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# 'Body on the line': experiences of tackle injury in women's rugby union – a grounded theory study

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## ABSTRACT

**Objectives** Tackle-related injuries account for up to 67% of all match injuries in women's rugby union. The perspective of women players on tackle injury can help key stakeholders understand psychosocial determinants of tackle injury risk and prevention. We aimed to capture psychosocial processes that explain tackle injury experiences and behaviours in women's rugby union.

**Methods** We conducted a qualitative study using a grounded theory approach. Adult women players, with at least 1-year senior level experience, were recruited from Europe, South Africa and Canada between December 2021 and March 2022. Data were collected through semistructured interviews and analysed in line with grounded theory coding procedures.

**Results** Twenty-one players, aged 20–48 years with a mean 10.6 years of rugby playing experience, participated. In our analysis, we identified three categories central to participants' experiences of tackle injury: (1) embodied understandings of tackle injury, (2) gender and tackle injury risk and (3) influences on tackle injury behaviours. Participants reported a sense of fear in their experience of tackling but felt that tackle injuries were an inevitable part of the game. Tackle injury was described based on performance limitations. Tackle injury risks and behaviours were influenced by gendered factors perpetuated by relations, practices and structures within the playing context of women's rugby union.

**Conclusion** Women's tackle injury experiences were intertwined with the day-to-day realities of marginalisation and under preparedness. Grounded in the voices of women, we have provided recommendations for key stakeholders to support tackle injury prevention in women's rugby.

## WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Tackle injuries pose a considerable burden to training and competition in women's rugby union.
- ⇒ There is a lack of evidence on tackle injury experience and prevention in women's rugby union.

## WHAT THIS STUDY ADDS

- ⇒ Women's experiences of tackle injury are shaped by social and cultural values in rugby that normalise injury and encourage 'putting your body on the line' to gain respect in a sport that does not necessarily account for women's own preferences for play.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ Clinicians, coaches and sport organisations can advance tackle injury prevention strategies in women's rugby union through an understanding of the perspectives and playing contexts of women players, and of the social and cultural barriers that exist for women players in their sport. Future research and policy should be conducted in consultation with key stakeholders to inform contextually relevant evidence-based injury prevention in women's rugby union.
- ⇒ Tackle injury prevention should prioritise multilevel engagement to create safer, inclusive and equitable playing environments for women rugby players.

## INTRODUCTION

Participation, opportunities and pathways have grown exponentially in women's rugby, with 2.7 million registered players in 2018.<sup>1</sup> The tackle is the most common in-play contact event in women's rugby<sup>2</sup> and accounts for up to 67% of all match injuries.<sup>3</sup> Injury frequency risks long-lasting impact, hence mitigating tackle injury is a high-priority research area for the sport's governing body, World Rugby.

Tackle injuries are multifactorial<sup>4</sup> and despite prevention programmes (eg, RugbySmart)<sup>5</sup> and tackle law changes, they remain the leading cause of injury in rugby union.<sup>6</sup> Existing tackle injury mitigation efforts have been informed by research and frameworks derived from men's rugby.<sup>4–6</sup> Given the extent of tackle-related injury problems in rugby<sup>6</sup> and the fact that women remain under-represented in rugby research,<sup>4</sup> understanding the experiences of women rugby players in relation to

injury broadens the tackle injury prevention debate and helps ensure that tackle safety strategies are relevant and representative of the playing population. Finch<sup>7</sup> proposed the Translating Research into Injury Prevention Practice, which stresses the importance of understanding the implementation context in relation to sustainable sports injury prevention.<sup>8</sup> Understanding stakeholder attitudes and behaviours regarding injury risk and prevention are critical, as they influence players' adoption of prevention strategies.<sup>8</sup> The socio-ecological model (S-EM) is widely used for understanding these influences on human behaviour.<sup>9–10</sup> For instance, qualitative studies reveal cultures that shape concussion injury risk perceptions in rugby<sup>11–12</sup> and similarities between men and women in their adherence to the 'sport ethic'.<sup>13</sup> However, the contexts in which men and women play, do differ in terms of training age, performance pathways and gendered training environments.<sup>14–15</sup>



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Understanding athletes' injury experiences and behaviours is necessary to bridge the gap between tackle injury prevention and its implementation<sup>16</sup>—in this case, in women's rugby. The aim of this study was to capture key psychosocial processes that explain tackle injury experiences and behaviours in women's rugby union, from women rugby union players.

