

Considering Occupational Safety Awareness in Elite Rugby: A Game of Near-Misses

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Abstract: *Rugby players often experience risk exposure that has potentially very serious long-term health implications. Safety and risk awareness in rugby has thus become crucial especially considering the COVID-19 pandemic. This study aimed to advance understanding of safety awareness within elite rugby by exploring relationships between players, their behaviors, and the role stakeholders play in support and management. This study explored safety awareness in the context of elite rugby by utilizing document analysis, and an ethnographic approach incorporating observation, and semi-structured interviews. Participants were from rugby teams in Ireland. Observations occurred between August 2017 and May 2018, focusing on training sessions and competitive games. Data gathered were analyzed by thematic analysis using software NVivo. The findings identified three key themes: first, the risk to rugby players long-term health consequences tended to be underestimated; second, risk may be aggregated by players' risk-taking behavior as a result of social exposure from stakeholders; third, safety practices in rugby, such as injury reporting, need to become more proactive rather than reactive. The dilemma that rugby players who prioritize their performance have to compromise their health-and-wellbeing can be ameliorated by safety culture cultivation, initiating with an encouragement of open communication on safety concerns.*

Keywords: Health and wellbeing; risk-taking behavior; injury prevention; athlete welfare; ethnography; sports; rugby

Introduction

Rugby union as a contact sport exposes players to an occupational risk of injury and illness that can potentially have serious immediate and long-term health implications. For example, incidence of injuries which can have a long-term impact, such as osteoarthritis,



joint replacement, osteoporosis, and anxiety, has been found to be significantly higher among former rugby players than players of other contact sports (Davies et al., 2017). During competitive games, rugby injuries range from 30 to 90 per 1,000 player match hours (Kaux et al., 2015). In New Zealand Rugby, players in the position of "forward" had a higher overall injury rate, which can be even 120 incidents per 1,000 player match hours (Targett, 1998). During rugby training sessions, the injury rate is approximately six incidents per 1,000 player training hours, with most injuries resulting from player contact (Kaux et al., 2015). Comparing data gathered over 20 years, an injury surveillance study showed incidence of injury during the 2015 Rugby World Cup (RWC) was 90.1 match injuries/1000 player-match-hours (backs: 100.4; forwards: 81.1) and 1.0 training injuries/1000 player-training-hours (backs: 0.9; forwards: 1.2) (Fuller, Taylor, Kemp and Raftery, 2017), which was similar to those reported for RWCs 2007 and 2011 (Fuller et al. 2008; Fuller; Sheerin and Targett 2013).

While the study indicated that reported injuries have reduced somewhat in recent years, the risks associated with specific injuries has gained more attention with severe impacts such as concussion (Gardner, Iverson, Williams, Baker and Stanwell, 2014; Reid, Hume, Theadom, Whatman and Walters, 2019). The risks to rugby player long-term health and wellbeing remain and a greater understanding is needed to ascertain the factors which can be utilized to manage (and minimize) such risks. In addition to the calls for the ban on tackle and the questioning of misleading data reported on rugby injury risks (Pollock, Anderson, Raftery and Verhagen, 2016), rugby safety studies should be expected, welcomed and essential moving forward as part of the evolution of rugby culture.

The prevailing culture of risk tolerance in elite sports (Schnell, Mayer, Diehl, Zipfel and Thiel, 2014) does raise significant concern in relation to how contact team sports such as rugby can keep their athletes safe and healthy (Buggy et al., 2020). In rugby, various injury prevention programs, such as RugbySmart (New Zealand Rugby Union) (Gianotti, Quarrie and Hume, 2009) and BokSmart (South Africa Rugby Union) (Posthumus and Viljoen, 2008) aim to provide rugby players with injury prevention information. However, despite the physical, violent, tough, and aggressive nature of rugby, there have been a number of studies on safety/risk awareness from a sport culture perspective, such as pain and injury awareness (Howe, 2001), sport ethics (Madrigal, Robbins, Gill and Wurst, 2015) and culture of risk (Nixon, 1992, 2016), but with fewer studies viewing safety/risk awareness in rugby from an occupational perspective.

As a distinct discipline, Occupational Safety and Health (OSH) aims to maximize the degree of physical health, mental health and well-being of workers in all occupations through the minimization / negation of occupational risks (ILO, 2019). High-level safety awareness has a strong relationship with desirable safety-related behaviors and outcomes regardless of the occupational setting (Zohar, 2000). From an OSH perspective, if safety awareness in rugby (such as attitude towards injury and illness) was given a similar weighting as safety awareness in other high-risk occupations, the potential benefits to rugby athletes' wellbeing could be highly significant. Based on previous definitions (Zohar, 2000), safety awareness in



this study refers to rugby personnel's shared perceptions of policies, procedures, and practices relating to safety value within a rugby context. Generally, there are three key steps to raising safety awareness and minimizing occupational risk in an organization (ISO, 2018; Fernández-Muñiz, Montes-Peón and Vázquez-Ordás, 2012; ILO, 2001): identify the risk at the workplace, analyze the processes associated with the risk and control the risk through the prescribing of control measures.

Every working environment is unique, but the principals of risk assessment can be applied to even the most unusual of working environment including elite sport settings. Risk identification is the premise of safety management as awareness is contingent on understanding the risks to oneself (Swuste, 2008). Failure to adequately identify risks pertaining to each unique occupational environment can result in a lack of understanding accident causation factors for a particular occupation. A workplace hazard is a source or a situation which has the potential to cause harm in terms of human health or business property, or a combination of both (Wells, 1996). As a part of risk assessment, hazards should be identified considering the uniqueness of the working environment. For example, in elite rugby, all the objects and persons could be safety hazards to athletes during a competitive game.

Risk analysis focuses on the specific evaluation of risk factors and associated impacts, such as how the risk happens, where it happens, how frequent it may happen, what is the consequence and to what or (most importantly) whom (Scandizzo, 2005). Subsequent risk control is then utilized to develop and implement occupation and workplace specific measures to prevent / negate the risk and the associated impacts (Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás, 2012). To complete any of these steps requires high-level safety awareness among all employees in an organization which thus requires open and transparent communication surrounding workplace risks and the resultant measures developed to control them for the benefit of all. If such steps are managed appropriately and in a timely and cyclical fashion (Woźniak, 2019), a positive long-term safety culture can emerge and be fostered in any organization customized to their uniqueness (Glendon and Stanton, 2000).

As a counterpoint to the “win at all costs” concept (Volkwein-Caplan, 2013), the purpose of this study is to advance understanding of safety awareness within the unique occupational setting of rugby as these behaviors and relationships are important factors for developing a positive safety culture (Glendon and Stanton, 2000). This was accomplished by the exploration of relationships between player behaviors and stakeholder inputs from an OSH perspective through a rugby outsider stance. The potential to foster a positive safety culture within rugby has the significant capability to improve players' long-term health and wellbeing (especially during COVID-19 pandemic), leading to more productive and longer impactful athlete careers, while benefitting not only the players but also the sport itself.



