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If in doubt, sit them out? — Exploring the influence of the 'Recognise and Remove' process on management decisions and player disclosure in community rugby union

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ABSTRACT

Objectives: World Rugby's 'Recognise and Remove' process facilitates immediate removal of players with suspected concussion from community-level games to enhance player safety. The aim of this study was to explore community stakeholders' perceptions of the 'Recognise and Remove' process, and its influence on concussion management decisions.
Design: Pragmatic, qualitative descriptive study.
Methods: This study utilised semi-structured interviews and focus groups with 62 community rugby stakeholders from New Zealand schools and clubs. Reflexive thematic analysis was used to analyse the data.
Results: Four main themes were developed: i) *If in doubt, sit them out*; ii) *hypervigilance and a pendulum that has swung too far*; iii) *decisions have consequences: the influence of uncertainty and pressure*; and iv) *the mandatory stand-down period can be counter-productive*. Most participants emphasised the importance of the process, placing player welfare above all else. However, several participants believed that improved concussion awareness had created hypervigilance which in their opinion is detrimental to the game. Immediate decision-making to remove a player was becoming increasingly challenging under pressure. Finally, the mandatory stand-down period was a primary driver for player non-disclosure, and feelings of stress experienced by team leads/physiotherapists when uncertainty surrounded the suspected concussion.
Conclusions: Most participants emphasised the importance of the 'Recognise and Remove' process. Yet, a concerning subset of participants expressed dissatisfaction with the process, leading to hesitancy when deciding to remove a player from the field. Collaborative strategies to improve stakeholders' acceptance of the process are critical to avoid unintended consequences.

Practical implications

- Well-intentioned concussion policies may have unintended implications in the community game, including the promotion of non-disclosure. To promote safe and sustainable community rugby practices around concussion management, stakeholder views and real-world implementation must be evaluated as national guidelines evolve.
- Implementing an 'assumed concussed until proven otherwise' approach could provide more flexibility for players, whilst digital pitch-side report could help ensure continuity of care and support decision-making.
- Due to limited access to concussion specialists, the supportive role of other healthcare providers, such as physiotherapists, should be further explored.
- Improving concussion management requires a collaborative approach, including educating players and parents, fostering supportive team environments, and using role models to promote safe practice.

1. Introduction

Long-term health consequences of concussions in contact sports are a growing concern. Rugby union (henceforth rugby) has one of the

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highest concussion incidence rates for contact sports.[1] In school and senior-level male rugby players, concussion incidence rates range between 3 and 4 concussions per 1000 player-match-hours, and 6 to 8 concussions per 1000 player-match-hours in female players.[2] In New Zealand, approximately 137,527 males and females play rugby, and the sport accounts for 53% of all sports-related concussions in adults over 16 years of age.[3,4] Similar to other contact sports, rugby has grappled with balancing player welfare with player performance and the need to win.[5,6] In the past, players often continued playing after potential concussive events.[7] Although concussion management has improved in recent years,[8] non-disclosure still poses prevalent concerns in rugby.[9–11]

World Rugby's "Recognise and Remove" community rugby recommendation calls for the immediate removal of players who have sustained a suspected concussion to ensure player safety.[12] Continuing to play through a suspected concussion can prolong recovery time and increases the risk for persisting symptoms or, in rare cases, second impact syndrome.[8,13] Players who continued to play for 15 min post-concussion took twice as long to recover than players who were removed immediately,[14] whilst early initiation of post-concussion clinical care is associated with faster recovery.[15] To operationalise the "Recognise and Remove" process, New Zealand Rugby (NZR) developed and implemented a concussion management pathway (CMP) to support community-level players with safe recovery and return to play, as described in Appendix A.[16] As part of the CMP, and at the time of this study, NZR had a mandatory minimum concussion stand-down period (SDP) for the community game that was set at 23 days for players under 19 years of age (U19), and 21 days for those aged 19 and over (19+). Historically, evidence regarding the optimal timing for return to sport following concussion has been inconsistent. On average, athletes report symptoms for approximately 14.0 days.[8,17] Among individuals aged 13–18 years, the average duration until symptom resolution is 16.2 days, whilst for females within this age group, the mean time to become symptom free extends to 24.1 days.[17] Unrestricted return to sport after concussion typically occurs within one month of injury for both adolescents and adults, with an estimated pooled mean of 19.8 days.[17] Subsequently, the SDP has been revised to 21 days for all players, irrespective of age, across all sports in New Zealand according to the guidelines issued by the Accident Compensation Corporation (ACC)[f] and in line with World Rugby's current mandate for the community game.[12,18] These mandates were developed with the intent of safeguarding player welfare—particularly at the community level, where access to medical care and support staff may vary.

