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“Is the focus in professional rugby ever really on health?”: a qualitative study on the uptake of illness prevention guidelines in rugby

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Abstract

Illness prevention is essential for athlete health management, but little is known about its uptake in sport. Prior to the pandemic, the International Olympic Committee (IOC) published a consensus statement recommending illness prevention guidelines are implemented in sports. Yet, little is known about guideline uptake. Therefore, this study aimed to explore the (1) illness experiences of rugby players and athlete support personnel and (2) barriers and enablers to illness prevention guideline uptake in rugby, using the lens of behaviour change theory. In a bid to inform and enhance athlete welfare, we sought to amplify the voices of participants through qualitative inquiry. Between August 2020 and May 2021, 16 semi-structured interviews were undertaken with players and athlete support personnel working across rugby. Analysis was conducted using Braun and Clarke's reflexive thematic analysis. Prior to COVID-19, participants deemed illness to be of little concern, with experience of illnesses and the global pandemic critical enablers to guideline uptake. The rugby environment was a barrier to illness prevention, particularly in women's and academy teams where resource deficiency was highlighted. 'Rugby identity' acted as both a barrier and enabler with participants' passion for rugby driving both guideline adherence and non-adherence. Tackling resource inequalities between men's and women's cohorts is critical to effectively implement guidelines. Coach and player education is essential, and emphasis must be placed on continuing preventative behaviours adopted due to COVID-19. Our findings offer new insight into illness prevention, moving away from prevailing quantitative research, and instead voicing players' experiences.

Key Words

Illness; Athletes; Rugby; Behaviour Change; COVID-19; Illness Prevention

Introduction

Protecting athlete health has become a major priority in sport in the last decade (Engebretsen et al., 2014). Both injury and illness play major roles in athlete health, however the latter has only recently become a focus of surveillance and monitoring (Bahr et al., 2020). With upper respiratory illnesses being the most common reason for non-injury related presentation at sports medicine clinics (Gleeson & Pyne, 2016), short-term physical illnesses, such as those affecting the dermatological, gastrointestinal and respiratory systems present a significant health burden to athletes (Ray-Smith & Drew, 2016). Furthermore, little is known about the lived experience of those navigating illness in sporting contexts compared to that of injury. This is perhaps surprising, as illnesses, unlike injuries, pose a transmission risk between individuals. Studies evidencing the consequences of illness within sport have noted that distance running race completion is 2 – 3 times less likely for endurance athletes starting with systemic illness symptoms (Van Tonder et al., 2016). Within the context of rugby league, academy players reported loss of body mass and sleep disturbances due to illness (Chesson et al., 2020) and senior professional rugby league players have been shown to play whilst having COVID-19, due to the asymptomatic nature of the virus (Jones, Phillips, Kemp, et al., 2021). Despite quantitative evidence highlighting the detrimental effect of illness within sport, qualitative inquiry into the lived experience of illness amongst athletes, and specifically those from rugby, is absent from the literature. As noted by Bekker et al. (2020), exploring athlete and stakeholder experiences may help to improve athlete health protection.

Rugby codes (i.e., rugby union, rugby league, rugby sevens) offer a compounded environment for illness risk for several reasons. Athletes experience frequent close-proximity skin-to-skin, and face-to-face interactions with teammates and the opposition, and share changing rooms and training facilities, which may provide a vector for transmission. Rugby athletes also commonly share towels and water bottles (Davies et al., 2017; Keaney et al., 2018; Stacey & Atkins, 2000), despite guidelines suggesting these behaviours should be avoided to limit risk of illness (Schwellnus et al., 2016). Moreover, full-contact football code athletes are most affected by respiratory system illnesses (Chesson et al., 2021)

and during pre-season periods approximately 20 – 50% of elite rugby players experience at least one illness (Cunniffe et al., 2011; Keaney et al., 2021; Thornton et al., 2016; Tiernan et al., 2020).

Recognising the importance of illness prevention in sport, the International Olympic Committee (IOC) developed expert consensus statement guidelines (Schwellnus et al., 2016) for use by athletes and support staff, including medical staff, coaches and practitioners. Few studies have assessed the perceptions and use of IOC guidelines (Badenhorst, Fortington, Bolling, Pasanen, et al., 2021; Badenhorst, Fortington, Bolling, Verhagen, et al., 2021; Finch et al., 2021; Fortington, Badenhorst, et al., 2021; Fortington, Morgan, et al., 2021), however these were not specific to illness prevention guidelines and little is known about the methodological aspects of these studies (as they were published as abstracts). Despite outlining that medical staff should “*develop, implement and monitor illness prevention guidelines for athletes and medical and administrative support staff*” (Schwellnus et al., 2016, p. 1049), little is known about the uptake and adoption of these guidelines in practice. Athlete experiences and perceptions should shape the development of athlete health protection strategies, and calls for routine incorporation of implementation and behavioural science into research of prevention strategies have been made to improve athlete health management (Finch et al., 2017). At the core of implementation science is the identification of the barriers and enablers to guideline uptake across multiple levels of context (Bauer & Kirchner, 2020). With limited research exploring the uptake of illness prevention guidelines across any sport, from the perspective of those most affected, there is a need to elevate the voices and experiences of players and athlete support personnel (ASP), such as coaches, medical and sport science support staff. All rugby codes were included as part of this study due to the limited research undertaken in the field.