Methodology

A critical realism stance (ontological realism and epistemological constructivism) advocated by sport researchers (North, 2017; Wiltshire, 2018; Fletcher, 2017) is appropriate for facilitating an examination of the context and perspectives of specific organizations (Brown, Fleetwood, and Roberts, 2003) or cultures (Shannon-Baker, 2016). According to critical realism ontology, there are three levels of truth: empirical, actual and real (Bhaskar, 1998). The most superficial level is the empirical truth which is what can be observed or experienced. Underneath the empirical level is the “actual”: what is going on that may not be observed but which is regulating the empirical. Bhaskar posited there was a final layer called the “real” underpinning the “actual” (Bhaskar, 1998). Ontological realism means “there is a state of the matter which is what it is, regardless of how we do view it, choose to view it or are somehow manipulated into viewing it” (Archer, 2008, p. 195). In this case, ontological realism would suggest there are mechanisms behind the phenomenon that causes injury and illness in sports. However, critical realism epistemology indicates the approach we acquire the truth is limited. As epistemological constructivism suggested, the mechanisms may never be revealed due to the limitation of events occurrence and human interpretation of events observed (Fletcher, 2017). For instance, sports professionals are often normalized to practices which, from an OSH perspective, would be considered dangerous, excessively risky, and problematic for organizations to manage. In elite rugby, the competitive, physical and often violent nature of the game would be a significant challenge to control, when considering OSH management principles.

A hybrid research framework could be a good approach to capture the dynamic iterations of evidence-based research in various fields (Zhang, 2020). Aligned with critical realism stance, this study is designed to explore elite rugby participants from an outsider lens and provide an alternative explanation, in comparison to sport cultural studies, that facilitates the development of practical implications for player health and wellbeing. This study utilized ethnographic inquiry in line with similar studies that triangulated data collection methods such as document analysis, participant observation and semi-structured interviews. In order to address limitations in observable events, multiple data collections can be adopted to enhance empirical adequacy (Ronkainen and Wiltshire, 2019). For example, a similar health-related study on social barriers to exercise participation in a competitive working context adopted data collection means of participant observation, individual interviews and exercise logbooks (Rossing and Jones, 2015).

Participants

In this research, the participant organization was an elite rugby club called “Iron Warriors” (pseudonym) fully endorsed by the Irish Rugby Football Union. Participants involved in this study included Iron Warriors players, support staff (e.g. medical, coaching, and management staff), opposing teams, and spectators on both sides. The first author as a research instrument (Allen, 2004) immersed herself in rugby settings which facilitated the adoption of an observational lenses comprising primarily as an outsider. When conducting the research, the



first author was a female Chinese PhD student with an undergraduate and postgraduate background in sport management augmented with supplemental OSH postgraduate training, but with no specific knowledge in rugby performance prior to this ethnographic inquiry. This enabled a critical research *outsider* perspective beyond the established theory to explore phenomena in relation to players' safety awareness. While adopting such a unique consideration of the topic through provision of this novel view of the situational environment, we acknowledge that a deeper level of analysis is warranted in order try to identify solutions that may be easily noticed by an *insider*.

Procedure

The data collection timeline of this ethnographic inquiry, presented in Figure 1, adopted three methods: document analysis, participant observation and semi-structured interviews. After obtaining institutional ethical approval, Iron Warriors players' document of relevant injury-related data from 2016-2017 were provided by the club's chief physiotherapist and the first author obtained the club director's permission to observe Iron Warriors' training sessions and competitive games. Iron Warriors' players and support staff were provided with a verbal briefing regarding the study's purpose, methods, and potential data uses. The analysis of the injury-related document familiarized the first author with the knowledge of rugby injury, as well as specific types and locations of injuries involved in elite rugby prior to the participant observation. Subsequently, similar to Rossing and Jones' (2015, p. 41) study, the data gathered in participant observation were used to develop a semi-structured interview guide, and "inform subsequent interviews" which were, in turn, analyzed with a view towards sharpening (Dwyer, Gill, and Seetaram, 2012) the final participant observation period. The three methods in this ethnographic inquiry "were complementary and mutually sustaining, with each informing the next in a developmental sequence" (Rossing and Jones, 2015, p. 41).

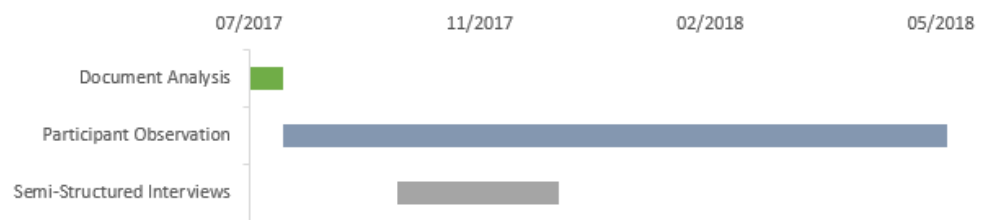


Figure 1. Data Collection Timeline

Participant Observation

The first author acted as a an unobtrusive spectator acting as a non-participant, outside observer or so-called peripheral member researcher, only interacted with the cohort for essential rapport building (Adler and Adler, 1987) in an open environment from August 2017 to May 2018. Training sessions were observed between 6pm and 9pm, usually twice weekly at the training pitch while competitive games were usually observed during weekends at match venues. Observation ended when the rugby season concluded, primarily describing

events and settings, with specific attention paid to communication, interactions, actions, and behaviors (Robson, 2002) among the clubs, opposing teams and spectators. The field notes were transcribed and organized into more coherent vignettes the evening of or next day after observation, with 22 entries and over 10,100 words in total.

Semi-Structured Interviews

Informed by the initial stage of participant observation, the first author identified that additional key individuals (club physiotherapists) could provide crucial information regarding players' safety awareness. Since these physiotherapists were mostly clinic-based, and out of participant observation range, the semi-structured interview was designed to collect further information. Three of the four physiotherapists (all men) who had provided medical treatment for Iron Warriors agreed to be interviewed. The interview guide's development was primarily informed by research questions and preliminary findings identified during nine months of participant observation as Appendix 1. This guide was pilot tested with three respondents (a male PhD student conducting research on rugby injuries, a female PhD student with sport physiotherapy qualifications and experience, and a former elite male rugby player), resulting in minor amendments. The first author conducted all individual interviews and used a conversational and flexible approach towards data collection, involving clarification and elaboration probes and afterwards transcribed the recorded interviews verbatim. The interviews were digitally recorded with the interviewees' written permission, aligned with the ethical exemption granted by the human research ethics committee of the first author's affiliated university. The interview data provided the first author with more knowledge, and her next observation phase was therefore inevitably prone to an insider stance. For example, her focus on how rugby personnel reacted to risks was gradually converted to why they did so. The insider-outsider role enabled a distinctive lens for this study as aforementioned.