Translating these concussion management guidelines into real-world practice in the community is challenging.[19,20] In elite rugby, the Head Injury Assessment (HIA) process consists of three time-based medical assessments: an initial on-the-pitch assessment, a follow-up post-game assessment, and a third assessment within 36–48 h.[21] In contrast, in the community, pitch-side medical care is often limited, and the decision-making process lies with the person removing the player from the field, namely coaches, team leads, referees, and physiotherapists.[13] These stakeholders often have varying levels of knowledge and experience.[13] Their role is not to diagnose concussions, but to identify and remove suspected cases. Concussions are difficult to diagnose even for medical professionals, signifying the complexity facing non-medical stakeholders tasked with removal of suspected concussions on the pitch.[8,13] This complexity necessitates a precautionary approach that keeps players safe, even if that means at times, players who are eventually cleared of a concussions are removed. In addition, compliance to the mandatory stand down period is based on trust and honesty. It is therefore important to explore underlying attitudes and beliefs that drive concussion-related initiatives such as the 'Recognise and Remove' guidelines. This study aimed to explore community stakeholders' perceptions of this process, and its influence on concussion management decisions.

2. Methods

2.1. Design

This pragmatic, qualitative descriptive study forms part of a broader, multi-year evaluation of NZR's Community Concussion Initiative[22,23] with the purpose of providing practical solutions to real-world problems.[24,25] The design and implementation of the CMP were informed by a systems thinking approach, which means stakeholders' decisions and behaviours across different levels of a community rugby system (including players, coaches, medics, and administrators) should be considered when investigating the management of concussion.[26,27] Following the 2022 rugby season, semi-structured interviews and focus groups were conducted to explore stakeholders' concussion perceptions and experiences of the CMP.[28] The combination of two methods of data collection (interviews and focus groups) reflected a pragmatic approach and was employed to facilitate maximum inclusion of participants across different stakeholder groups.[29] This study reports on the analysis of a specific portion of data collected during this study, namely participants' perceptions of the Recognise and Remove process. Approval to conduct the research was obtained from the University of Otago Human Ethics Committee (approval 18/087). All participants provided informed written consent. Written consent was obtained from their parents/caregivers for players aged below 16 years.

2.2. Data collection

Semi-structured questions were formulated by members of the interdisciplinary research team (MB, DS, and SW) to investigate participants' experiences with concussion management. Interview schedules used in the current study were adapted from previous studies evaluating the CMP conducted in 2018/2019, as well as from insights gained during subsequent evaluation of the 2018/2019 findings.[26,30] Additional questions were incorporated to examine participants' perspectives on risk, prevention, and the on-field management of concussion in greater detail (see Appendix B). The same question topics were covered in both the interviews and focus groups. Questions were adapted according to the specific roles/context of each stakeholder group. The questions utilised in this study were pilot tested within the broader research team and altered according to feedback.

Purposive sampling was used to recruit players, coaches, provincial union representatives, school/club sport administrators, team leads (managers), nurses, physiotherapists and general practitioners (GPs) from four provincial unions in New Zealand actively participating in the CMP. Individual interviews were offered to stakeholders who were unable to attend a focus group session due to scheduling and time constraints.

The data collection team, comprising three females and three males, was responsible for implementing the CMP across various provincial unions. This research team held BSc, MSc, and PhD degrees and was actively engaged in rugby health and welfare research and clinical activities. No prior relationships existed between the researchers and participants. To facilitate consistency, experienced qualitative researchers (PhDs) from the broader project's advisory team trained the data collection team on interview and focus group facilitation techniques, including probing questions and paraphrasing, before conducting interviews and focus groups.