When considering the uptake of illness preventing behaviours and guidelines, it is important to move beyond the focus on guideline knowledge, and instead recognise that multiple factors influence human behaviour. Frameworks like the Capability, Opportunity, Motivation Behaviour (COM-B) model (Michie et al., 2011) acknowledge that behaviour is part of an interacting system, influenced by an individual’s social and physical environments, as well as their capabilities and motivations (Michie et

al., 2011). In order for an individual to adopt, sustain or change a behaviour they must have the capability, opportunity and motivation to do so (Michie et al., 2011). Capability can be psychological (knowledge) or physical (skills); opportunity can be social (societal influences) or physical (environmental resources) and motivation can be automatic (emotional) or reflective (beliefs/intentions) (Michie et al., 2011) (Figure 1). In the context of sport, the COM-B model has been successfully used to understand asthma medication use in athletes (Allen et al., 2022) and address the barriers and facilitators to nutritional adherence in elite athletes (Bentley et al., 2019; Bentley et al., 2021).

****INSERT FIGURE 1 HERE** (IN COLOUR)**

Identifying factors affecting uptake requires a behavioural approach and exploring the barriers and enablers to guideline uptake will provide deeper understanding of how these are currently being used, if at all. Contextual factors play a vital role in how quickly innovations become used (Bauer & Kirchner, 2020), therefore, it is important to explore the experiences of all stakeholders in the social setting. Furthermore, different perspectives surrounding injury and illness in sport arise from varying beliefs and assumptions, which shape the way that an individual will behave (Bolling et al., 2018). Our goal was to advance what is known about the uptake of illness prevention guidelines by those most affected by them, to help protect athlete health and wellbeing, and optimise performance. Therefore, this study sought to 1) explore the illness experiences of rugby players and ASP, and 2) use the lens of behaviour change theory (i.e., COM-B and TDF) to identify the factors that enable or act as barriers to the uptake of evidence-based illness prevention guidelines in rugby. This behaviourally informed approach guided the practical implications of the study.

Materials and Methods

Philosophical Stance

To address the study's research aims, a qualitative approach was used. Qualitative research enables detailed, wide-ranging conversations with participants and is crucial for exploring and understanding the meanings that individuals or groups ascribe to social or human problems (Creswell & Creswell,

2018). In a bid to move the field of illness prevention beyond the dominant quantitative research designs, we sought to amplify the voices of participants, shape theory and practice, and drive change to enhance and improve athlete welfare through qualitative inquiry. The current study was conducted from an interpretivist philosophical position, which emphasises the understanding and meaning people (in the case of this study, rugby players and their ASP) create for and attribute to their experiences (Hackfort & Schinke, 2020; Poucher et al., 2020). This interpretivist stance is underpinned by our relativist ontology and subjective epistemology. As reflexive researcher-practitioners, we acknowledge the connection between ourselves and the study in a subject-to-subject relationship (Sparkes & Smith, 2014). Further, we recognise that our roles and experiences influence our interpretation of the data, and we are co-creators of knowledge within the interviews (Sparkes & Smith, 2014).

Participants and Recruitment

A purposive sampling approach was undertaken to identify rugby players and ASP who were actively working or playing in an elite rugby environment (i.e., rugby union, rugby league or rugby sevens), at regional to international-level. We drew upon the continuum of Swann et al. (2015) who defined athlete “eliteness” as a wide-range of standards affected by both inter- and intra-sport factors. Athlete support personnel included coaches, both head and assistant who provided skill-based rugby coaching, medical staff (i.e., doctors, physios, and sports therapists) and sports science support staff (i.e., sports scientists, nutritionists, strength and conditioning coaches, psychologists, and welfare support). Participants were recruited through emails and those purposively sampled were asked to refer others working or playing within the desired setting (snowball sampling). It was understood that ASP may have previously been players, therefore reflecting upon their own practices was encouraged to elicit broader views of changes in practices over time. It was also acknowledged that ASP may not work solely within rugby, therefore participants were asked to reflect on variation in practices across sports they supported to initiate further reflection. All quotes and experiences depicted reflect only those from a rugby setting. Ethical approval was granted by (institution will be added after blind peer review) Research Ethics Committee and all participants provided written informed consent in advance of the research being undertaken.

Sample Characteristics

Sixteen participants (female $n = 6$ and male $n = 10$) were recruited. All participants were working or playing within UK rugby contexts. All participants were either working or playing in solely elite rugby union ($n = 3$) or rugby league ($n = 7$), with some participants working and playing across multiple codes including league and union ($n = 4$), and union and sevens ($n = 2$). Participants worked or played across men's ($n = 10$) and women's rugby ($n = 4$) with two participants working or playing across both the men's and women's game. Athlete support personnel accounted for 56% of the participant sample ($n = 9$), followed by players ($n = 6$); one participant held roles as both ASP and player. Further participant details are available in supplementary material 1.

Procedure and Setting

A semi-structured interview guide with open-ended questions was developed by authors LC and SB, to address the research aims. To ensure the broadest range of factors influencing illness prevention were considered, the interview questions were guided by the COM-B model (Michie et al., 2011). Additional interview prompts were supported by the Theoretical Domains Framework (TDF) (Cane et al., 2012). Two to three questions were developed per domain with additional prompts used if further clarification was required. After initial questions, participants were provided with a copy of the IOC illness prevention general guidelines from summary box 1 (Schwellnus et al., 2016). Participants were asked to read the guidelines in full, before further questions were asked relating to these. The semi-structured interview guide consisted of: 1) rapport building questions (*e.g. can you talk me through your experiences playing/working in rugby?*); 2) transition questions (*e.g. please can you share with me your experiences of illness during your career or time working in sport*); 3) illness prevention – pre-guideline administering (*e.g. are you aware of any or use any illness prevention guidelines in your sport or as part of your practice?*); 4) illness prevention – post-guideline administering (*e.g. what skills do you think are required to implement the guidelines in practice?*); 5) concluding questions for participants to share any further information. Two pilot interviews took place with members of the target participant population, as recommended by Sparkes and Smith (2014), to give feedback on questions and to practice

using the interview guide. From these pilot interviews, issues regarding questions or probes were examined and adapted; greater clarity was required on pre- and post-COVID experiences, therefore prompting for reflection and specific probes to time points were added. Audio recordings were reviewed by SB to help develop the lead author's (LC) interviewing technique. For example, early in the interviewing process, LC was encouraged to pause before asking follow-up questions, to create space for the participant to offer additional insights. Probing techniques were also discussed to help LC generate richer accounts.