## METHODS

### Study design

We conducted a qualitative study using a grounded theory (GT) approach to generate concepts and categories from our data.<sup>17</sup> Broadly, GT is set of techniques and procedures to build concepts, and in many cases theory, from qualitative data.<sup>18 19</sup> GT is concerned with psychosocial processes of behaviour and how and why people behave in different contexts. We sought to identify psychosocial processes that explain tackle injury experiences and behaviours in women's rugby union. In this study, a constructivist GT approach<sup>17</sup> was taken. A key premise of constructivist GT is that the researcher is fully implicated in the construction of the data. The study is reported according to the Consolidated Criteria for Reporting Qualitative Research guidelines<sup>20</sup> (online supplementary tablet 1).

### Equity, diversity and inclusion statement

The author group come from different professional backgrounds: a current elite rugby player and practising sports medicine clinician (KD); health sciences academic and practising sports medicine clinician (FW) and health sciences academic with expertise in qualitative design (GF). KD has experience of being injured in the tackle and of tackling where other players have been injured. This positioned us to decipher and understand the contexts in which women players operate. The study population included senior women rugby players of a spectrum of ages, and playing experiences; however, despite efforts to recruit from Global South settings, we acknowledge that this cohort may underrepresent individuals from these communities. We will discuss the influence of gender on our findings in the discussion.

### Patient and public involvement

A player stakeholder reviewed both the study proposal and study findings for relevance and has advised on the dissemination of the findings. The stakeholder is from an Indigenous community

in the southern hemisphere, started playing rugby in adulthood and has played rugby at an international level.

### Sampling and recruitment

Between December 2021 and March 2022, 21 participants were recruited through rugby social media networks. Participants were eligible for inclusion if they were: >18 years old; playing senior women's rugby union; playing senior rugby for at least 1 year; and able to converse in English. Initial sampling was convenient by participant self-selection (n=8). During convenient sampling, we reviewed the composition of our sample so that in further sampling, we could balance the representation of athletes from diverse geographies and playing backgrounds. Hence, purposive sampling was used to recruit athletes (n=2) from Global South settings to increase diversity and inclusiveness in the sample. Sampling proceeded from purposive to theoretical sampling (n=5) based on emergent findings in the data.<sup>19</sup> After interviewing 21 participants, key concepts which emerged in the data were fully dimensionalised for their properties and characteristics.<sup>17</sup>

### Participants

The experiences of 21 women rugby players from Europe (n=16), South Africa (n=2) and Canada (n=3) (table 1) are presented. Playing experience varied from club to international level with a mean of 10.6 years of experience. Age ranged between 20 and 48 years. Players from diverse playing backgrounds and sporting systems are represented. Participants' introduction to rugby varied, but the majority of players (n=16) commenced playing rugby in adulthood.

### Data collection

Prior to participation, participants provided written informed consent and completed a brief demographic questionnaire which included participants' age, playing position, the highest level of competition achieved and years playing rugby (online supplementary table 2).

Once eligibility was confirmed, participants engaged in a semistructured interview on the video conferencing platform Zoom.<sup>21</sup> Both KD and FW conducted the interviews. Interviews lasted between 35 and 67 minutes and none of the participants had a prior relationship with the interviewers. The interview guide was informed by the findings of a recently published scoping review on the physical and technical demands in female field collision sports<sup>2</sup> (box 1). The health-belief model<sup>22</sup> was

**Table 1** Participant and site characteristics

Participant characteristics	Ireland	England	Canada	South Africa	Scotland
Participants	11	4	3	2	1
Participants age range	20s–30s	20s–40s	20s–30s	20s	30s
Playing experience (mean years)	1–19 (10)	7–20 (12)	8–16 (12)	2–10 (6)	11
Competition level	Club first and third division, Provincial, International	Club first and third division, Provincial, International	College first division	International	International
Playing position	6 backs, 5 forwards	2 backs, 2 forwards	1 back, 2 forwards	1 back, 1 forward	1 forward
Country characteristics					
HDI, 2019 (world ranking)	0.955 (2)	0.932 (13)	0.929 (16)	0.709 (114)	0.932 (13)
World ranking	9th	1st	4th	13th	11th
First year participating in Women's Rugby World Cup	1994	1991	1991	2006	1994
First year of professionalism	2022	2019	–	–	2022
Note: first women's rugby world cup took place in 1991. HDI, Human Development Index.					