Focus groups comprised 3–4 participants from similar stakeholder groups (e.g., players, coaches). We included the nurse participant in a focus group with physiotherapists due to their shared workplace. We opted for smaller groups as these were logistically easier to arrange and would, in our opinion, be more time efficient for participants. Authors have argued that the group dynamics in smaller groups still

[f] New Zealand's universal no-fault injury insurance.

facilitates participant interaction, a distinctive feature of focus groups.[31] Smaller focus groups may provide greater opportunity for participants to describe their experiences in depth. Despite the small size of each group, our total of 12 focus groups ensured a broad range of views.

Sixty-two participants were included in the study (Table 1). Focus groups (n = 12) and semi-structured interviews (n = 22) were held at familiar locations (i.e., school or rugby club) at convenient times. Interviews and focus groups were audio-recorded and lasted between 40 and 75 min.

2.3. Analysis

Reflexive thematic analysis was used to analyse data.[32,33] Audio-recordings were transcribed verbatim and organised in NVivo 14 (Lumivero, Colorado). The analysis process was undertaken by the first author, using the wider research team as a sounding board. Firstly, transcripts were read, and notes added about potential codes. A subset of transcripts was coded by a second coder to generate discussion around codes and their meaning. Thereafter, data were coded inductively and developed into initial themes. Stakeholder groups were coded separately. During the analysis, we sorted and collated codes from across all stakeholder groups into themes and sub-themes. We highlighted individual stakeholder groups within themes when specifically relevant. In addition, we considered how the data from interviews and focus groups compared and contrasted, and finally focused on the convergence of the central themes identified across both datasets. Initial and final themes were considered in relation to the coded data and the overall dataset, and reviewed in regular research team meetings, until the team was satisfied that the themes contained a comprehensive description of the data. Aligning with Braun & Clarke, we agree that a theme's importance relies more on its relevance to the overall research question than on quantifiable measures (such as the number of participants who expressed the same view).[33,34] Similarly, we believe the concept of data saturation is not a universally useful concept for all types of qualitative research and that new insights may be developed as long as data is being collected.[34–36] Instead, our focus was on a reflexive and iterative analysis of the data collected.[35]

2.4. Rigour, trustworthiness and reflexivity

From a relativist perspective to rigour and trustworthiness, the criteria for evaluation should be study specific.[37] The need to contribute in a practical way to the prevention and management of rugby-related concussion in NZ informed the design not only of the current study but the broader project as a whole.[29] As such, adopting a pragmatic approach underpinned decisions around study design, data collection and analysis. Methodologically, the use of both focus groups and individual interviews provided complementary data. Whilst individual interviews facilitated a deeper exploration of an individual's experience, the focus groups capitalised on spontaneous interaction and collective reflection among participants who were already familiar with one another. Similarly, it was important to us that the findings were explored in an iterative and transparent manner. Thus, regular team meetings were held to discuss the analysis process and findings, to test assumptions, and to facilitate coherence in our interpretation.

From a pragmatic perspective, multiple realities exist, with these realities being created as individuals interact with their social world.[25] Similarly, researchers' beliefs and values inevitably shape how they perceive the world and how they approach and interpret research. Our research team members are all passionate about rugby, but we are also equally committed to player welfare, and this is the lens through which we approach our research. We believe the interdisciplinary nature of the team facilitated discussion around meaning, challenged individual assumptions and interpretation of data and contributed towards a rich exploration of the data overall.

Table 1
Sample description (n = 62).

Stakeholders	N	Age		Sex (n)		Level (n)	
		Mean	Range	Male	Female	School	Club/ premier
Team leads/managers	4	50.3	31–63	2	2	3	1
Coaches	8	42.3	33–61	7	1	4	4
Parents	3	49.3	41–53	2	1	3	0
Physiotherapists	6	27.6	23–38	4	2	1	5
Players	23	17.3	13–25	14	9	13	10
Provincial union representatives	6	41.0	32–54	5	1	–	–
School contacts	5	48.8	24–68	3	2	5	0
General practitioners	6	50.6	32–66	4	2	–	–
Nurses	1	38.0	–	0	1	1	0
Total	62			41	21	30	20

3. Results

Four overarching themes were developed (Fig. 1).

3.1. If in doubt, sit them out

Most coaches, team leads and physiotherapists reported strictly adhering to the 'Recognise and Remove' process for suspected concussions. They prioritised player welfare, irrespective of pressure from others to keep a player on the field.