All semi-structured interviews were facilitated by one interviewer (LC) who underwent post-graduate training in qualitative research. As an 'insider' in the rugby context, working as a nutrition practitioner, the first author was already familiar to some participants and therefore was able to build rapport. LC's knowledge of training and competition environments promoted free-flowing interviews in which sensitive issues were tackled in a natural and candid way. The use of reflexive memo writing throughout the research process reduced the risks of researcher status causing power differentials, assumed understanding and to support the interviewer in managing emotional burden. Consent forms were administered and signed prior to interviews. The average length of interviews was 50 minutes (range; 21 – 99) and took place between August 2020 and May 2021. Undertaken throughout the COVID-19 pandemic during national lockdowns, in-person contact and travel restrictions necessitated the use of online interviews. Three interviews were conducted face-to-face, and thirteen were conducted using synchronous online interviewing (Sparkes & Smith, 2014) via Microsoft Teams. Synchronous online interviewing provides a platform to undertake in-depth qualitative research when travel or other restrictions mean face-to-face is not possible (Sparkes & Smith, 2014).

Data Analysis

Participant interviews were audio recorded and transcribed verbatim by LC using Microsoft Word. Reflexive thematic analysis was selected as the analytical approach, and the raw data were coded using the six stage process (Braun & Clarke, 2019). These stages included: 1) immersion, 2) generating initial codes, 3) generating and identifying themes, 4) reviewing themes, 5) defining and naming themes and

6) writing the report. During the immersion stage (stage 1), LC read and re-read transcripts, took notes on points of interest, and listened to audio recordings to become familiar with the data set. Throughout the analysis process, SB acted as a critical friend to discuss study reflections and interpretations. Stage two, generating initial codes, involved a recursive approach (Braun & Clarke, 2019), repeating the coding of transcripts from creating broad descriptors to developing refined codes. During the initial stages of stage 3 (generating and identifying themes), the researchers returned to stage two (generating initial codes) to further specify codes which were initially too broad. This process was fluid and recursive, a trait outlined by Braun and Clarke (2019) in their reflection upon reflexive thematic analysis. As the interview guide was informed by the TDF (Cane et al., 2012) and COM-B model (Michie et al., 2011), a combination of inductive and deductive approaches to analysis were implemented. Initial coding was undertaken in an inductive and open manner, to allow for the codes and themes to be grounded within the data. Coding was undertaken at both the semantic and latent level, encompassing not only what has been explicitly expressed by participants, but also interpreted to go beyond description to understanding the barriers and facilitators of the behaviour. As we were committed to exploring the broadest range of influences and to develop a more creative and inductive approach, transcripts were hand annotated to avoid constraining the coding process. Additionally, access to previous codes from other transcripts was restricted until final computer input to ensure that a deductive, *'fitting it into what is already there'* process was limited. Codes were grouped into themes, which represent a "central organising concept". During stage 4 (reviewing themes), themes were viewed as a whole data set, and reflection from themes to individual data items was undertaken to ensure themes were representative of the data set's patterned meaning. The themes were mapped to the three domains of the COM-B model: capability, opportunity and motivation. During the theme refinement stage (stage 5), LC and SB met regularly, with SB acting as a critical friend in the development of themes. LC and SB also discussed the development of the themes with other researchers in the team, to bring new ideas and perspectives into the analysis process. Sub-themes and patterned meaning were reviewed in the formation of themes, and multiple iterations were developed, with this process continuing into the write up phase (stage 6). Following analysis, we applied the Theoretical Domains Framework (TDF) (Cane et al., 2012), which allows the mapping of specific processes identified by the COM-B model to types

of interventions that change behaviour. This allowed us to identify potential interventions that could address the identified barriers and enablers.

Criteria for judging the quality of research

In line with our interpretative philosophical position, a relativist approach (Sparkes & Smith, 2009) can be used to judge the quality of the current work. Throughout the research process, supporting ‘critical friends’ (Smith & McGannon, 2018) were utilised to provide a reflective sounding board and to challenge the study interpretations (Sparkes & Smith, 2014). Our research worthiness can be judged by its timeliness and relevancy. With illness prevention of significant importance at the time of data collection due to the study’s context during the COVID-19 pandemic, participants were immersed within sporting environments that were introducing and adapting illness prevention protocols. Many of the accounts captured included participants’ reflections back to a time ‘pre-COVID’. As researchers, we acknowledge the incomprehensible effect the COVID-19 pandemic has had on the global population and recognise the significance and originality of the research at this time. Furthermore, LC worked as an applied research practitioner in a rugby setting throughout the study, witnessing and observing behaviours undertaken within environments such as those explored in the current study. Rich rigour was ensured by recruiting information-rich participants actively engaged in the rugby environments being studied, generating a rich understanding of the phenomenon of interest.

