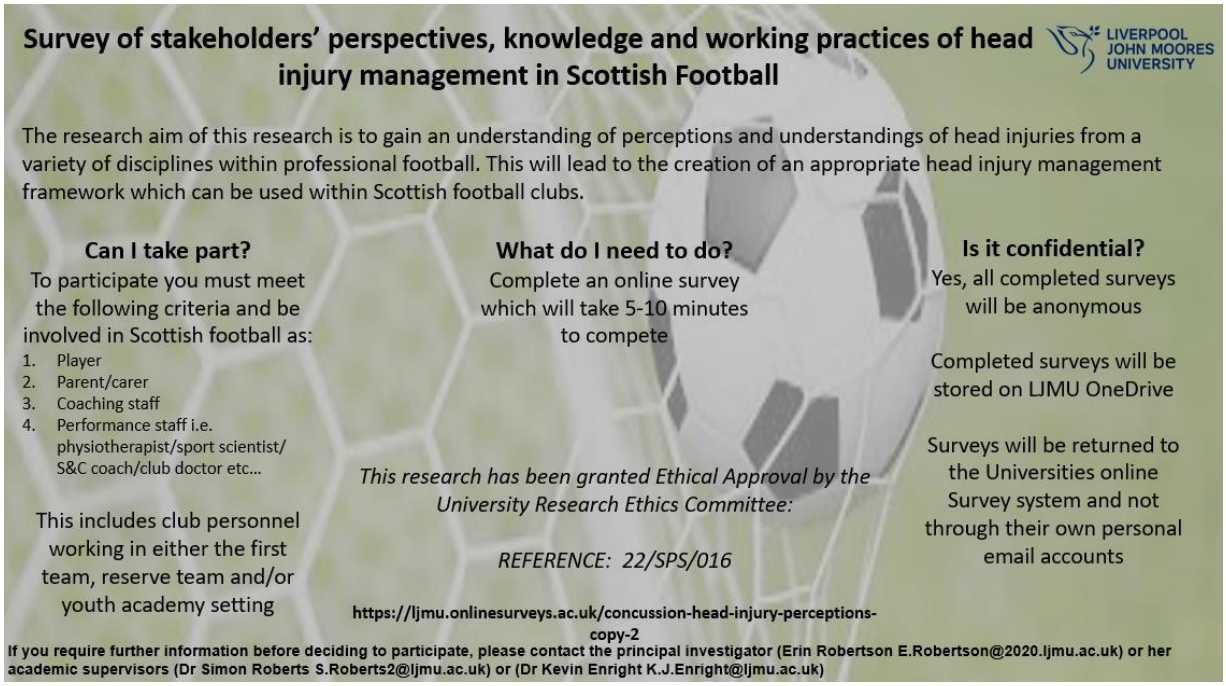
9.1.3 Chapter 3: Research Training Plan

Gantt Chart

Task	2021						2022						2023					
	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec
Employment 24hrs p/w																		
Development days																		
Literature search																		
Supervisory meetings																		
Training plan write-up																		
Feedback on work																		
Falkirk FC 1st Team Cover																		
Training plan submission																		
Ethical Approval																		
Finalise study 1 & 2																		
Conduct study 1 & 2																		
Ethical Approval																		
Finalise study 3																		
Conduct study 3																		
Introduction & literature review																		
Reflection																		
Synthesis																		
PD Submission																		
Viva Voice																		

Figure 8. Gannt chart. Timeline of workload until final PD submission.

9.2 Appendix 2 – Survey Poster



9.3 Appendix 3 – Interview Template Questions

9.3.1 Parents

1. Can you explain the information you have received regarding head injuries?
2. What type of further information do you think you would benefit from receiving?
3. Can you explain the head injury policies currently in place at your child's clubs?
4. Do you feel you can confidently identify signs and symptoms of a head injury with your child? If so – how are you aware of these signs and symptoms? Training?
5. In your opinion, would you say having a sharp pain in your neck, numbness/tingling in your neck and trouble sleeping are possible signs of a sustaining a head injury?
6. Can you explain the RTP protocols after a player sustains a head injury?
7. Can you explain how long a player is unable to train/play for after sustaining a head injury?
8. Can you explain the recovery guidelines that are recommended to be followed after your child sustains a head injury?

9. Do you feel you fully understand current rules and regulations surrounding concussion and head injuries?
10. Do you have any concerns you wish to address?

9.3.2 Players

1. Have you ever received any information regarding head injuries? If not – what would you like to receive?
2. What head injury policies are currently in place at your club?
3. If you ever sustained a head injury, do you think you would be honest and declare the full severity of the injury to your medical team and explain your reasons behind your response?
4. If you have previously sustained a head injury and were out of training – did you feel pressurised into returning to training/playing and can you explain your reasons for this response?
5. If you previously sustained a head injury – did you feel as if you fully recovered before returning to training/playing?
6. How confident are you at identifying signs and symptoms if you have a head injury?
7. Do you believe coaching staff take concussion and head injuries seriously?
8. Can you explain the current rules and regulations surrounding concussion and head injuries within Scottish football?
9. What are the RTP protocols after sustaining a head injury?
10. Do you have any concerns you wish to address?

9.3.3 Coaches

1. Can you explain the head injury policies currently in place at your club?
2. Do you believe you could benefit from more training regarding head injuries and the current protocols?

3. What would you do if a player receives a head injury during training or a game?
4. If one of your players sustained a head injury, would you be honest and declare the full severity of the injury to your medical team?
5. Can you explain the RTP protocols, and would you follow them fully?
6. How do you feel about players in the previous study stating that they feel pressurised into returning to play when they do not feel fully recovered or that they do not declare the full extent of the head injury, so they do not get dropped from the team?
7. Can you explain your thoughts and opinions on whether there is enough attention paid to players well-being and safety when it comes to a player sustaining a head injury?
8. Can you explain any education that you may have received surrounding signs and symptoms of a head injury and are you confident at identifying signs and symptoms?
9. Is there any more training you feel you or your club would benefit from?
10. Do you have any concerns you wish to address?

9.3.4 Performance Staff

1. What are the head injury policies in place at your club?
2. What training have you received regarding concussion and head injuries?
3. What are the RTP protocols for a player returning to training after sustaining a head injury?
4. Where do concussion and head injuries get recorded and what information do you record?
5. Can you explain your thoughts on some performance staff members/players feeling pressurised into by coaches/managers into allowing a player to continue playing/training?
6. How confident are you at handling a head injury incident?
7. Do you receive refresher training courses?

8. Is there any other training/information you feel would be beneficial to you or your club?
9. Do you fully understand the rules and regulations surrounding concussion and head injuries?
10. Do you have any concerns you wish to address?