> *They can be assessed by a doctor who is legally qualified to diagnose concussion afterwards, and if they are cleared by that person, that's fine. But I think if you've got a suspicion…pull them off…it's fairly black and white.*
>
> [A6 Physiotherapist]

Actioning this procedure was easier if the team and management were on the same page about removing players, without hesitation.

> *Interviewer: Is there anything you think as a coach you have the capacity to influence or make a change in?Coach: It would probably be the attitudes of the other management in my group, just around if we do see a concussion and it isn't really clear cut, they're out. There's no wiggle room.*
>
> [B6 Coach]

Physiotherapists reported that their decision was easier if it was supported by other physiotherapists or medics, and that there was a structured protocol that facilitated their authority.

3.2. Hypervigilance and a pendulum that has swung too far

In contrast, some felt that efforts to improve concussion awareness had created a new problem, with some coaches, physiotherapists, team leads and players now being "over-aware" and thinking "every knock is a concussion".

> *I think there's a fine line and you can overdo it a little bit. And so, they'll get a little knock and then all of a sudden "I'm concussed", and quite frankly they're not.*
>
> [C11 Coach]

These participants felt that over-reporting was occurring which negatively affected teams, the game, and the load on persons responsible for players, including coaches.

> *Player welfare's always been number one, but the exposure that concussions have now, has been really good for the game and also really bad.*

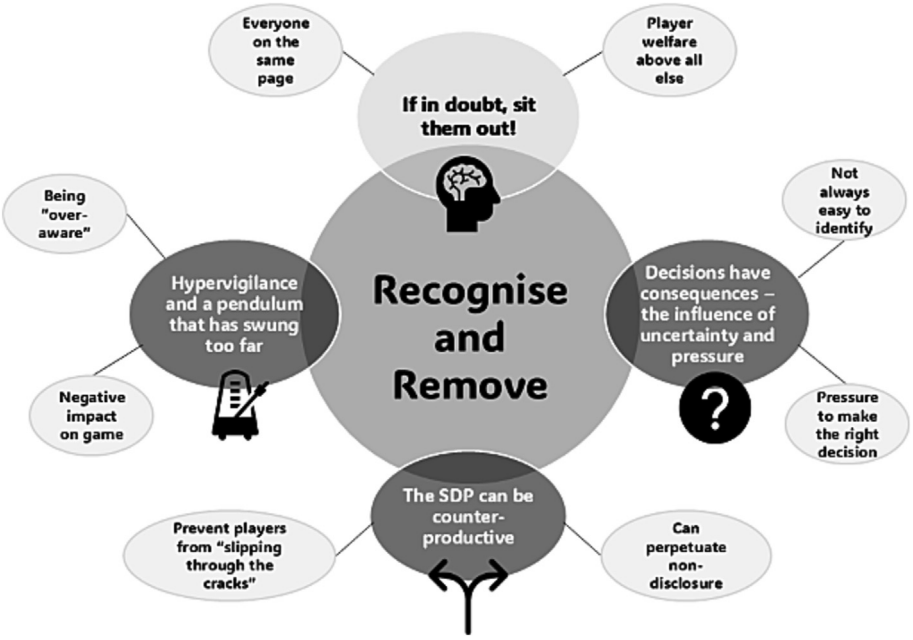

Fig. 1. Participant perceptions of the 'Recognise and Remove' process, and its influence on concussion management decisions.

The other week a kid came up to me saying, "Oh, I've got a headache, I'm dizzy." And things like that and so, "Okay mate, we'll just watch it." And then the principal comes up to me and he goes, "Oh, we need to get this guy at the hospital." I'm like, I'm thinking in my head I'm going, "Well do we?," and this is bad, because it's player welfare, but I'm going, "Do we hold everyone up to get this kid to a doctor, who's just going to say he's concussed, or he is not concussed?" The problem was then, our principal was going to me, "Well what if this kid's brain bleeds, and he dies on the bus…"

[D6 Coaches]

Although physiotherapists and general practitioners were inclined to prioritise player welfare over the game, some expressed their concern over the consequences of 'over-reporting'.