Findings and Discussion

The aim of the study was to explore the illness experiences of players and ASP and explore the barriers and enablers to the uptake of illness prevention guidelines in rugby. After a back-and-forth process reviewing codes and sub-themes, and drawing upon their patterned meaning across the data set, five themes were generated: (1) ‘Is the focus in professional rugby really ever on health?’ (represents the low concern of illness and low priority of illness prevention in rugby); (2) ‘It’s not an issue, until you get ill... then your behaviour might change’ (reports the experiences and consequences of illness through the eyes of all participants and how these experiences of illness shape behaviours and perceptions towards it); (3) ‘The rugby identity: a powerful force’ (captures the motivation and drivers

for up taking illness prevention guidelines, focused on the importance of rugby identity to players and ASP); (4) ‘COVID-19: a pivotal point in illness prevention and protective behaviours’ (captures the impact COVID-19 has had on players and their training and competition environments, sparking changes in behaviour, and generating action through the implementation of illness prevention strategies) and (5) ‘The rugby environment: ill-equipped for illness prevention’ (centres around the barriers faced to implement illness prevention guidelines within the rugby environment). Summarised in the thematic map (Figure 2), these themes will be illustrated through participants’ direct quotes. Throughout, pseudonyms have been used to protect the participants’ identity.

****INSERT FIGURE 2 HERE** (IN COLOUR)**

A key observation across the data set was the lack of knowledge of illness prevention guidelines for sport; only one ASP participant was able to identify the origin of the sport-specific guidelines. Many participants identified prevention strategies that were present within the guidelines, (e.g., washing hands and managing training load), however awareness of guidelines was limited to this. Regardless of preceding knowledge, all participants were asked to read the guidelines during the interview to foster discussion.

“Is the focus in professional rugby really ever on health?”

Within this theme participants shared a common message that illness and illness prevention have historically not been a concern in athlete health management and furthermore, not a priority, as Mason, academy strength and conditioning coach, summarises: *‘illness is not part of the conversation...at all, to my knowledge [and] experience...it’s not really talked about’*. A temporal dimension was also identified in relation to illness, with comments such as players being ‘too young to care’ about illness, and a link between increased age and increased priority of illness raised by participants. Senior players (e.g., those no longer in the academy) were deemed to be more ‘conscious’ and focused on illness, compared to younger players. For example, Hannah, an international rugby player, illustrated this perspective when describing the experience of training with younger players:

I don't think they [the younger players] really think twice about it...but they're probably the kind of super carriers of illnesses because, they kind of interact with so many people, in comparison to us old, boring non-social people [laughs], and obviously they're [sic] kind of like- go out in clubs and stuff like that a lot more than we do, so, I would say the younger kind of group are probably less aware of illness, compared to those of us who are kind of a bit older and more conscious of, of things like that and behaviours that go with it

Some ASP seemed to 'wash their hands of the illness problem', so much that they articulated a view that illness was not their problem, often referring it to the medical-specific ASP to manage. The challenge of multi-disciplinary team (MDT) working and potential diffusion of responsibility is illustrated by this quote by Mark, a first team sport scientist.

it's a little bit tricky...because you are working within a multi-disciplinary team and because you're not fully aware of everybody's role as staff members within that multi-disciplinary team you almost assume that this sort of responsibility is taken on by the- specifically the medical staff...and you almost assume that the doctors take responsibility for that

To promote shared responsibility of illness prevention within the rugby context, it is essential that clear MDT roles and responsibilities are established and reinforced, to ensure individuals understand how their behaviours are critical when it comes to illness prevention guideline implementation and adherence. Recent research into injury prevention also echoes these rugby context notions. Expressions of requirement for a team approach and joint MDT responsibility was raised in recent literature exploring the perspectives of injury prevention in elite athletes and ASP (Bolling et al., 2020). Furthermore, a systems-thinking approach and call to action by Mooney et al. (2017) outlined a clear need for MDTs to work cohesively in athlete health management, raising notions that the health and success of athletes is the interdependent responsibility of coaches, performance staff, medical staff and the athlete themselves. Earlier work by Dijkstra et al. (2014) highlighted the success of the 'integrated performance system' in UK Athletics where all disciplines work alongside one another cohesively to manage illness and injury. However much work still needs to be done to ensure unified working across MDTs in rugby and fostering of shared responsibility of athlete health protection.

The greater focus on performance and injury over illness was an evident barrier to illness prevention, with participants arguing that players' bodies are placed on the line in the name of performance, irrespective of their health status. Caleb, a strength and conditioning coach notes that 'week in-week out' performances are a priority and asks questions about the focus of rugby. He reflects:

is the focus in professional rugby...really ever on health? Like you got players every week running and smashing each other, walking off with shoulders hanging out [of] sockets, like knees ruined and they'll just get taped up the next week and play...the focus is very much on performance as a whole rather than health

Kerry, an international rugby coach and ex-international player acknowledged that coaches do have an awareness of illness and its impact on players, but coach opinions on the severity of an illness may override player welfare and health decisions:

how bad is the illness because if it was a cold or feeling like quite under the weather ... if a player's played at training all year round to play in this world cup, are you gonna [sic] stop them playing because of a cold- when they might only achieve their sort of 70% performance but be better than the other person who could stand in?

In a similar vein, injury research has noted that performance-focused priorities impact injury prevention strategies, with the culture of elite sport to 'push one's body' overriding athlete health protection (Bolling et al., 2020). As further highlighted, coaches' views of illness severity may undermine athlete health protection and should be managed with caution to protect athletes from continuing to train and play at the expense of their health. The experiences of ASP and players illustrate that illness was not a concern and illness prevention was not a priority prior to the COVID-19 pandemic. Such accounts may serve to explain the lack of awareness of illness prevention guideline and uptake. However, players' personal experiences of illness painted a different picture, as theme two illustrates.