Data Analysis

For document analysis, players' relevant injury-related data (n = 124 observations) were cleaned, entered, and analyzed using descriptive statistics. Since both participant observation field notes and interview transcripts were qualitative data, they were imported into the NVivo data management tool for a reflexive thematic analysis (Braun and Clarke, 2006, 2019). Initially, the first author familiarized and immersed herself in the data by reading the text and identifying meaningful information. During this process, the first author descriptively labelled the meaningful units with data-driven codes aligned with thematic analysis procedures (Braun and Clarke, 2019). When all interview data and partial observation data were inductively coded, similar types of codes were merged or clustered into themes (Smith and McGannon, 2018) primarily based on the three OSH management principles (risk identification, risk analysis and risk control) as the abductive analysis process. This process was completed by the first author in consultation with the second author (an expert in OSH). Subsequently, the first author generated a primary codebook with themes, descriptions and example codes for all other co-authors' review and critical analysis. After reflective and



iterative discussions among all the authors, the codebook was updated for guiding the rest of the data coding. During the analysis, this process of updating the codebook by reflective discussions has been repeated several times to ensure all authors were satisfied with the theme framework identified (see Table 1). Finally, the first author re-examined all the codes, themes, and categories, and produced a write-up by utilizing verbatim statements embedded within an analytic narrative incorporating participants' voice which was then evaluated by all co-authors. An extract of the codebook is also available as Table 2.

Table 1. The framework identified from ethnographic inquiry

Category	Theme (participants' voice)	Example codes
Risk Identification in Rugby	Identification of risk possibility ("It's totally an accident")	<ul style="list-style-type: none"> • Injury player normalised the accident • Falls and collisions normalised in rugby as a physical contact sport
	Identification of potential risk impacts ("After 15 or 20 years' time, they face significant issues")	<ul style="list-style-type: none"> • Immediate health impacts; • Long-term health consequences
Risk Analysis in Rugby	Toughness of rugby player ("Shut up and get up")	<ul style="list-style-type: none"> • Not showing pain; • Not complaining; • Playing with injury
	Stakeholders' expectation for rugby performance ("Tackle! Tackle! Super hit!")	<ul style="list-style-type: none"> • Expectation from organisation such as coaches and teammates; • Expectation from Stakeholders outside organisation such as spectators
Risk Control in Rugby	Risk prevention measures ("We are all made of steel!")	<ul style="list-style-type: none"> • Physical training; • PPE use
	Risk impact control ("No one is going to die if you lose the game")	<ul style="list-style-type: none"> • Control measures implemented by rugby supporting staff; • Control measures implemented by players

Note. PPE = Personal Protective Equipment



Table 2. An extract of codebook

Category	Example Themes	Description	Example codes
Risk Identification in Rugby	Identification of risk possibility	A statement/observation describes rugby personnel reaction towards potential risk in rugby, including accidents and near-misses etc.	<ul style="list-style-type: none"> • Injury player normalised the accident <i>Doctor E then wiped away the blood using a sterile gauze and inserted two stitches into his eyelid... I was not able to find any sign he was suffering, I asked him whether it was painful. He smiled and said it was sore..</i> • High frequency of falls and collisions in rugby <i>He suddenly jumped up to catch the ball, but failed to catch it cleanly, and it hit his body and bounced away. He fell to the ground, then stood up quickly.</i>
	Identification of potential risk impacts	A statement/observation reflects rugby personnel attitude towards potential risk impact, including short-term and long-term health consequences etc.	<ul style="list-style-type: none"> • Immediate health impacts; <i>The player left the pitch. He said he felt there was a moment his head sounded "wrong". The player was removed from play (and did not return) for suspected concussion and was evaluated pitch-side by a doctor.</i> • Long-term health consequences <i>"...they face significant issues like arthritis, chronic pain, maybe back pain."</i>

Rigor and Trustworthiness

Throughout the study, the trustworthiness has been considered from three aspects, descriptive validity, interpretive validity and theoretical validity in line with critical realism stance (Ronkainen and Wiltshire, 2019). First, the nine-month participant observation enabled a prolonged engagement with rugby context to achieve the empirical adequacy of the investigated phenomenon (Ronkainen and Wiltshire, 2019), the effectiveness of which was also reinforced by adopting additional strategies, such as document analysis and semi-structured interviews (Silk 2005; Kawulich, 2005). Additionally, to ensure descriptive validity, the first author adopted low-inference descriptors to describe behavior and activity concretely (Pelto and Pelto, 1974). As a novice researcher, the first author was encouraged to

take field notes by using descriptive terms rather than academic terms, which allowed the original behaviors and interactions to emerge from the participants under observation (Kawulich, 2005). Second, for interpretive validity, the analysis was initiated from an inductive coding process by the first author, the codes of which were not predetermined prior to abductive process to minimize potential *a priori* bias during interpretation. Throughout the data analysis process, the role of other co-authors can be described as the so-called “critical friends” (Smith and McGannon, 2018), by constantly challenging the first author’s coding process and thematic data categorization (Stake, 2006), as well as scrutinize her interpretations to ensure the results were valid and grounded in the data (Cowan and Taylor, 2016). Third, for theoretical validity, the data analysis process included an iterative discourse between the co-authors (with academic profiles in OSH and sports management providing multi and interdisciplinary perspectives) to ensure that the potential application of OSH risk management principles was appropriate in an elite rugby context.

Ethnography is conventionally written in the first person (Gullion, 2016). While there are four co-authors to this study, the ethnographic findings are presented in the singular narrative of the first author, because the first author as the research instrument conducted the data gathering in the field. The singular narrative from the first author’s point of view is analogous to the camera angle in film to provide the phenomena observed through her particular perspective (Gullion, 2016). The benefit of this approach is that the first author is completely new to the field that they are observing and that the first author then has the co-authors as “critical friends” who are experts in the field to discuss and expound on the observations. This approach is highly immersive which can provide readers with a highly original account of information (Khan, 2018). However, all statements presented and discussion arising from the singular narrative ethnographic findings were critiqued and discussed with all co-authors to ensure rigor and trustworthiness throughout the study. All co-authors contributed to the research design and conceptual framework that provided the scaffolding to the research. All co-authors were involved in the development of this paper as part of the larger study.

Due to the limitations of human experience and interpretation, observed empirical events may not be the entire truth (Fletcher, 2017); thus, we acknowledged ontological and epistemological matters regarding the complexity of insider/outsider researchers, and the importance of considering how researcher/researched status shaped knowledge production throughout the research process (Hayfield and Huxley, 2015; Griffith, 1998). We posited that the first author’s outsider status, for the most part, allowed her to observe what an insider may take for granted (Hayfield and Huxley, 2015, 103; Griffith, 1998). This outsider status can enhance understanding of the community being researched (Bridges, 2001), and can allow for valuable insight and more nuanced interpretations of participants’ experiences.