## Box 1 Interview questions

1. Tell me about your playing career to date? (probing: journey into rugby, enjoyable aspects of rugby)
2. In your own experience, how is women's rugby perceived? (probing: home environment, media coverage, coaches, club members)
3. Tell me about the barriers you've experienced to playing women's rugby? (probing: individual, interpersonal, club and institutional environment/resources, society)
4. What comes to mind when you think about tackling in women's rugby? (probing: cognitions, emotions)
5. Tell me about how you learned to tackle? (probing: tackle coaching experiences, learning environments)
6. How confident are you in your tackling ability? (probing: understanding, preparedness, self-efficacy)
7. Tell me about your experience of tackle injuries in women's rugby? (probing: tackle injury beliefs, perceived susceptibility, severity, behaviours, risk perceptions, barriers and facilitators to injury mitigation)
8. After reflecting on your experiences, is there something else you would like to add?

also used to support the development of the interview guide and two pilot interviews were conducted to explore the suitability of questions. The interview guide was revised by all authors to ensure focus on the topic and to allow for flexibility in the interview for further interrogation of key concepts.<sup>23</sup>

Interviews were audiorecorded and transcribed verbatim. Field notes were made during and following each interview by the interviewers. After each interview, the interviewers wrote a case-based memo reflecting the interview. Interviews were member-checked by participants whereby each participant reviewed their transcribed interview. Minor adjustments were made to the wording where necessary. KD then reread all transcripts and memos to fully familiarise themselves with the data.

### Data analysis

We collected and analysed data in tandem and emerging findings guided sampling and questions. While the above interview guide was generally followed, the interviews also allowed for prompting and probing of participants in the direction of the emergent concepts, in line with theoretical sampling.<sup>23</sup> For example, when data were indicating the influence of gender, the probing questions in box 1 were asked in a way to further interrogate the influence of gender.

KD was guided in the analysis by both FW and GF, the latter is skilled in GT analysis. KD analysed the data using initial, focused and theoretical coding. NVivo V.1.6<sup>24</sup> was used to code data and to demonstrate how codes formed concepts and categories. Data were analysed using the constant comparison method. First, in initial coding, data were broken down into discrete units of meaning ('codes'). Comparing data with data aggregated these codes to build concepts and categories (larger concepts). During focused coding, key concepts and categories were interrogated further for variation (difference) and meaning. As sampling proceeded from the convenience and purposive to theoretically based on emergent findings, we found that participants' experiences of tackle injury were underpinned in many incidents, by gender.<sup>25</sup> From this insight, we went on to recruit more diverse participants who were in a position to give us a comprehensive understanding of the processes behind categories (eg, players

who were able to account for experiences that they felt were rooted in gender). During the final stage of analysis (ie, theoretical coding), relationships between key categories were then fully examined to identify key context-related psychosocial processes explaining the experience of tackle injury for participants.

The case-based memos, combined with summary tables, conceptual diagrams and more conceptually oriented memos formulated by KD, were used at each stage of analysis. Memos functioned as an audit trail for how key concepts emerged in the data. Regular team meetings between the researchers allowed for collective examination of our assumptions about the data and about our analysis of the data. Once categories and concepts were finalised, each category was mapped to the S-EM. Peer debriefing with other stakeholders working with rugby players was used to consider biases and assumptions made by the authors. Peer debriefing was conducted during the latter stages of data collection and analysis and on completion of data collection and analysis. Peer debriefing helped further contextualise the data to the playing environment of participants.

### Findings

Through the analytical processes of abduction<sup>17</sup> in which the researchers made inferences between the data, we identified the various experiences of tackle injury expressed by the participants in the following categories: (1) embodied understandings of tackle injury; (2) gender and tackle injury risk and (3) influences on tackle injury behaviours. Figure 1 illustrates the categories and the concepts which comprise them. Figure 1 also outlines the relationships between the categories and concepts. The core category 'body on the line' incorporates all other categories and explains the overall experience and behaviour among participants in relation to tackle injury. Tackle injury was underpinned by specific embodied understandings of tackle injury grounded in gender-related experiences of play, experiences which were shaped by both personal and broader subcultural and societal influences. Categories and supportive quotes for different levels of the S-EM are provided in online supplementary tables 3–5.