It's not an issue, until you get ill... then your behaviour might change

Experience of illness, both first-hand by players and second-hand through ASP supporting players with illness, shaped participants' thoughts, feelings, and behaviours towards illness events. Underpinning the meaning of this theme was the notion that you 'don't care about illness until you or someone you

know experiences it'. For example, Caleb (academy strength and conditioning coach) shared: *'until someone gets ill, no one cares about it'*, Chloe, (international rugby player) reinforced this view when she said that: *'no one wants to be injured, but no one ever really thinks oh I don't wanna [sic] be ill until you are ill... and then you get ill and it's like uh, now we sort it.'*

Experiencing an illness episode changed players' and ASP's behaviours and their priority of illness, acting as an enabler, as evidenced through the personal accounts of some of the participants. For example, Chloe, international rugby player, shared:

...the second you're ill...it stops a lot of things you know you're all of a sudden fatigued, or if you've got a cold the inability to breath while you're training ... in the past it [illness] didn't sit as high [priority] but I think as I got older it started to, I think after glandular fever it sat a lot higher for me...because I've seen the effects of literally how it... can really damage, like it can... prevent your inability [sic] to breath, it can really fatigue you, so that changes everything, that changes your decision making...your fitness levels...and even your mood...

Further illustrating this enabler, international rugby player, Shannon, highlighted the behaviour changes she made to manage and prevent illness after experiencing multiple illness episodes:

I used to probably get 6 or 7 colds each year... I believed [it was] down to ... not getting enough sleep, which always led to me getting run down and getting a cold ... so my mum encouraged me to actually write down ... any time that I did ever get a cold or an illness ... [I] realised that my sleep was that limiting factor for me ... from that point in time as an athlete ... I very much have put quite a big ... emphasis on my sleep, and ... trying to improve my sleep ... I've probably in the last 2 and a half years only had one or two colds...

It is known within the literature that personal experiences of ill-health can influence an individual's risk perception (i.e., their belief about potential harm) (Brewer et al., 2007). In a similar vein, recent calls to action have been made emphasising the need to use previous injury experience as a learning opportunity to facilitate athlete and ASP engagement in injury risk reduction practices (Edouard et al., 2022). Furthermore, research exploring responses to sport injuries identified a 'lessons learned' theme, with recently injured athletes adapting their behaviours to reduce their risk of re-injury upon return-to-play (Clement et al., 2015). Although it may appear contradictory, that for adoption of guidelines to

take place players and ASP must first experience illness, reflective practice has been deemed an important strategy for sport-injury related growth (Wadey et al., 2019), and the same could also be said for illness. However, despite exposure to illness sparking change in perception and behaviours, the dynamic nature of human behaviour was evidenced, with some ‘slipping back into old habits’ as noted by Tanya, academy sport scientist:

If a few players got sick, like ill, and couldn't come to training or couldn't play, I think that is then when coaches and other staff would be like “okay yeah we need to ...sort out something to help prevent this” but then again I think if it then didn't happen again, people forget about it

Drawing upon the reflective motivation context of the COM-B and TDF (Cane et al., 2012; Michie et al., 2011), these findings highlight the importance of players and ASP being aware about the consequences of illness and using this knowledge to guide their behaviours. Using education as an intervention, the consequences of illness could be distributed through infographics, presentations and real-life experiences of those who have previously experienced illness. By using a credible source, such as a player who has experienced illness, information about the health consequences of illness and impact of non-adherence to guidelines could persuade the rugby community to engage in illness prevention behaviours. Further theory-driven practical applications are highlighted in supplementary material 2. Experience of illness was generally perceived as an enabler to the uptake of illness prevention guidelines, prompting those who experience illness first or second-hand into adopting new behaviours, usually due to the consequences they have experienced or observed. Later themes revisit this notion, addressing the impact of COVID-19 on perceptions and behaviour change. Taking together the data and quotes presented, the impact of experiencing an illness is highlighted. Similarly, the subsequent theme identifies the influence of ‘rugby’s meaning’ to participants, and the impact of this on the barriers and enablers to uptake of illness prevention guidelines.

The rugby identity: a powerful force

Within this theme, players expressed a sense of identity as a rugby player and the importance of rugby within players’ lives, influencing their views towards illness prevention. Athlete support personnel also shared their observations of players and the impact of illness causing isolation and negatively affecting

mental wellbeing. Harry, an academy rugby player, expressed his beliefs about the consequences of illness for development and performance in rugby:

Being a rugby player and stuff like getting ill, say if you're ill you can't go to training and then it's sort of gonna affect your like performance and like development and stuff like that so. Probably like talking about it now ... like sort of makes you realise that if you are ill, and you're missing training and stuff like that, then it could be, could like affect you...

Robert (academy rugby player) echoed this when he said: '*...especially since I left school...rugby's got more important and it just sort of makes you realise how much you need to look after yourself so that you can still do those things [e.g., play rugby]...*'. In addition to protecting their ability to develop and perform as a rugby player (by avoiding time off due to illness), players were still conscious of their role in the rugby environment to limit illness spread across their team. Harry demonstrated feelings of responsibility when he said that: '*If I feel ill and I am ill, I'd be passing it to my teammates and if it goes round like all the players and staff or whatever, it can affect not only myself but like all the other people like even [the] first team*'. The feelings of personal responsibility to mitigate illness spreading within the rugby environment demonstrates the socialisation processes that are inherent in team sports and the identities and responsibilities that form as a rugby player, as well as a team-mate. Shannon, an international rugby player, sums this idea up when she says that: '*if you're not 100% percent and you're [not] giving everything you can do ... as a player and as a teammate, have you let other people down by not taking care of yourself and not doing everything you need to, to keep yourself healthy?*'