I'm not sure what percentage of people that I see, particularly from high school level actually have a head injury, as opposed to bumping their heads and feeling a bit jaded by it…. I see what happens on the field and there's a very low threshold for pulling a child off. I try and reconcile that with the fact that kids participating in sport is becoming a more and more difficult area and everybody you speak to involved with kids' sports teams are finding it harder and harder to put teams together. For instance, we've got schools in [area] with over 3000 kids and they can't put enough kids together for even one team, let alone two teams. So there's a lot of kids leaving Rugby…

[A15 GP]

3.3. Decisions have consequences: the influence of uncertainty and pressure

Some players reported having previously sustained a concussion increased their confidence with regard to recognising symptoms. Similarly, physiotherapists and team leads noted that recognising suspected concussion became easier with experience, particularly when they knew their players well. Whilst participants easily identified obvious concussions, they struggled with subtle or delayed onset symptoms, or when players denied symptoms. Despite understanding basic concussion presentation, some participants across all groups reported knowledge gaps and challenges applying classroom education to game situations. The variable nature of concussion symptoms complicated identification beyond just knowledge limitations.

Sometimes when they get a knock, they don't think anything of it because rugby is full of knocks, but it's the severity of the knock that can be the problem. And sometimes I don't think students can tell the difference. Any knock doesn't necessarily mean a concussion.

[A9 Team leads]

Team leads and physiotherapists reported pressure and challenges with immediate player removal decisions. The uncertainty regarding suspected concussion signs, and players' honesty and cooperation, added to the pressure and stress. Participants worried about making incorrect decisions that could result in unnecessary player removal or placing a player's safety at risk.

Yeah, sometimes you doubt whether it's a concussion, because you're being over-cautious…And you can get a head knock and it's not a concussion, and that's a really hard thing to determine, especially when you don't know how honest the players are. And you don't want to say, "Yes, it is a concussion," when it's not, and then they're out for 23 days. I find that quite tricky sometimes. And sometimes you can get them to go to the doctors, even though I doubt that it was a concussion, the doctors will always say it's a concussion and I'm wondering whether they're erring on the side of caution as well, which is really, really hard. We might be pulling these kids out from playing when in actual fact they would've been fine, and maybe that's why some kids don't report it, because they're thinking, "Oh, I'm actually ok and, I don't want to be put out for not the right reason."

[C6 Physiotherapists]

*It's pretty hard for a physio because you're like, f*** this is a big call to make, because especially if it's one of your marquee players, you know what I mean? You're like, sh**, I don't want to bring him off. So it's quite tough, man.*

[A10 Physiotherapist]

Their hesitancy for player removal could be exacerbated by pressure or anger from coaches, parents or players.

And I went over to the guy and asked him the SCAT questions, which he was able to answer. But the information I got from another person was that he was kind of dazed. So he passed the SCAT questions, and I, watched him for a bit and then I was like, "He's not quite right, I'm going to remove him from play." And then I got a bit of an earful from the coaches saying, "What's going on? What's going on? He passed the SCAT questions!" And I was a bit hesitant. I was maybe a little bit, "Oh, should I take them off? Should I keep them on? Should I take them off?" I decided I'd take him off. And I think that was a good thing to do, but it was maybe a bit of a more for me to have confidence in my decision and to just think once again, step outside of the situation and be like, it's about the player and what they need and their health. I think it was an easy way to make that work a little bit better. And to take that confrontation, that flack and maybe how you feel afterwards.

[B4 Physiotherapist]

Physiotherapists and team leads relied on the honesty of players to come forward. However, players also reported finding it difficult during a match to identify their own possible concussion.

Player A: Yeah, just people don't realise that it's bad. Often, you don't realise you've had a head knock and if it doesn't get seen by anyone else, you don't actually know until after the game and you're like, "Oh, wait. I don't actually remember the game." Because you could be in a pretty 'out of it' space after that knock.Player B: Yeah, sometimes, you yourself don't even realise until later when you've got the blurred vision, and you're feeling sick. That's often, if you don't get knocked out from the concussion, you think, because quite often at rugby, you'll get the little bumps that sort of daze you a bit, but that's not a concussion, and sort of trying to work out yourself when it's actually a serious one, when it's doing damage.

[C2 Players]

This uncertainty, coupled with pressure experienced in the moment of the game, resulted in some players not disclosing their symptoms; whilst on the field, continuing to play seemed more important.

Well, I mean, I wouldn't want to come off unless I was passed out. So yeah, I feel like it's not a pressure from anyone else. I feel like people on the sideline would want people to come off whenever they might be concussed, but I know if I was playing, I wouldn't want to go off. So I'd just not say anything, unless it was real bad.