### 'Knocks and bumps': embodied understandings of tackle injury

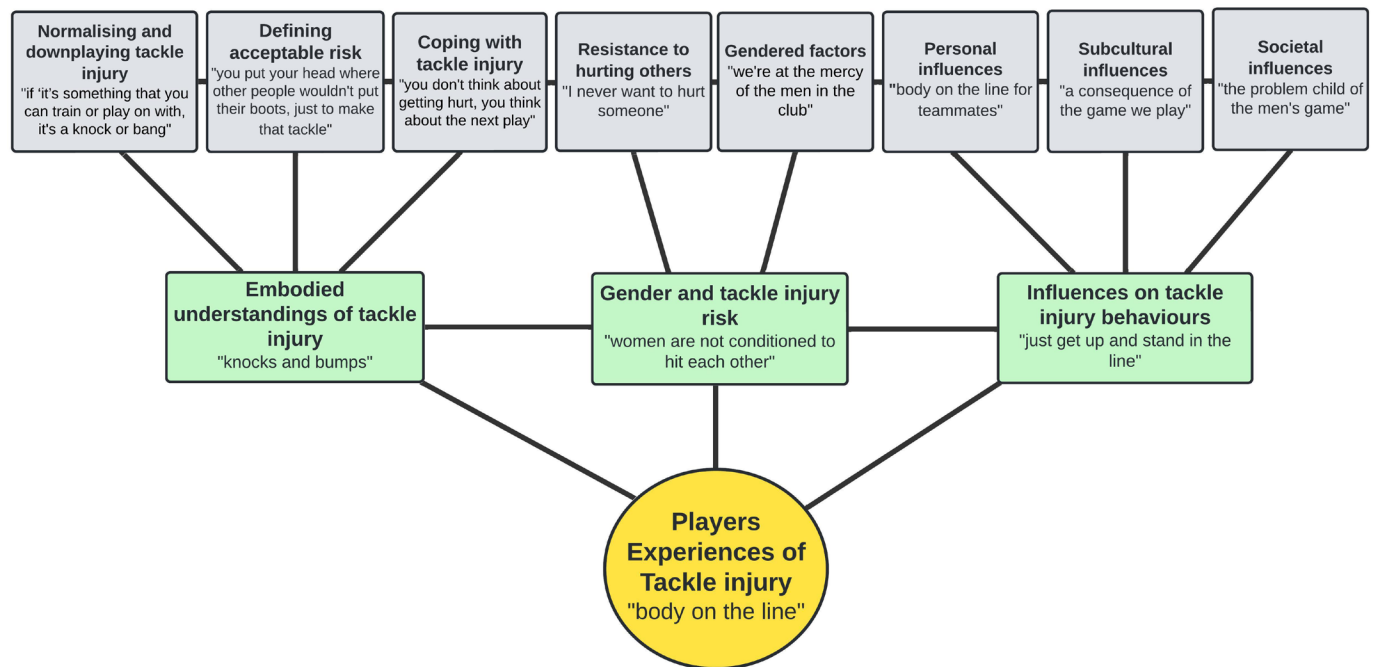
Participants' bodily experiences of playing rugby and approaching the tackle were rooted in how they perceived themselves in the environment in which they played. Participants had all suffered various degrees of pain and injury from tackling. Normalising and downplaying tackle injury, defining acceptable risk and coping with injury were primary dimensions common to all participants' embodied understanding of tackle injury.

### Normalising and downplaying tackle injury

Injuries were viewed as 'inevitable' (P13) and 'part and parcel' (P15) of players' engagement in rugby, and in 'an environment that normalises it' (P18). Participants agreed that it was unreasonable to expect not to play with pain and injury due to 'the physicality and brutality of the sport.' (P2):

You have to be either brave or stupid, don't you?...I think if you weren't brave you wouldn't play it...I don't think anybody's 100% fit if they play rugby. (P15)

Participants described a culture of hardiness in which players demand everybody around them to be 'brave' (P20) and 'put your body on the line' (P2). One player described how interactions with teammates shaped her understanding of tackle injury:



**Figure 1** Explanation of the experiences of tackle injury in women's rugby union.

I broke my finger in the warm-up before an international game and one of the girls turned and said to me that 'it's just a mindset', and it was. You just play the game, strap it up, get a load of pain killers into you and just play the game. (P5)

Non-medical descriptive language (eg, 'knocks and bumps') (P1) was used by participants to recall tackle injuries. An injury was commonly defined by participants as something that 'keeps you out for a game or training' (P2) whereas if 'it's something that you can train or play on with, it's a knock or bang' (P2). Players experienced countless injuries during their careers that were severe, but which they labelled as 'nothing major' (P1). Participants described themselves as 'lucky' (P3) not to have sustained more injuries.