Aligning with the motivational context of the COM-B and TDF (Cane et al., 2012; Michie et al., 2011), socialisation and social/professional identity, in this regard the 'giving everything' and 'letting other people down', strike an emotive chord displaying what rugby means to this player and the intertwining of identity and behaviours. The personal responsibility, to give everything to rugby, revisiting the 'bodies placed on the line' concept, emphasises the strong importance of rugby for players and how this can greatly impact their perceptions of illness and their behaviours. Furthermore, there was agreement among ASP that players' exposure to illness resulted in feelings of low mental wellbeing and negative

stigma, potentially driven by isolation from training. Mason (academy strength and conditioning coach) acknowledges that ‘...*especially if somebody’s really eager and really hunger [sic] and they’re missing training...because of illness then it’s potentially gonna take a toll on them mentally*’. Similarly, Michael, an international academy sport scientist, expanded upon the effect of illness on players, and the impact of having to ‘sit on the side-lines’ when he notes that: ‘*from a psychological perspective...like players they just- they want to play and so ... if they’re injured or if they’re ill, they can’t play, they’ve gotta [sic] sit on the side-lines and watch- that’s...mentally very tough for them...*’. Corroborating previous injury literature, rugby players suffering from injury were impacted by psychological challenges, such as frustration and stress (Murphy & Sheehan, 2021). Ensuring players are well supported psychologically during periods of illness is essential to limiting psychological load and feelings of exclusion. Rugby can form a strong identity amongst the players and ASP and the commitment generated shapes playing, training and social behaviours. This passion for playing, training, and protecting the training environment is driven by the notion that ‘rugby means everything’ but this drive and passion also results in a catch-22; wanting to protect, but also wanting to play. The participants’ passion and commitment for the sport was deemed a barrier to the uptake of illness prevention guidelines, with players and coaches sharing their experiences of continuing to train through illness, despite international guidelines recommending otherwise. For example, Hannah shared a poignant account of her commitment to training, and wanting to play at all costs, regardless of illness:

I do actually remember both me and my housemate had it at the same time...and we both got really ill, and I remember we were like crawling around on game day trying to convince ourselves we could still [play] but there was just no way... that probably gives you an insight into how desperate I am to always train and play but...that was probably the one time I missed a game for an illness.

With the entrenched cultural norms to ‘eat, sleep and breathe sport’ deemed as success markers for progression in the elite sport (Mitchell et al., 2014), athletes commonly take on a ‘win / play at all costs’ approach. The current findings underscores earlier assertions that athletes display a willingness to compete ill, irrespective of pain or consequences (Mayer et al., 2018), with participants voicing their determination to ‘fight tooth and nail’ to take part despite ill-health. Furthermore, athletes’ strong

identification with sport may push them to train excessively and jeopardise their health (Brewer et al., 1993; Gustafsson et al., 2007; Sparkes, 1998). Woven into the very fabric of players, missing training and competition may be seen as much a loss of development, as a loss of identity, and further reinforces the focus on performance over health raised in previous themes. This determination to train through illness was recognised as also being driven by the coaches. Chloe, an international rugby player, recounted her experience of coach pressure to train through illness: '*we had a coach who was like if you're not dying, you're playing*'. Reuben, academy strength and conditioning coach, further illustrates coaches' pivotal role in setting the cultural norms for illness prevention:

There's often a kind of tough it out mentality from...coaches from what I've perceived so if you've got a cold, just get on with it...or at least if they are one of our expected higher prospect players there's potentially more pressure to make sure that they stay in and train even if they are ill regardless of the fact ... they probably would've spread the cough-cold or whatever...across the squad where as they probably shouldn't have been training

Katie, international physiotherapist further reinforces the role of the coach and the potential conflict that can ensue:

I think ... a lot of it comes down ... to the coaches beliefs ... so the coach might really understand why you take it so seriously but then sometimes they might just you know take the mickey a little bit and just be like "well I don't really- you know, my experience of that has been different" so I think ... they just kind of, you know [might] be like oh you know just tough it up and get on with it

Previous studies identified that athletes deemed 'coaches orders' to withdraw from competition as a stronger reason to do so than that of 'doctors orders', and even less so when requested to do so by a physiotherapist (Mayer et al., 2018; Mayer & Thiel, 2016). It could be theorised that pleasing coaches and following orders may affirm players' rugby identity and elicit feelings of social acceptance, demonstrating to their coaches their willingness to 'do whatever it takes', as well as reinforcing to themselves that 'this is what it takes'. Notably, these findings shed light on the social pressure that coaches impose upon players and ASP for athletes to continue to train through illness, and further

reinforce earlier notions of the strong focus on performance over health in rugby contexts, and again underscores the need for shared responsibility for illness prevention.

COVID-19: a pivotal point in illness prevention and protective behaviours

Sparkling change in behaviour, influencing training and competition environments, and driving implementation of illness prevention strategies, COVID-19 was a prominent enabler. Participants regularly reflected upon historical behaviours, highlighting the differences in practice and perception of illness in rugby environments since the pandemic began. Mason (academy strength and conditioning coach) notes: *‘I guess now post-COVID we’re like more aware of personal protective equipment and just like regular hygiene so...washing our hands frequently so I think we may have taken that for granted’*. Similarly, increased awareness on illness due to COVID may have initiated enhanced fixation on hygiene and cleanliness, as Chloe (international rugby player) shared:

I’m obviously a lot more on it with ... hand sanitizer and there’s times where you’re washing your hands more...you know if you go to the bathroom you just wash your hands, but now it’s more like one, two, like proper counting, properly giving it a scrub

The introduction of new practices within rugby environments was frequently raised, further reinforcing the pivotal role COVID-19 has played in promoting illness prevention strategy implementation. Shannon (international rugby player) shared that: *‘post-pandemic...the environment is definitely helpful and supportive in terms of having hand gels everywhere and all the posters everywhere to encourage people to be washing their hands, wearing masks...keeping ... a distance, in that way [it] is definitely helpful’*.