[C3 Player]

For players, non-disclosure was related to fear of missing out, being 'tough' or competitive, wanting to prove themselves (especially younger players), or important games (especially televised games).

Player A: I suppose in that instance, then that's probably the last thing on your mind is… It sounds pretty bad, but player safety now in that situation's probably not the big priority. In a training, you can just very easily stop whatever drill you are doing. But in a game, you know are all fired up.Player B: Adrenaline as well.Player C: Pressure, people are watching.

[C4 Players]

In a team you don't want to be seen as a weakling. So if you've got an injury, you don't want to say it out loud and hopefully no one's seen it.

[B1 Player]

External pressure was related to not wanting to let the team or coaches down, or when the team didn't have enough substitute players. At times, parents, coaches or teammates pressured players to 'harden up'.

Parents have sort of said, "Oh, it's just a wee bump, harden up, carry on. You're not dizzy, you're not sick, you're not showing any symptoms." I think it's probably quite heavily weighted on the parents, some parents are like, "No, no, he'll be fine. Push on," because they [are] sort of playing rugby through their kids.

[C8 Parent]

3.4. The SDP can be counter-productive

The rigid SDP was a primary driver of players concealing symptoms and creating pressure on team leads and physiotherapists to avoid removing players when there was uncertainty around the suspected concussion. Team leads and physiotherapists were concerned that subjecting players to the SDP when they were asymptomatic or disputed being concussed would lead to future non-disclosure.

Well, to sit out 23 days sucks. I shouldn't say this, but I was like, "Man, I wish I just said nothing." If you are fine a few days later, then it's like, "I'm just sitting out for the sake of it."

[C3 Player]

Whilst not shared by all participants, some participants advocated for SDP modification to a more flexible approach, particularly when uncertainty existed. The possibility of assessment without a mandatory SDP would improve disclosure. Flexible recovery pathways could allow early clearance for players who recovered before the SDP ended. Physiotherapists should be allowed more assessment time during matches to decide if players should be removed or to monitor them for longer periods.

I think just if there's a process in place around those unsure head knocks. So, if they [players] knew that they're not straight away out for 23 days…I think that'll help big time around people putting their hand up and going off.

[C5 School contact]

Other participants recommended the pre-cautionary approach as the risk of missing a concussion outweighed concerns about players having to complete unnecessary SDPs. GPs, in particular, promoted a standard SDP to avoid conflict and ensuring players' concussions were not missed. Some participants felt that players should not be responsible for reporting symptoms as they could be confused, uncertain or reluctant to disclose symptoms. Instead, teams should allocate supervisors to observe players throughout the game and remove those with suspected concussion. Some participants believed creating a supportive player welfare culture would encourage players to report symptoms despite rigid SDPs.

If no one picked up that he's got a bit of a knock, then it really comes down to him [the player]. It needs to be said at the start of season, "If you do get a head knock you need to tell us. It doesn't matter if it's the week before final, your health and safety comes before any result." And I think they need to know that and know that we do care about them.

[C10 Coach]

A supportive team environment should also enable players to support each other. Favourable examples set by role models, coaches and parents should work towards normalising disclosure.

Parents should be discussing it with the players, even at the team level with the coaches, just so that if it's always discussed, it's always a

normal part of it. It's no big deal to put your hand up and say, I've had a knock, I need to have it looked at.

[D4 Parent]

However, participants also noted that adequate awareness and knowledge about concussion symptoms were required alongside a supportive team environment to encourage players to report symptoms even if uncertainty existed.

4. Discussion

The aim of this study was to explore community stakeholders' perceptions of the 'Recognise and Remove' guidelines, and its influence on concussion management decisions. Four main themes were developed, describing challenges and complexities of applying these guidelines in community-level rugby. The first theme 'if in doubt, sit them out' represented perspectives of participants who believed that a player should be removed with any suspicion for a concussion. Existing research reinforces the importance of early recognition, immediate removal, appropriate care, and recovery.[8] For these participants, on-field decisions were influenced by the belief that player safety was paramount. This approach was associated with clear (and simple) decision-making (if any doubt, remove), protecting team leads, coaches and physiotherapists from having to definitively identify a concussion.[13] However, under the second theme, 'hypervigilance and a pendulum that has swung too far', some participants expressed concerns regarding the increased awareness around concussion resulting in over-reporting and unnecessary stand-downs. According to these participants, this mindset is detrimental to the game and participation rates and could contribute to players' non-disclosure. They suggested that, players may once again revert to adopting a 'warrior mentality' — an issue that proponents of player welfare have fought hard to counter.[5,6,38]