Findings and Discussion

The data obtained from document analysis indicated the top three injury locations among Iron Warriors were shoulders (27.4%), thighs (21.0%), and knees (19.4%). These data familiarized the first author with the common health issues in rugby context guided her



attention on what to focus on during the participant observation. The analysis of participant observation and interview data identified three higher-order categories: risk identification in rugby, risk analysis in rugby, and risk control in rugby. Within these categories, observational data were presented utilizing parenthetical dates, and interview data used pseudonyms for interviewees (e.g. Physio A, Coach B). The ethnographic findings are presented from the perspective of the first author (after discussion and approval from co-authors), utilizing an outsider, first person narrative approach (Bridges, 2001; Kawulich, 2005; Khan, 2018).

Contextual Insights

Since the Iron Warrior Club Director (Management D) was a friend of my previous sport management lecturer, I (the first author) had the chance to introduce my research plan to Management D. He showed a great interest in my research and briefed me with the training and competition schedule of Iron Warriors. That was the day my first observation initiated. Some players and staff were carrying equipment to the rugby pitch, some players were just arrived by car, and some more players were changing shoes at the pitch side. Management D told me there would be more players participating during the next several weeks because it was just the beginning of the season.

The rugby pitch was located in a public space, so there were always people wandered around, or stopped and watched for a while. The participants were not informed about my observation since my observation initiated as a peripheral member researcher. As a result, however, rugby players and staff were usually very curious about my existence instead of other spectators, maybe because of my Asian appearance and female gender. Their curiosity sometimes disrupted my observation, but sometimes also provided me with important information in the context. Gradually, their curiosity subsided over the time as I became a peripheral fixture in their environment. In line with critical realism, and cognizant of being an unobtrusive observer (Adler and Adler, 1987), I would not impose any of my OSH concepts on the participants during the informal communication to avoid their reality being “contaminated” by my presumption. Some Iron Warriors’ felt confused about my research especially the OSH-related terms:

“You mean, the risk that our players will be falling onto the slippery floor in the changing room?” Coach B asked me. “Well, that could be an aspect of occupational health and safety, of course, but I’m also looking at the risks when they are playing, such as injuries.” I answered. Not surprisingly, after I said “injuries”, Coach B’s confused facial expression suddenly disappeared. (17 August 2017, Iron Warriors training)

Most rugby coaches and players preferred to separate “injury” from “health and safety”. From documents analyzed prior to participant observation, I knew injury was a crucial health and safety issue in rugby. However, I remained open to adopting alternative topics and rugby related issues if it could be relevant from an OSH perspective also. This was why I preferred



to adopt OSH-related terms, rather than utilize sport or rugby-related terms during the conversations with rugby personnel at the beginning.

However, we (authors/researchers) soon found that my conversations with rugby personnel appeared to be a little unusual, because they tried to avoid the term “safety”. What often happened was when I said “health” and “safety”, players and coaches said “injury” and sometimes “welfare”, while we were actually talking about the same thing. As I observed, coaching staff and players often separated sporting injury out of general health-and-safety issues. This could be because sporting injury has been normalized in their everyday routine, so coaching staff and players just considered sporting injury as a reasonable result which “should” occur, similar as previous study (Madrigal et al., 2015) reported. In other words, players who participated in rugby sport had already realized that the sport they were undertaking was actually not safe because of the inevitable sporting injury risk, so it seemed ridiculous to use the term “safety” in rugby context.

Contrastingly, we found medical and management staff could immediately reflect upon players’ various risks when they heard OSH-related terms. They understood and accepted that OSH language applied to the role an individual engaged in on the field. As a result, the physios at the pitch side became the first group of people I became familiar with since they usually talked with me when nobody was injured. More often, the players with injuries stayed with the physios at the pitch side became familiar with me as well, by asking me various questions you can think of, such as, “You are a PhD student, but you have your own office?” and “Are you a spy from China?”, “What are you doing here?” Although many conversations were irrelevant to the research topic, I did benefit from the passive participation (Adler and Adler, 1987) in this ethnography by gaining substantial rugby context related knowledge. Gradually, I came to understand some specific terms in rugby by learning from my conversations with the injured players at pitch side. I learned that each rugby team usually had its own language for internal communication. This could be a code that can be only understood by certain teammates so that they can pass the message between each other during the competitive games (very common when taking possession of the ball during a lineout) while the opponents cannot figure out their strategy. It became apparent during my observations that the term “safety”, in rugby performance context, have a slightly different meaning.

The 1st player (the ball-carrier) tried to stretch his arms as far as he can to reach his teammates when being brought down, until the 4th player shouted “Safety!” after successfully taking over the ball from him. (29th August 2017 Iron Warriors Rugby Training)

During participant observation players sometimes shouted “safety” to inform their teammates that the ball was safe and not possessed by the opposition team, and the original meaning of “safety” had been somehow diluted. With more rugby terms I learnt, I was able to adjust my language when communicating with the observation cohort, and they seemed to get used to



my existence, as a member in their rugby community. Otherwise, it may be difficult for me to get information of interest if I was alienated by the observation cohort as an outsider.

Risk Identification in Rugby

“It’s Totally an Accident”

The day I began participant observation, Management D asked me why I was watching so far away from the pitch. I told him I was afraid of being hit by the ball, especially when taking my field notes. Management D burst into laughter. He said this was just training, and there would be an informal competition soon for training purposes. Two weeks later, I went to this “training competition”. Based on the blood injuries I observed, I could not understand how this could be called a training competition. Undoubtedly, rugby personnel and I had a totally different interpretation of the fierceness of the injury incidents during this “training”. It was difficult for me to accept the fact that a blood injury could occur during informal competitive games:

There was a bleeding cut near Player Y’s right eye. Doctor E then wiped away the blood using a sterile gauze and inserted two stitches into his eyelid. I asked Player Y how he got injured, and he told me “it’s totally an accident”. Later, I learned his wound was the result of another player’s boot blade. Since I was not able to find any sign he was suffering, I asked him whether it was painful. He smiled and said it was sore. (1 September 2017, Iron Warriors vs Dublin R)

As with Player Y, I did not observe distressed expressions from most of the injured players. I considered maybe it was common for rugby players to get injured. During the first few days of observation, I spent a lot of time counting how many times a player fell or collided with another player. This was simply because in a general workplace, falls or collisions would be considered apparent occupational risks, which should be immediately controlled or even eliminated:

8:05 pm. Players started a practice competition using half the pitch. I tried to count how many times these players fell within 10 minutes. Some of them fell and rolled on the ground. Some fell, but still tried to move or roll forwards, then finally fell completely. After I counted 33 falls, I gave up. Additionally, there were a lot of collisions I could not count either. (17 August 2017, Iron Warriors training)

Prior to the commencement of research, I knew generically that rugby was a highly physical contact sport without having witnessed it; however, I was astonished by my initial observations of these fierce, highly physical falls and collisions. Sometimes I was not able to distinguish whether players were fighting for possession of the ball or just fighting each other. It took me a long time to accept that falls and collisions were basic elements of the game, and would be common observations in various training sessions and competitive



games. In addition to specific rugby techniques, even the simple action of catching the ball could incur injury risk:

The player waited to catch the ball kicked from a distance. He focused on the ball while adjusting his position based on the ball's direction. Then, he suddenly jumped up to catch the ball, but failed to catch it cleanly, and it hit his body and bounced away. He fell to the ground, then stood up quickly. (5 October 2017, Iron Warriors training)

The action described above illustrates that, though falling may not directly cause an injury, it was undoubtedly a near-miss, a narrowly avoided accident. In general workplaces other than sports, near-misses as indicators should also be reported for seeking relevant control measures, to reduce probable dangerous occurrences in future. In rugby, however, it would be ridiculous if every fall or hit was reported for possible avoidance.