These aspects of behaviour change raised in the previous quote signal the impact of behaviour change strategies and techniques, such as the environmental influence, and the use of prompts and triggers. Within public health settings behaviour change theory has been applied to COVID-19 guideline implementation (Michie & West, 2020), as well as in rugby contexts, through adapting ‘post-match handshake’ behaviours to reduce the transmission of COVID-19 (McKenna et al., 2020). In the current study, participants raised that preventative strategies had been brought into place in rugby settings, although these were introduced as ‘rules and requirements’ instead of through self-driven behaviour

change. Players also reflected upon new practices and that continuation of these may mitigate risk, as Claude (academy rugby player) described:

You know with what's going on in the world [COVID], [the club] started to bring more stuff in like cleaning down gym equipment and stuff...and I don't think that'd be, so bad to kind of continue, I think cos obviously [there's] quite a few people using it [gym facilities], I think although it might not be that high of a risk, it's a risk that quite easily reduced just by like doing something as simple as cleaning down equipment...

Similarly, Hannah reinforces this view when she says: *'I hope, you know, some of the behaviours that have come in this year will be continued because I think from like a player availability ... point of view, it's been way better'*. Literature reviewing risk factors of COVID transmission in sport also noted the applicability of risk mitigation strategy use beyond the COVID-19 pandemic to reduce general illness transmission among athletes (Jones, Phillips, Valeriani, et al., 2021). Athlete support personnel also recognised the change in behaviour that COVID-19 has brought to the rugby environment. For example, recognition of undesirable behaviours regularly elicited in rugby have been brought to the forefront since COVID-19, as Katie (international physiotherapist) shared:

Not sharing drinking bottles I think is a massive one...we've had to like label each drinking bottle and make sure that they don't ... share ...drinks cos that was another thing before COVID like everyone used to just use a water bottle ... when they brought them on during the breaks in the game and as a physio ... they just used to make you ... recoil in horror [at] the thought of them doing that.

Hannah (international rugby player) commented on the ease of these prevention behaviours and the influence COVID-19 has had on our perceptions of these, when she said that *'probably what we've shown through these times [COVID] is that...we can make changes which put us at less risk of getting ill'*. As illustrated by participants, COVID-19 has resulted in movement towards increased focus on illness in rugby. Despite its damaging impact on the lives of many, COVID-19 may have benefitted rugby environments through increasing awareness and implementation of illness prevention strategies. These environments, however, must be capable of sustaining implementation of these guidelines. Indeed, the risk of 'slipping back into old habits' after COVID-19 was raised by Mark, first team sport

scientist when he acknowledged that *‘it could happen that you know coronavirus disappears and everybody goes back to the same habits that they once had because its path of least resistance, “Am I really bothered about cleaning my hands because there’s no implication of it, right now if coronavirus wasn’t here”?’* Regression and deterioration of compliance to prevention guidelines was also noted in the general public over the initial lockdown period (Wright & Fancourt, 2021). Adoption of illness prevention behaviours may therefore be time-limited and pandemic-driven due to COVID-19, thus warranting further implementation of illness prevention strategies to maintain guideline adherence. The final theme of this study examines the rugby environment and the practicality of meeting illness prevention guidelines.

The rugby environment: ill-equipped for illness prevention

Within this final theme participants shared a common view of the rugby environment being under resourced and ill-prepared for illness prevention. Athlete support personnel and players shared their reflections on the practicality of the guidelines teamed with the inherent physical nature of the sport, as Chris (sport psychologist) outlines: *‘rugby as a sport...has lots of close proximity and something like that then becomes really, I know it’s not dangerous as in to peoples’ health, but it becomes really dangerous because then it [illness] just spreads so easily’*. Will (academy rugby player) echoed this when he said:

You didn’t feel the need to...cos you were in such close contact with everyone...and like if we were wrestling you’d be practically hugging for 5 mins or whatever you didn’t really feel the need to do, you know, wash your hands, [or] wash the bar[bell] after someone else had grabbed it

Upon reading the guideline document, participants acknowledged the impracticality of some guidelines due to the rugby environment, as Michael (international sport scientist) outlined:

...like if you’re on a pitch and you sneeze, there’s no sink, next to you, so what do you do? You wipe your hand on your shorts and you keep playing. And like you’re not gonna run to the side-line to get... sanitary gel or something... so I guess while you’re playing...or while you’re training, some of these things aren’t possible

With limited knowledge of the IOC guidelines a feature across participants, ASP were in agreement that little to no education had been provided to themselves or players on illness prevention, as summarised by Tanya, academy sport scientist:

I think it like gets discussed within things like so for example, [the] physio did a talk on just general kind of what to do if you're ill, but ... there's no kind of...education or workshop on how to help reduce risk and spread

This was echoed by Kerry, international coach, and ex-player, highlighting coaches as key stakeholders in education provision:

[Players] need educating as much as the coaches... for me to buy in as head coach and for it to take a bit more extra time maybe on a training morning, I need to know the why, so that I can be confident in saying it to the teams and that's not like from a female or male point of view that's a head coaching point of view that you've kind of gotta [sic] be able to say, yes it adds value to our programme or no it doesn't...