#### Defining acceptable risk

Participants did not view pain as a serious impediment to playing, with many continuing to play with an implicit trust in their bodies. They judged their ability to continue to play on the metric of being able or not to 'be a body in the line' (P6), and they were intentionally dismissive of injury by using casual language to rationalise it:

I played a match on Saturday, and it [wrist] was a wee bit niggly... it was fractured...It happened at some stage during the match, but I played with it so it wasn't too bad. (P10)

Owing to the latest media attention on brain health and rugby, there was an understanding that there was a point of diminishing returns where continuing to take such physical risks became harmful to their long-term health:

That's the only thing I am most scared about, I would really think about my career if I got any more concussions, and I think that's the only thing that would make me stop. (P5)

#### Tackle injury behaviours

Participants used strategies to manage and hide the effects of tackle injuries and continue to play in such situations for fear of missing subsequent games:

I would absolutely just push through [a concussion] or if...my head was really pounding I'd probably take some time off and say "oh I rolled my ankle". I would probably have tried to avoid admitting that I hit my head until maybe something happened or my head hurts so much it was like "Oh, this is serious." (P11)

Despite tackle coaching, a common issue was that under match conditions, players tended to revert to 'whatever it takes to get her down' because 'it's not our first instinct to have a proper tackle technique' (P21). In the context of downplaying injury, almost all participants described actively negotiating an ever-present 'fear of injury' or 're-injury' (P3) while tackling:

We knew that each other was scared. You just crack on don't you, just play. You internalise a lot of it and then when someone says get off the line, you get off the line...When you are on the pitch you can very easily just be in that environment, zone out of the fear and pretend it's not there. (P18)

Overall, participants' understanding of tackle injury was embodied and constructed through complex negotiations with oneself, interpersonal interactions and with the cultural values (eg, toughness) that they felt defined the sport.

#### 'Women are not conditioned to hit each other': gender and tackle injury risk

##### Gender and tackle injury risk perceptions

Participants' perceptions of tackle injury risk were in many cases, related to meanings associated with gender. Participants acknowledged that friends and family made judgements about the risks associated with playing a 'masculine appropriate sport' (P7). Participants felt conflicted between their agency and others' gendered assumptions of their vulnerability. Gendered language and messaging from coaches were perceived to augment participants' embodied limitations and perceptions of tackle injury risk in women's rugby:

When coaches are teaching tackle tech to boys it's like "okay hit the thing" and there's no soft language, and with girls it's like "oh you won't get hurt" so even framing it in that way you are going to



picture yourself getting hurt. It is using that soft language because it's a woman or girl...Subconsciously you'll have girls thinking of this "brutish physical game" and they will question their ability as opposed to the guys where that is never brought up and it's not given a second thought. (P7)

Participants described 'being at the mercy of the men in the club' (P13) in terms of access to facilities, quality coaching, and support staff stating 'we should just be happy for what we've got' (P4). Experiences of negligent oversight from coaches manifested as 'throwing players into the deep end' (P7) which participants perceived to increase their fear of injury:

Coaches assume that every player has played from a grassroots level and has been through that setup...Women are not men. We don't have traps, the neck strength and also other elements of S&C...it's okay to be scared in the contact situation...There are games where I was absolutely s\*\*\*\*\*g myself...In that situation I don't think we talk about that enough because it is "yeah we play rugby, let's hit each other!" I reckon on any pitch there are half of the players s\*\*\*\*\*g themselves about who is running at them...I think that explains a lot of missed tackles in the women's game...it is natural fear of "you are going to hurt yourself"...I know players who have stopped playing because they're scared, but that is not what they said when they retired Internationally. (P18)

### Resistance to hurting others

Gendered experiences uncovered in the interviews included participants' resistance to 'hurting people' (P18). Inflicting a mild degree of physical pain to the opposition was viewed by participants as a consequence of tackling in rugby, but 'intentionally going out to hurt someone' (P6) was not a legitimate tactic. Resistance to hurting others also extended to fears of injuring teammates which resulted in a reluctance to 'go live' (P5) in training. This they felt contrasted with the motives of 'reckless' male players who 'don't care who they hurt' (P17):

Everyone was like "yes [nickname] that is an epic hit" as you have just broken someone's leg, and heard it break, and they are screaming. That is the element of rugby that is confusing as a player. I was always actually quite scared about hurting people...always had to be aware in training that I would go half effort but in a game, I had to smash people...I was a fearful, scared player most of the time. I cared more about the opposition than me...I absolutely annihilated my body but I did always feel bad for slightly injuring someone. (P18)

Troubled by the prospect of hurting others, participants felt conflicted by gendered messages from coaches that encouraged excessive aggression and hurting opposition in the tackle contest:

I don't think women are really aggressive...there are definitely coaches that I've had in the past that try and teach you and encourage you, motivate you to go into the tackle to hurt someone. "You hit to hurt"... "we need to be more aggressive"...I don't agree with that. Sometimes I try to bring more aggression to it but I never want to hurt someone. (P13)

Overall, not wanting to intentionally hurt other players in the tackle mitigated the risk of tackle injury for some participants. Importantly, the resistance to hurt others clashed with what they perceived as a masculine-type aggression in the tackle, an aggression they felt was encouraged by their coaches.