From an OSH perspective, rugby could be viewed as a game of near-misses, in which rugby players have already accepted a certain level of risk. The representative quotation as the theme of this section "It's Totally an Accident" indicated that the injured player thought the accident he came across was a small probability event which could rarely happen. As a result, he underestimated the risk and may not be more cautious about the similar risk in the future rugby play. From an OSH perspective, any unexpected event has the potential to disrupt the workflow in process, regardless of whether or not the event actually causes injury or damage, should be regarded as an alarm that an accident may happen, including near misses (Jones, Kirchsteiger, and Bjerke, 1999). If the player has a high level of safety awareness, he should report the probable risk even though he did not suffer the blood injury, instead of owing the accident to his unluckiness to make light of it. Then, the management can handle the accident and take measures to prevent same kind of events may have in common the potential to affect player safety.

"After 15- or 20-Years' Time, They Face Significant Issues"

Injuries deserved my attention, as they can have either a short or long-term health impact on rugby players and frequently happened. Short-term impact was easy to notice; however, players usually ignored long-term consequences of injuries, as Physio A mentioned:

After 15- or 20-years' time they face significant issues like arthritis, chronic pain, maybe back pain. They may regret play on the pitch possibly, but definitely not presently, when they attend the clinic.

An injury could be "any physical complaint, which was caused by a transfer of energy that exceeded the body's ability to maintain its structural and/or functional integrity, that was sustained by a player during a rugby game or rugby training, irrespective of the need for medical attention or time-loss from rugby activities" (Fuller et al. 2007, 329). However, in reality, it was difficult for physiotherapists to immediately identify certain injuries if players



did not report them during training or competitive games. Observed injuries could be roughly classified in three categories: head injury, blood injury, and extremity injury. Among these injuries, concussions are common, occurring both in competitive games and (less frequently) during training sessions, and can lead to serious long-term effects threatening a player's lifelong well-being (McKee et al., 2009). Similarly in other sports, such as football, whether players perceive concussion as an occupational risk may influence their symptom reporting behavior (Coffey et al., 2018). I did witness a suspected concussion during a competitive rugby game, but never during training sessions:

The player left the pitch. He said he felt there was a moment his head sounded “wrong”. The player was removed from play (and did not return) for suspected concussion and was evaluated pitch-side by a doctor. (12 November 2017, Iron Warriors)

Recently, rugby was reported to be facing lawsuits on a similar scale to the NFL, which has been paying out over one billion dollars to retired players who have sustained head trauma (Ingle, 2020). A group lawsuit pertains to concussion that rugby players suffered during their playing careers, who have now retired due to concerns over the lasting effects of repeated brain injury (Watterson, 2020). Many of these players are former internationals from Six Nations Championship unions, including players from Britain and Ireland, all of whom have sustained head injuries and suffered from typical concussion symptoms of migraine, loss of memory, insomnia and depression (Guskiewicz et al., 2007).

Comparatively, a blood injury was much easier to distinguish during my observations. There are clear regulations determining whether a player can continue playing when a blood injury occurs, as these injuries could lead to serious health concerns if they are not managed. Coincidentally, when I spoke with Doctor E, he told me Player Y was worried that the scar on his eyelid would damage his appearance during a photoshoot at a forthcoming graduation ceremony. I was surprised that a player was more concerned about the impact on his appearance than the potential health consequences of this injury. This aligned with my observation that players may often underestimate injury risk.

Frequently, I saw players experiencing a light pain reaction for a short time, but I was not sure if it was an injury. My critical realism stance would suggest that this was a limitation of my observation as I may have not been able to recognize the event when it occurred. In this circumstance, I marked the following observation as a minor extremity injury player may not report or allow them to stop playing:

With 20 minutes remaining, an Iron Warriors player injured his knee, the physio assessed, massaged and sprayed ice spray on the knee, then the player jumped up and joined the scrum. (14 April 2018 Iron Warriors vs Dublin K)

A so-called minor injury should alert players that part of the body could be on the brink of an overuse injury. Untreated overuse injuries can produce long-term symptoms and negative



health consequences (Bahr, 2009). Players should pay more attention to how these alerts impact the risk of being injured or re-injured. As Physio A explained:

There's no point in putting players in the pitch if they are not fit. If I'm 90% fit and you are 100% fit, it's always better to have you on pitch than me. I think they know that, like players who are 80% or 90% fit. They are not able to play well, possibly get reinjured, possibly get injured worse.

If it was a severe extremity injury, the most direct impact would be acute physical pain. In that case, the player could not continue playing, as the injury would hinder performance:

A player injured his foot. His teammates supported him on either side off the pitch. The coach followed them. The two teammates went back to the pitch after several minutes. (26 October 2017, Iron Warriors training)

According to medical literature, many symptoms result from playing rugby may lead to long-term health consequences. For example, Former elite rugby player with a history of concussion were associated with small to moderate neurocognitive deficits (as indicated by worse complex attention, cognitive flexibility, processing speed and executive functioning scores using the Central Nervous System Vital Signs test) (Hume et al., 2017); outcome of musculoskeletal injuries range from complete recovery to death based on injury severity and location (Kujala, Orava, Parkkari, Kaprio and Sarna, 2003; Quarrie, Cantu and Chalmers, 2002), but even though the athletes are lucky to recover, there could be more degenerative changes in their joints and spine at an old age (Kujala et al., 2003); hepatitis B and C viruses and even HIV (Human Immunodeficiency Virus) may be transmitted via bleeding wounds (Stacey and Atkins, 2000). Furthermore, one risk type may aggregate another risk type of the rugby player, such as concussion, which may increase the risk of subsequent musculoskeletal injury (McPherson, Nagai, Webster and Hewett, 2019). Thus, occupational risks in elite rugby identified include two categories: the risk of short-term unwellness (such as trauma, illness, strain and injury) and the risk of long-term ill-health in the future (such as osteoarthritis, joint replacement, osteoporosis and dementia).