For individuals' to change their behaviour they require the motivation, capability and the opportunity and to do so (Michie et al., 2011). In the present study, a recurrent barrier to the uptake of guidelines was the rugby environment, relating to all three aspects of the COM-B (Michie et al., 2011) and a variety of domains from the TDF (Cane et al., 2012). A lack of education and knowledge for participants limited their psychological capability to uptake guidelines. Similar experiences have been expressed in injury research, with Bonell Monsonís et al. (2021) identifying the need for better awareness and education of injury prevention at earlier career stages. This issue does not solely lie with athletes, and illness prevention should be targeted at all stakeholders of sporting contexts, as echoed by Bonell Monsonís et al. (2021) on injury. Greater intervention to educate ASP and players on the illness prevention guidelines, not solely from just a COVID-19 standpoint, may be essential for uptake and longevity of guideline adherence.

Many players of the participant group identified managing a dual career as a barrier to the uptake of illness prevention guidelines. Being a semi-professional athlete, whilst also maintaining a daytime job

or educational commitments forces players to juggle their wellbeing, and make prioritisation decisions when demands clash as Hannah, international rugby player outlines:

...there's one element here [in the illness prevention guidelines] around recovery...and making sure that there's like optimal recovery strategies and time and sleep, I mean many a time I've finished a game, one- late evening and I'm in work the next day, so that recovery becomes very low on the priority list because, do you know, I've a full-time job outside [of] that...

Dual career players require support to manage their external commitments to allow them to flourish within their sporting careers. Previous literature has identified that managing a dual career increases likelihood of mental fatigue in elite sport (Russell et al., 2019), potentially putting players' at greater risk of illness, due to identified links with illness and disturbed balance between psychological stress and recovery (Foster, 1998; Main et al., 2010; Putlur et al., 2004). Additionally, greater resource is required for players, specifically women's and academy teams, to provide them with the full range of support staff and resources. Here Shannon, international rugby player, shared her experiences of the women's game:

I think all the foundations are there... however the women's side is a lot less funded than the men's side so again if we think about those experts in the field that could advise and support ... and [be] encouraging some of these practices I don't think we have access to those- that full spectrum. We also don't get food whereas the lads do get food...and all of those other elements

Across both the men's and women's game ASP highlighted their struggle to manage and support all guideline implementation, as Katie, international physiotherapist shared: '*especially with a part time role I think...I've got to recognise that I can't do everything*'.

The lack of time for ASP to implement strategies combined with the wealth of recommendations, was commonly raised as a barrier, as Chris, sport psychologist indicates in the following extract:

there's 5 pages of recommendations like...who's gonna implement them, how are they gonna be implemented and if these become too onerous to be implemented then they'll inherently...be dropped because people are busy enough already...

Akin to the findings of the current study, a 'stretched service' was identified as a barrier to athlete's nutritional adherence in recent research utilising the COM-B model in elite sporting contexts (Bentley

et al., 2019). A lack of staff time and limited resource was raised in the current study as a potential barrier to uptake. Similarly, research exploring elite sport science and management staff stressors identified ‘too much work’ as themes of stressors (Arnold et al., 2019). Therefore, greater support is required for ASP to implement prevention strategies whilst also completing day-to-day tasks. Overall, players and ASP accounts of the rugby environment suggest that in its current format, the context is poorly equipped to manage and support the prevention of illness. More specifically, women’s and academy teams require greater support such as, increased staff resource and greater funding for a full spectrum of athlete provisions. Without appropriate support, these players struggle to meet and implement prevention guidelines, further widening the gap and inequality in player support provision. Furthermore the impracticality of guidelines for use in rugby requires assessment to promote effective implementation.

Limitations

This study was purposefully aimed at rugby players and ASP working within rugby. With the majority of participants playing or working within the UK and with limited male participants from those working or playing in rugby union, the identified views may not represent all those working within rugby. Additionally, although participants were asked to solely focus on their experiences in rugby, we cannot exclude the possibility that they may have drawn upon other illness episodes in their accounts. Furthermore, illness was not explicitly defined as per the IOC recommendations (Bahr et al., 2020). During interview questioning participants were referenced to “coughs and colds, vomiting and diarrhoea and skin problems” as examples, therefore discussions surrounding other illnesses classified under the IOC definition (e.g. mental or social wellbeing) may not have been touched upon, and further research is required using a broader definition of illness.

Conclusion

This was the first known study to conduct an in-depth analysis of the barriers and enablers to the uptake of illness prevention guidelines in rugby. This study sought to address a notable gap in the literature, namely, players and ASP’s experiences and perceptions of illness and illness prevention. The findings

illuminate that illness is of little concern in rugby and illness prevention is low priority, with knowledge and application of illness prevention guidelines limited across all participants and settings. A range of factors, including individual, social, and environmental influenced participants' adoption or non-adoption of guidelines, namely their strong affinity with their rugby identity, under-resourced rugby environments, the COVID-19 pandemic and experiencing illness first-hand. The findings point towards an array of barriers and enablers to guideline uptake, which offers an important contribution to knowledge in improving illness guideline adoption in rugby settings. Collectively, our findings offer new insight into illness prevention, moving away from prevailing aetiology and epidemiology research, and instead voicing athlete experiences and perceptions to development and shape more effective athlete health protection strategies (Bekker et al., 2020).

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CRedit authorship contribution statement

LC: Conceptualization, Methodology, Investigation, Formal analysis, Writing - original draft, Writing - review & editing. **BJ:** Conceptualization, Supervision, Writing - review & editing. **SB:** Conceptualization, Methodology, Formal analysis, Supervision, Writing - review & editing.

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Declaration of Competing Interest

None

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Figure Titles

Figure 1 The COM-B system – a framework for understanding behaviour (Michie et al., 2011)

Figure 2 Thematic map of 5 key themes and sub-themes linked to COM-B components

Supplementary Material

Supplementary Material 1 – Pseudonyms and Participant Information

Supplementary Material 2 - Practical recommendations mapped to COM-B, TDF domains and BCW intervention functions and policy categories