### 'Just get up and stand in the line': influences on tackle injury behaviours

Participants reported that they were willing to play while injured and 'just get up and stand in the line' (P6). Feeling the need

to play when in pain and while injured were shaped by both personal and subcultural-based concerns that weakness in the face of pain or injury meant that women do not belong 'in a man's sport' (P2).

### Personal influences

The most prevalent personal reasons for playing through pain were 'putting your body on the line for your teammates' (P2):

You know you're hurt but you've got a role to do...the main thing is just not letting your teammates down...I don't really think about winning or losing...it's more like I'm letting down my teammates and I don't want to do that. (P7)

### Subcultural influences

For all participants, tackle injury perceptions and behaviours were clearly embedded in their own subcultural context of playing rugby union. Participants experienced pressure from coaches to sacrifice their bodies for the benefit of the team:

This is four weeks of destroying your body and trying to hold on for dear life until the end of season. (P17)

Conversely, some participants described coaches being supportive of their injuries. The level of support, or pressure, differed among participants and was influenced by factors including coaching style and player and coach relationship:

We were very close with our coach, so we felt comfortable to go to them. You didn't feel shame for being hurt or not feeling comfortable [to play]. (P16)

Importantly, in a subculture which they felt requires and rewards playing while injured for rugby success, many participants provided accounts of differences in the organisation of men's and women's rugby (ie, career pathways, career opportunities and refereeing) that impact women's tackle injury behaviours. Participants reported experiences of 'second rate' (P7) coaches who were perceived to use women's rugby as 'a stepping stone to progress into the higher levels of the men's game' (P18):

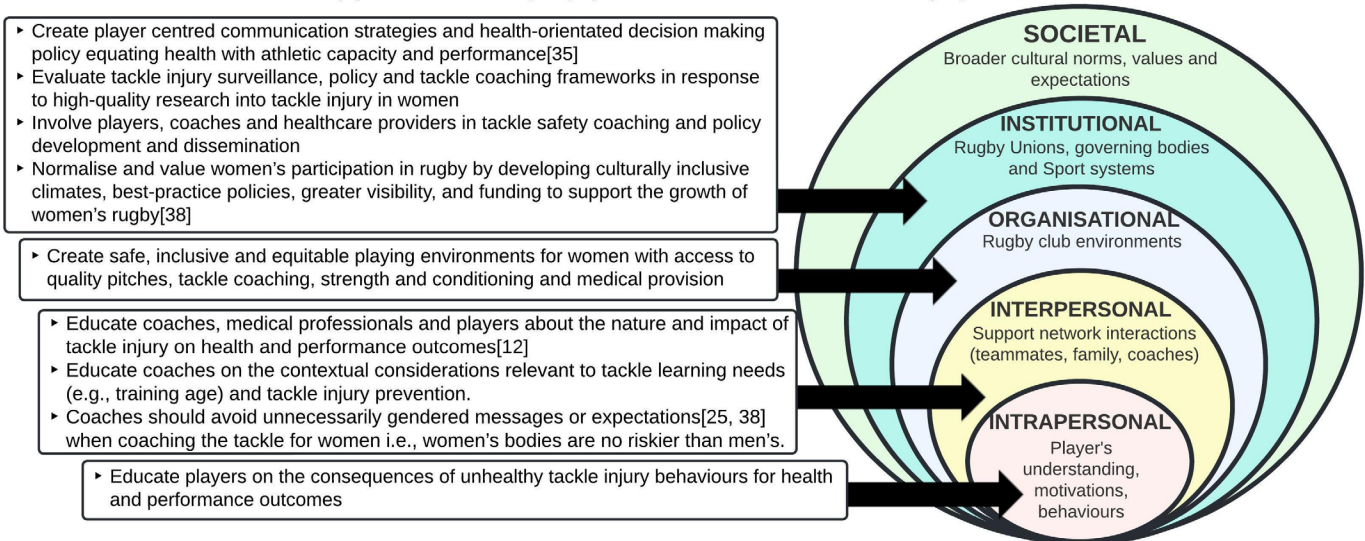
It just stems from where you first learn to tackle...so it's not half-a\*\*\*\*\*g it with a volunteer that doesn't know how to tackle... suddenly teaching young girls this fundamental skill and teaching it wrong. That is going to become a habit and she will carry that through and it's quite difficult to remould it...they [coaches] don't bring out the best in their female players...It's always the bare minimum...you will see under 18 guys have access to really good coaches and specialty coaches and with the girls it's again the same thing of like who's free to volunteer to do it? Getting second rate coaches, because it's fine like "what's the bare minimum that we will accept", so that we won't anger the public if they ever find out. (P7)