For individual players, short-term unwellness is the temporary negative health outcome that may hinder their rugby participation for a period, but the risk of ill-health into the future is often neglected which may affect their long-term wellbeing. As the theme quoted from Physio A: "After 15- or 20-years' time they face significant issues." In addition to the current concerns raised by the COVID-19 pandemic, rugby players need to improve their risk identification awareness in order to correctly recognize the risk and foresee the probable long-term consequence.



Risk Analysis in Rugby

“Shut Up and Get Up”

Sometimes, what interviewees told me may not consistent with my observation findings. For example, when talking about coaching staff attitude towards player safety during the interview, Physio A stated:

I don't think coaches will put pressure on players if they are injured. I've never seen, it's never been an issue. You know coaches like to see, be keen to see their players to play, but I think that decision often made by the player to play.

So I presumed management staff such as coaching staff would not encourage players to play with injury or engage in risky behaviors. However, as my observation progressed, I realized there was an invisible power influencing players' injury-related decision-making. During training sessions, I had several informal conversations with Management F. When discussing the many tackles or falls during training, he said players would just get up. They would usually be told to “Shut up and get up!” Gradually, I found “shut up and get up” was more than a physical action expected of rugby players; rather, it was part of an attitude of toughness that prevailed in the context. I had observed such tough behaviors during training sessions:

I observed a player frowning. The pain was obviously limiting his walking. To my surprise, he ran back to the pitch after a quick stretch.... When the drill finished, he hobbled to the pitch side to drink water. (17 August 2017, Iron Warriors training)

Also, during competition, the toughness can be reflected by the way players involved in collisions mask pain:

An Iron Warriors player ran to tackle him, but the opposition player ran through him, knocking him backwards. The attempted tackler appeared to show no pain, even though he was badly shaken. (22 April 2018, Iron Warriors vs Dublin J)

Contextually in elite rugby, “shut up” referred to a directive to stop complaining about pain, and “get up” referred to a directive to continue playing. In addition to the inherent risk of rugby, the “shut up and get up” behaviors can inevitably aggravate the risk when an injured player “shuts up” about pain symptoms and “gets up” to continue playing. Especially for severe injuries as concussion aforementioned, a player may miss the best treatment window as recent studies demonstrated (Beakey, Tiernan and Collins, 2016; Reid et al., 2019; Sye, Sullivan and McCrory, 2006).

In parallel from an OSH perspective in other high risk occupations, if employees were encouraged by management to “not show fear” at a workplace, it would indicate a negative



safety culture in that organization that needs significant enhancement (Kines et al., 2011). In OSH management, leadership plays a vital role in influencing the development of safety culture (Wu, Lin and Shiau, 2010). In rugby, coaching staff as the leader role should foster a positive safety culture by encouraging open and honest reporting / feedback about injuries through formal or informal means. It may still take a long time for players to feel comfortable to openly communicate pain and injury due to the dominance of toughness culture in rugby (Star, 1999). A positive safety culture as the premise of effective health risk management (Kim, Park and Park, 2016) while creating an environment that allows every player to talk about their perceived risks could be the beginning point in the unique occupational setting rugby presents.

“Tackle! Tackle! Super Hit!”

As rugby is a team sport, players often need to confront pressure from teammates. Even during training sessions, teammates become dissatisfied with players who do not perform to their optimum:

One player failed to take a pass from his teammate. The ball was dropped and bounced far away from him. The player chased the ball while other players watched his actions and hissed. (29 August 2017, Iron Warriors Rugby Training)

Though this note described only a training drill, rather than an actual game incident, teammates still showed their disappointment when the player lost possession of the ball. Teammates’ behaviors pressurize players, as do the attitudes of coaches and management within the club. A coach’s comments can directly influence players’ attitudes. For instance:

A ball-carrier tried to break the tackle of two players during a tackle drill. When the player was tackled, the coach shouted, “Lovely! Lovely!” Though I might personally fail to comprehend any link between the adjective “lovely” and a tackled player falling heavily to the ground. (26 September 2017, Iron Warriors training)

This comment demonstrates the coach’s satisfaction during the drill for this risky behavior. Naturally, coaches used a lot of words to motivate players during training:

8:00 pm. It started raining, but training continued. A group was divided into 10 players to a team; among those, 5 were attackers and 5 were defenders. Players shouted, “Ready? Ready? Go!” Coach: “Too easy! Harder! Harder! Pressure! Press! Push!” Players ran faster and repeated: “Push! Push!” Some players fell due to collisions. Coach: “Well done! Let’s go! Let’s go!” Coach also called the players’ names. A severe collision occurred, and the ball flew far away. (24 August 2017, Iron Warriors training)



The scene above was very common to observe. As I previously mentioned, I believed coaching staff would not encourage players to perform risky behaviors as Physio A told me. However, when the risky behaviors were embedded in rugby performances, that was another story. Naturally enough, the rate of injury increases if players are moving at greater speeds (Targett, 1998). The divergence between what I was told and what I observed about coaching staff attitude towards player safety became more obvious after I interviewed Physio B.

They probably would not use harsh words directly, but you can get the message in the conversation. You may have a manager who is particularly hard on you, and you just say he's a tough guy to play for, which you can take more than one meaning from. Later, when sitting in their rooms and seeing what a fantastic manager he is at the end of it, you can see how much pressure some lads can be put under, especially some of the top players who bear all the pressures from the team. You don't hear it directly, but you can know some pressure there that's really affecting them, real pressure. (Physio B)

Physio B believed more than just language was used by coaches to make their point, so players could feel the pressure even if the coach did not say anything. Previous studies have found that pressure from coaches has a significant impact on players' behavior (Anshel and Eom, 2003). Similarly, opposition spectators who were not part of the club or team also expected to see an exciting, physical game of rugby. I always heard spectators shouting during competitive games:

There were 16 minutes before the game ended. Another scrum was called by the referee. Spectators shouted, "Get the ball!" Meanwhile, the Iron Warriors ball-carriers were tackled many times by the opposing team. Then another cry came from the spectators, "Tackle! Tackle! Super hit!" (22 April 2018, Iron Warriors vs Dublin J)

Spectators have a higher injury acceptance level than the actual players (Fuller and Ward, 2008). Similarly, in a competitive and exciting game, spectators also accepted the risk that may incur to players by a "super hit":

An opposing player lay on the pitch. Two medical staff from their team attended to him and helped him sit up. It seemed that his neck was injured. The medics checked him, then he stood up. People clapped when he walked off the pitch. (29 April 2018 Iron Warriors vs Dublin M)

Spectators' reactions may directly encourage players to take risks in competitive games that reflect demands for a more exciting performance. The harsh expectations or demands that players perceive could influence them and exert constant pressure, thus adversely affecting their behaviors (Weiten, 1998). As the only arbitrator in a competitive game, the referee is the first person who could stop a game if players faced significant risk (Gianotti et al., 2009).