4.1. Concussion symptom disclosure

Concussion symptom disclosure becomes a dilemma when a player suspects they have sustained a concussion, but also worries that disclosure could have negative consequences.[39] The desire to play represents a fundamental underlying motivation that informs the player's decision-making process.[38] Social norms, the importance of the game, perceptions of a potential threat to success, and the 'concussion sense making' (the degree to which players can recognise and act on signs and symptoms of concussions) also contribute to the player's reporting decision-making.[38] The underlying problem may be related to difficulties with identification and diagnosis of concussions.[8] As reported elsewhere, our players noted that their uncertainty about experiencing a suspected concussion often resulted in non-disclosure.[10] The severity of the injury, concussion history, and previous experiences also contributed to players' disclosure decisions. Athletes with a concussion history may be less likely to disclose a subsequent concussion, especially if they consider their current concussion to be less severe.[40]

Overall, these factors highlight the need to promote concussion disclosure. The presence of medical professionals can improve disclosure by acting as a liaison and advocate between coaches and athletes.[41] However, our findings suggest that individuals responsible for making 'Recognise and Remove' decisions often felt uncertain, particularly when the signs of concussion were unclear. Several team leads and physiotherapists reported increased pressure or stress to make removal decisions under these conditions. This is concerning, as research suggests that when patients perceive uncertainty from medical professionals, their own confidence in the diagnosis may diminish.[42] This is not uncommon; medical professionals have consistently expressed doubt about their concussion knowledge, difficulties in diagnosing concussion, and negotiating tension between themselves, players, coaches, and parents.[23,42] Pressure to make timely decisions reflects the interdependence of medical professionals within a broader network of relations of sport administrators, where maintaining respect and authority in their teams is essential.[42] In our study, this observation also includes team leads, managers, medics, and coaches tasked with on-field player safety. These relational dynamics, combined with the inherent complexity of concussion, create significant challenges in decision-making. Interventions that strengthen confidence in concussion identification may help mitigate these issues.

Kerr et al. found that much of the concussion disclosure literature focused on intra-personal and inter-personal levels, with less emphasis placed on the influence of environment and policy.[43] This gap is reflected in our findings, particularly in the final theme. Despite the well-intentioned phrase "if in doubt, sit them out" widely recommended by rugby unions, participants expressed concerns that the inflexibility of the SDP may deter future disclosure. Over time, dissatisfaction with the rigid nature of the SDP appears to have eroded trust in the process for some community stakeholders. Several participants described a shift: players who once disclosed symptoms were now more hesitant, fearing what they felt (or did not feel) would potentially result in unnecessary exclusion from play. This has serious implications for the integrity of concussion management and highlights the need for strategies that both support accurate decision-making and foster a culture of disclosure.

4.2. Improving the acceptability of the 'Recognise and Remove' process

Successful protocol adoption is influenced by end-users' perceptions of their value relative to existing practices.[44] Whilst the mandatory SDP is required by the sport's governing body, implementation and compliance remain challenging at the community level. If the protocol is perceived as overly rigid or punitive, players and coaches may attempt to circumvent it—undermining its intended purpose and contributing to a culture of non-disclosure.[19,45] Thus, improving the acceptability of the 'Recognise and Remove' process is essential. In the elite game, the HIA protocol affords the player with the possibility of returning to play following the HIA2 and HIA3 (if confirmed not concussed), which may assist with player disclosure and with doctors feeling confident that they can remove a player without the stakes being so high (i.e. facing a 21 day SDP). However, the HIA protocol is complex and applying similar processes at community level would be extremely challenging. Barriers include lack of access to experienced doctors, complexity in diagnosing concussion in a primary care setting and access to video review.