### Societal influences

Against a backdrop of constraining gender stereotypes that assume that women rugby players are more injury-prone, 'less skilled' (P1), and 'butch lesbians' (P10), participants reported being systemically marginalised within clubs, unions, and wider society. Consequently, participants felt the need to prove their value through bodily sacrifice to 'make it a product worth selling' (P21) and earn resources aligning with their male counterparts:

There's still a kind of stigma around that because if you introduce yourself to anyone nowadays...you see their eyes widen and they say "touch rugby?"... "is it not sore, doesn't it hurt?" and I don't think men get those questions. They are immediately a superhero wherever they go because they play rugby...but we are on a path of

## Recommendations to support tackle injury prevention in womens rugby union



**Figure 2** Recommendations to support tackle injury prevention in women's rugby union applicable to the socio-ecological model.<sup>9</sup>

making it a product worth selling and worth watching but it's still a far way out...when the quality of rugby picks up and when they see that we can do similar things as the men can do on the field, I think that will definitely make it better. (P21)

### DISCUSSION

The aim of this study was to capture key psychosocial processes that explain tackle injury experiences and behaviours in women's rugby union, from the perspective of women rugby union players. The normalisation of pain within rugby culture was pervasive and compromised participants' physical and emotional health. Participants' understandings of injury risk were shaped by an awareness of the cultural and societal struggles that underpin their involvement in rugby such as the material conditions of play. Gendered embodied experiences forged personal understandings of what was an appropriate level of risk. Participants' desire for respect and recognition in rugby meant that to prove their belonging in the sport, they played through injury and 'put their body on the line'.

Our findings resonate with other sports including football and rowing<sup>12 13 26 27</sup> where the functional definition of injury underpinned participants' irreverent attitudes towards injury. Our findings provide new insight into how injuries are perceived and negotiated in women's rugby. Despite educational campaigns,<sup>5</sup> there was a widely held view among participants that tackle injuries are inevitable and based on performance limitations. While participants used trivialising language to manage their acceptance of tackle injury risk, there was an embodied understanding and bodily negotiation that lay at the foundation of this process. Participants externalised the injured body part, distancing themselves from the physical and emotional consequences associated with it.<sup>28</sup> While participants agreed that injury behaviours are largely the players' responsibility, some critical factors regarding injury risk reduction are out of players' hands (eg, tackle coaching, referee behaviour, and results-driven playing environments). A player's safe tackle technique could be improved through 'boosting' coaching and refereeing competencies.<sup>4</sup> The multiple contextual features of tackle injury perceptions and the inequitable gendered practices that persist in rugby indicate the complexity inherent to tackle injury. Our findings are relevant

for the development and implementation of sports injury surveillance systems and prevention strategies that reflect the centrality of performance in players' definition of tackle injury.<sup>8</sup>

Consistent with other sports, we found that women's rugby union players commonly play while injured and manage injuries through matches.<sup>12 13</sup> Most players felt that they were not pressured into playing with an injury which may be demonstrative of the 'risk-transfer' process in 'sportsnets' (a term for webs of interaction in sport) where athletes believe the decision is made by them, but in practice, is influenced by a myriad of cultural and structural factors.<sup>29</sup> In our study, toughness and behaviours associated with men's rugby appeared to dominate and organise the playing context in women's rugby union. Tackle injuries were normalised for participants and they were encouraged by teammates and coaches to sacrifice their bodies for the benefit of the team. When tempted to express anxiety about their pain or injuries, participants faced retorts from teammates and were advised to continue playing. Support of this kind has the latent function of maintaining the subcultural norms of the 'sportsnet' and regulating risk-taking behaviours. Participants in this study revealed a system of rewards in rugby for adopting the behaviours expected of players.

Participants felt compromised by their tackle injuries and in many cases felt that the prevailing culture and structures did not allow them to disclose their injury fears. Players' internalisation of injury fears resonate with what Goffman<sup>30</sup> refers to as activity at the 'back stage' that is 'inconsistent with the appearance fostered by the performance' at the 'front stage'. Similarly, Sabo<sup>31</sup> noted that "athletes gradually learnt to stifle awareness of their bodies and to limit emotional expression." Extrapolating Sabo's and Goffman's concepts to the issue of downplaying and concealing tackle injury in our cohort, it is not difficult to see how participants are predisposed to not speak up given the cultural permeation of this ideology.<sup>29 31</sup> Conformance to the 'sport ethic' incurs a greater number and severity of injuries<sup>32 33</sup> and may have longer-term implications on player health and well-being.<sup>34</sup> The concept of 'risk transfer' recognises that it is not just athletes who are constrained by the need to perform in sport. Coaches and medical staff are under pressure to produce winning performances which may then create a culture where

the pressure to perform with pain is present. In particular, the specific context of women's sport is heavily dependent on successful performances for commercial success. Such behaviours should be addressed through targeted education for players, coaches and other stakeholders on the health and performance consequences of unhealthy tackle injury behaviours. Excessive social pressure within the sports network could be targeted by establishing health-oriented decision-making regulations and athlete-focused communication strategies.<sup>35</sup>