One simple example was when the referee prevented a scrum before it collapsed, by adjusting players' scrummaging positions:

Players from both sides crouched prior to engagement. They got their scrummaging positions ready. The referee waved his hands to ask them to stop and stand up. He readjusted their positions, then they engaged the opposition (29 April 2018, Iron Warriors vs Dublin M).

Furthermore, spectators' behaviors may influence players' health and safety by putting pressure on the referee. As I observed, the behavior of a rugby referee could potentially be influenced by spectators' comments:

Spectators shouted together, "Ref! Ref!" Then they stopped for a second. "F*** (expletive)!" A voice from the audience was heard, and people laughed. The referee came to the assistant referee, talking about something. Then he went back to the pitch, holding up one of his arms. The spectators applauded. (29 April 2018 Iron Warriors vs Dublin M)

On a number of occasions, I observed spectators displaying their anger by shouting at a referee. Referees are trained for, and used to spectators getting angry; thus, it could be argued that it affects their decisions very little. Additional research is warranted to explore what impact, if any, spectators may influence referees' decisions.

In many countries, the ideal image of a rugby player should be a person who is masculine, muscular, agile, tough, fearless of pain, persistent, never give-up, striving for excellence, winning, individual and team competition, and materialism etc. (Pringle and Markula, 2005; Harris and Clayton, 2007; Fenton and Pitter, 2010). The public are expecting these types of sportsperson characteristics, most of which can be observed from players' risk-taking behaviors during the game. As a result, people's encouraging reactions such as respect and compliment to the risk-taking behaviors will in turn intensifying the players' intention of leaving the favorable image. Meanwhile, players are influenced and encouraged by social expectations of stakeholders both inside and outside the club or organization to accept the physical nature of rugby, resonated with the influence of "sportsnets" (Nixon, 1992) in sports literature.

In summary, the risk factors cannot be simply attributed to players alone or certain stakeholders, since the behaviors of different stakeholders were continuously interacting, or interacted, finally ending with pressure on players which could negative impact health and safety. From an OSH perspective, the focus in such a context should be again drawn on the organizational safety culture (Haukelid, 2008) as the first step. When a positive safety culture (Guldenmund, 2000; Zwetsloot et al., 2017) is gradually cultivated within the organization, the positive impact for a rugby organization branded with being highly responsible for player wellbeing can then subsequently influence the local community and even the "sportsnets" in the society. Thus, the key personnel will be the management staff (Flin and Yule, 2004;



Kines et al., 2011) because of their dual roles of both superiors and influential spectators closely interacting with the players.

Risk Control in Rugby

“We Are All Made of Steel!”

Sometimes, injured players from the opposing team talked to me when I observed Iron Warriors’ competitive games. Perhaps because of my outsider status, they sometimes did not take my questions seriously:

I asked him (a Dublin K player sitting on the same table with me) whether he’d been injured before. He laughed, and answered “Never”. He continued: “I’ve played rugby for 15 years, never been injured. I’m made of steel!” He told me proudly, “No one in this club had ever [been] injured! We are all made of steel!” (14 April 2018 Iron Warriors vs Dublin K)

The players’ response was contrasted significantly what I observed either during training or during competitions. In addition to the existing injury data in rugby, I knew the player was joking; however, the joke might reflect an underlying desire to strengthen their perceptions of themselves to be as strong as steel, to decrease the possibility of being injured or a lack of willingness to admit weakness. Traditionally, injury and illness prevention has been a coach’s responsibility (Gianotti, Quarrie, and Hume, 2009); however, to avoid injury, players need adequate technical skills and the ability to compete at the required level of play. For example, in a scrum, where the forwards from opposing teams compete for possession of the ball, there is considerable effort exerted in pushing against each other (Milburn, 1993), as I observed during one training session:

One team crouched in scrum formation against a scrummaging machine. Another team stood on the machine for extra opposition. The players in the scrummaging team drove several scrums until the coach asked them to stop. Sometimes the machinery could move upwards; the coach usually called “Stop!” and let the scrum players know. Each time when the machinery was pushed for a distance, the players on the machinery clapped for them. (12 September 2017, Iron Warriors training)

For individual players, the use of PPE has been advised to protect them from injuries. However, I observed players did not always use mouthguards:

There were not too many players wearing mouthguards, so I mentioned it to Physio L. Management F said the policy kept changing, so they were not sure at this moment whether a mouthguard was a must, according to the policy. “Players really don’t like it. They hate it!” Said Management F. (12 November 2017, Iron Warriors vs Dublin Q)



Management F used the word “hate” very emphatically. This was not surprising, as players may avoid using mouthguards for various reasons, such as discomfort when closing one’s lips, problems breathing, and issues with swallowing (Boffano et al., 2012).

Upon consideration of the current risk control in rugby from an OSH management perspective, the levels of control measures (Health and Safety Authority, 2017) engaged in rugby from my observation were limited to administrative control and PPE usage. The administrative control is to reduce the potential for harm and/or adverse health effects by providing people with appropriate training (Health and Safety Authority, 2017). Rugby training equipped players with high levels of strength, power, and the appropriate metabolic conditioning to perform in the most time-efficient manner (Gamble, 2004). Coaches and strength-and-conditioning experts were there to ensure players had the capacity to reduce the harm in performance. This is important as observed, because rugby is based on teamwork, and if one player is not sufficiently trained, he may contribute to another player’s injury. Sport research has linked safety with technique, supporting evidence that most intervention programs incorporating safe techniques are effective (Gianotti, Quarrie and Hume, 2009). PPE usage, such as mouthguard use, is the least preferred measure in OSH since it is the last line of defense.

The most preferred control measure is risk elimination (Health and Safety Authority, 2017) which seemed impossible under the current rugby rule. However, as COVID-19 pandemic aggregated the risk of the overall environment (Falvey, Mathema, Horgan and Raftery, 2020), the authority may consider to create a new variant of the game for eliminating the risk. The second preferred control measure is risk substitution (Health and Safety Authority, 2017), which have the potential to be implemented by educating players to concern other players’ safety. As aforementioned, compared with the non-sport industries, hazards in elite rugby should be identified considering the uniqueness of the context. Specifically, in the rugby pitch environment, the players themselves can be considered as the hazard to their opposition players and the risks arising are from the interaction between the two cohorts. If all players were aware of the long-term health implications from short term injuries arising from tackling behaviors and if as a consequence all players reduced their safety misconducts, the risk impact result from violent tackles will be substituted by less violent ones, the benefits of which would be significant for all players in the pitch especially the opposition players (C.W. Fuller et al., 2010). However, this requires a high level of collective safety awareness and safety ethics. To what extent players are willing to prioritize other players’ safety requires more research in the future.