Adopting an 'assumed concussed until proven otherwise' approach, that necessitates a diagnosis by a GP within a few days following the event, could provide flexibility in terms of the SDP. The inclusion of a digital pitch-side report that can be easily generated and presented to the assessing medical practitioner could help ensure continuity of care and provide clinical context for decision-making during the SDP, particularly as symptoms may diminish by the time a player is reviewed by a GP. However, limited access to concussion-knowledgeable community GPs in some regions of NZ presents a significant barrier.[23,46,47] Physiotherapists are frequently providing informal diagnoses for sports-related concussions in community settings due to these access issues.[47,48] Similarly, GPs participating in the CMP have suggested that other healthcare providers could support GPs with the formal diagnosis.[23]

In the community game, concussion management is influenced by the actions and behaviours of multiple stakeholders, across multiple levels of the community rugby system.[26] Inherently, this means there are gaps where a player's concussion can be missed, and as such, the precautionary approach remains paramount. Collaborative strategies to build trust and buy-in towards the process must be prioritised. These include engaging respected role models, such as elite players and coaches to address and promote safe concussion practices and encouraging coaches to foster team environments that support

open reporting and adherence to concussion protocols. 'Concussion discussions' with players (and parents) at the start of season could help to manage expectations and clarify the team's roles/responsibilities around the 'Recognise and Remove' process. In addition, education strategies must continue to evolve to support 'Recognise and Remove' decisions. The gap between recognising obvious concussion symptoms and understanding more subtle or complex aspects of concussion highlights a difference between surface-level knowledge and in-depth knowledge. Incorporating real-world video examples into education modules could help stakeholders better understand clinical signs and symptom presentation and key decision points. Furthermore, additional trained 'concussion spotters' may be of value, and the feasibility of such a strategy should be investigated.[49]

Since this study was completed, there have been notable developments in concussion policy. In 2024, national sport concussion guidelines introduced a 21-day SDP across all sports in New Zealand.[18] These guidelines have been widely communicated to sporting bodies, physiotherapists, and general practitioners. Future work should investigate whether the perception of the SDP has shifted now that the policy is standardised across all codes.

4.3. Limitations

This study acknowledges several limitations. The sample sizes within certain individual stakeholder groups were relatively small. Nonetheless, we do believe that these participants held highly relevant and rich information, and the quality of the data collected was high.[50] Whilst the primary objective was to identify themes across a community rugby system, further detailed investigation of specific stakeholder groups would be beneficial to elaborate on these findings and discern potential differences between groups. The number of participants in some focus groups was limited, which may have constrained the diversity of perspectives represented. Nonetheless, the considerable total number of focus groups, supplemented by individual interviews, provided a broad spectrum of viewpoints within the practical and logistical constraints of data collection. Our intention was to offer a coherent account of participants' experiences relevant to our research question. As the study exclusively involved participants associated with the CMP, these results may not fully represent the concussion perceptions of individuals outside the CMP or in other sports. Future research is warranted to extend these insights.

5. Conclusion

The complexities surrounding the 'Recognise and Remove' process in community rugby underscore the need to better understand how non-medical stakeholders make concussion-related decisions, and to strengthen the educational and structural support available to them. A range of interrelated factors—including the desire to continue playing, concerns about removal, and ambiguous symptom presentation—create a difficult environment for players to self-disclose. Medical and support personnel play an essential role in this dynamic; however, their own uncertainties may further hinder effective management and communication. Whilst well intentioned, rigid implementation of concussion protocols – such as the SDP – may have unintended consequences in the community game, particularly if they foster a culture of non-disclosure. Moving forward, encouraging open communication, building stakeholder confidence in symptom recognition and the process overall, enhancing stakeholder education through tools like real-world video examples, integrating pitch-side reporting to improve clinical handover and facilitating timely and equitable access to appropriately trained healthcare providers should be prioritised. As national guidelines evolve and standardise concussion protocols across all sports, ongoing evaluation of stakeholder perceptions and real-world implementation will be vital to promoting safe and sustainable outcomes in community rugby.

CRediT authorship contribution statement

JR, SW, DS and MB were involved in conceptualising the overall study design. MB was responsible for data coding and analysis. All authors were responsible for the interpretation of the analysis. All authors were involved in editing drafts of the manuscript.

Confirmation of ethical compliance

Approval to conduct the study was granted by Otago University Human Research Ethics Committee (18/087).

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Declaration of interest statement

DS, KR and JR were employed by New Zealand Rugby (NZR) at the time the study was conducted.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jsams.2026.02.011.

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