This study expands on current research by exposing previously under analysed factors such as gender,<sup>25</sup> that significantly impact women's tackle injury experiences. Participants identified how their status as women and late starters in rugby increased their injury susceptibility because of inadequate physical preparedness (eg, younger training age and restricted gym access), technical preparedness (eg, maladaptive coaching practices) and tactical preparedness (eg, game exposure and understanding). Gendered structural barriers such as the unequal distribution of resources influenced participants' tackle injury risk perceptions and behaviours. Financial incentives, injury stigmatisation and deselection were not reported to be relevant to the experiences of women rugby players despite being common behavioural influences in other sports.<sup>12 13 26 27</sup> This may be because women's rugby is striving to reach parity with their male counterparts in terms of commercialisation, participation and professionalism. Consistent with other women contact sports, the participants recounted day-to-day experiences of gender ideologies, stereotypes, homophobia and stigma linked to being women in 'a men's game',<sup>36 37</sup> which left them feeling undervalued, trivialised, and interlopers in their sport. In the face of these experiences, it appears participants were just as willing as their male counterparts to sacrifice their bodies as part of the game. However, their reasons were tied to transgressing inequitable gender practices and reaffirming their belonging in rugby. Institutions and organisations should focus on increasing the number of women with 'a seat at the table' and increase awareness of the implicit gender bias in rugby, taking deliberate actions such as changing policies and systems to create a more equitable, culturally inclusive playing climate.<sup>38</sup> Such action may help combat unhealthy tackle-injury beliefs and behaviours and indirectly benefit tackle injury prevention in women's rugby.

While participants in our study appear to adopt many of the injury behaviours endemic in the men's game,<sup>27 29</sup> they also experienced a form of cognitive dissonance when injuring others. Indeed, concerns about injuring others were nearly as salient as concerns for personal safety, if not more so. Teammates were viewed as family, even to the point that participants highlighted their discomfort with tackling teammates in training. This contrasts with men's experiences, as they often relish such physical contact with friends.<sup>39</sup> This has implications for the design and implementation of tackle coaching strategies in women's rugby.<sup>2</sup> Of note, resistance to the dominant prescriptions of rugby culture was detected, specifically to coach messages of 'hitting to hurt' opposition. Amid media attention on concussion lawsuits in rugby codes, many participants reported modified behaviours as a result of concerns for the long-term brain health consequences of injuries.

### Clinical implications

Our findings reveal that tackle injury experience and behaviour for women players in rugby union is embedded across multiple contexts ranging from the microlevel to the macrolevel. Beyond the stakeholders directly related to the players (eg, teammates,

coaches, family), there are other dimensions (eg, club environments, national unions and wider society) that affect tackle injury experiences.<sup>9</sup> To develop comprehensive injury prevention strategies, all stakeholders should be involved and engaged. While it may not be possible to avoid tackle injuries, based on our reporting of the findings, we outline recommendations to support tackle injury prevention in women's rugby union (figure 2).

### Limitations

The findings of our study are not generalisable to all players in women's rugby and may also limit comparability to other sports and settings. The findings are limited to players from a small number of countries and most participants who were recruited were from Ireland. Data collection was limited to interviews and did not include other qualitative data collection methods (eg, observation, large-scale documentary analysis across contexts). We did not arrive at a theory per se to explain tackle injury behaviours and experiences of women rugby union players. However, using GT methods and procedures enabled the generation of concepts and categories that offer rich explanation of tackle injury in the playing context of women's rugby union. In addition, the study did not incorporate the perspective of male players and other stakeholders (eg, coaches and medical personnel) on the tackle injury. Future research involving the perspectives from these groups is needed to understand how widespread the experience of and behaviours surrounding tackle injury are.

### CONCLUSION

Women's tackle injury experiences were often sources of conflict and fear and were intertwined with the day-to-day realities of marginalisation and underpreparedness. Women were socialised into an understanding that to be accepted and respected in rugby, they must internalise injury fears and conform to subcultural values which reward 'putting your body on the line'. Grounded in the voices of women, we have provided recommendations for key stakeholders to support tackle injury prevention in women's rugby.

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