“No One Is Going to Die If You Lose the Game”

During the interview with Physio A, he emphasized the importance of post-injury practices, especially removing the suspected concussed player from the pitch:



[If a player] got a concussion and had a brain injury or died, it would be the responsibility of the physio, not the coach. You know that person [the physio] will be automatically in trouble. I always communicate with the younger physios; if you're unsure on something, if you [are in] doubt [of] the player's status, take them off. No one is going to die if you lose the game. (Physio A)

Obviously, if an injured player is replaced on the pitch, the team may lose the game; however, as stated, "no one is going to die". The attitude that players' safety was more important than performance from a medical perspective aligned with my observation that medical staff always immediately took actions when players were injured. However, over the course of two interviews, it became apparent that, during treatment, players always asked medical staff when they could return to play:

Say someone has a shoulder, shoulder problems, I say three weeks. And they ask if there is any chance to... [return to play earlier]. And I just tell them what most rehab goes, and if they had a better education, they won't waste time. (Physio C)

I guess you have to educate them of the, on the severity so either it is a severe injury or not severe. And then I guess you try to make a plan and give them a rough line as early [as possible]. [Because] it is difficult to tell early; if they are on the first session when they go back, it could be six weeks, it could be two weeks. (Physio B)

From the physiotherapists' comments above, it can be observed that a complete injury impact control process required medical prognosis and players' dedication to the rehabilitation process. Medical staff were not only responsible for treating injuries but also needed to educate players on OSH awareness. Moreover, the communication of players' health and safety between the two groups of medical staff was viewed as crucial. Physio C had never witnessed a serious concussion, which could have been alleviated by effective communication:

So, there is one medical staff for the first game, in which a player was injured. The message didn't get relayed. Or maybe they don't even know he's hurt. And he went out and played the following week, and he sustained the concussion. And uh...it's in about half way... he couldn't, couldn't stand, that's the most serious I've seen. (Physio C)

Obviously, the player referred to above by Physio C ignored his responsibility to update the medical staff about his situation. Implicit in this players' decision is the difficulty in balancing his willingness to win a game and his safety awareness.

During my observational period, current risk control measures in rugby can be categorized into risk prevention and risk impact control. OSH practices require a collaboration between players and support staff to minimize risk impact. Specifically, an injured player needs to



adhere to a strict protocol, including stop playing, report the injury, obey the prognosis, and undergo proper rehabilitation. Meanwhile, medical staff need to treat the injured player in time, provide a rehabilitation plan, and educate the player if necessary. The core ethos is to keep in mind that “no one is going to die if you lose the game”, which means safety should be prioritized comparing to performance if accidents occur. Usually, medical staff have no doubt about player safety priority, which aligns with their responsibility of curing the player. Nevertheless, coaching staff and players themselves need to prioritize their health and safety to the same level as they prioritize winning especially if accidents occur – a healthy injury free team that has an educated awareness of the risks they face has the potential to be a highly successful one. Aligned with suggestions in previous sections, a positive safety culture within the team can lead to improvements in many ways within a team including trust issues relating to transparency in communication, trust in leadership, trust in players to be aware of the risks to themselves and to others and that while winning is the priority it can be done in as safe a manner as the unique rugby environment can allow. Such a shift in rugby organization culture needs the support from management staff especially coaching staff to encourage and educate players to either communicate safety concerns informally or report safety issues in a formal way and to recognize that as a whole team the safety and health of one individual has repercussions for the performance of the whole team.

Limitations

In terms of limitations, observing without participating may not lend itself to one’s complete understanding of an activity (Burgess, 1984). However, being a member of the studied group is neither necessary nor sufficient for being able to “know” the experience of that group or facilitate knowledge of the group (Fay, 1996). Moreover, outsiders might more adequately conceptualize the experience, and often others external to the experience might be able to appreciate a wider perspective, with connections, causal patterns, and influences, compared to one internal to the experience (Dwyer and Buckle, 2009). Certainly, a researcher’s identity and theoretical approach may impact observation, analysis, and interpretation (Kawulich, 2005). The first author, as the principal research tool (Allen, 2004), reflected on her identity (gender and ethnicity) and outsider status during data collection (e.g. reflective logbook) and analysis. This outsider status was challenged by the second and fourth authors to consider additional or alternative insights. While acknowledging reasons for and limitations of insider research, we engaged with the advantages of outsider or etic perspectives. Specifically, this identity and status allowed for exploring aspects of elite rugby from an alternative, etic perspective. The first authors’ interpretation of observations highlighted the competitive, physical, and aggressive behaviors in elite rugby. As a female initiated with outsider status, her knowledge construction was challenged by her co-authors, two of whom had experience conducting research in male-dominated competitive sports.

Conclusion

In conclusion, as illustrated in Table 1, risk identification awareness in elite rugby requires to be enhanced since the risk tends to be underestimated in the context. Rugby players’



aggressive performances and social exposure to stakeholders inside and outside the organization may aggregate those risks. The influence of a rugby toughness culture entrenched in the macro sport context may not disappear in a short term, but player safety behaviors can potentially be influenced by a positive safety culture developed within the organization through the simple initiation of openly communicating safety issues and what the long-term implications of injuries arising from a lack of safety control practices can have in the future.

Implementation of safety practices for risk prevention and risk impact control in rugby also can be improved through control measures such as PPE use and injury reporting, which reflect a conflict between safety priority and performance priority in rugby context. This dilemma can also be resolved through safety culture cultivation via collaboration between players and support staff. Such a collaborative relationship is at the core of OSH management practices (Kines et al., 2011), and improves organizational communication while fostering a partnership that can in itself be a control (risk reduction) measure and improve the safety climate of an organization, for all its employees and stakeholders. As mentioned previously, using critical realism as a philosophical guidance, this study provides an understanding of safety awareness in elite rugby in relation to the causal mechanisms of risk management by contrasting different data sources (e.g. what was observed in the field and what was reported by interviewees). Considering the occurrences may be different from what is empirically observed, we also acknowledge that all findings in this study are treated as fallible aligned with critical realism stance.

Currently, elite rugby is a game of near-misses, maintaining a balance between safety, competitive performance, and excitement. Given that competitive performance and excitement are indispensable elements of rugby, safety may not always be prioritized, though that may be changing, as shown by recent legal changes. For example, World Rugby has adopted the regulation requiring players of all levels to wear adequate equipment such as mouthguards during training and competition. One potential implication of this study is that safety-related risks within rugby could be reduced by improving safety awareness which, in turn, could reduce the impact of injuries.

Additionally, further research could assist in dealing with questions that arose from this study. For example, what are the main indicators of safety awareness in an elite rugby context, and how can we evaluate rugby players' risk-acceptance level? In response, data gathered from interviews and questionnaires with players are suggested to further facilitate the evaluation of risk awareness and personal perceptions of long-term health and well-being, to ascertain potential risk control measures specific to elite rugby. Finally, further research utilizing similar methods should be conducted for elite rugby in other countries that are seeing it rise in popularity, in order to ascertain variation in cultural contexts. This research could also be applied to other high-risk team sports (e.g. American football, Australian rules football, ice hockey, etc.), to consider variability in those sporting contexts.



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