






Sport, healthcare and educational organisations' perceptions of a framework for managing concussion in New Zealand schools: a qualitative study

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ABSTRACT

Introduction. Concussion guidelines exist for Aotearoa New Zealand schools for safe return-to-learn/sports, yet are infrequently implemented. We previously co-designed a framework for managing concussion in schools with school and sports stakeholders and students with concussion and their parents, and piloted the framework in 12 schools. **Aim.** We explored perceptions of key national, regional, and local stakeholders regarding the value of a FRAMework for maNaging Concussion in Schools (FRANCS) and develop recommendations for wider-scale implementation. **Methods.** Using Participatory Action Research, we invited representatives from national and regional healthcare, education, and sporting organisations to participate in semi-structured interviews and focus groups. Forty-five participants were included, and we used thematic analysis for the data. **Results.** We defined three main themes. The first theme, 'the school-sport-healthcare nexus', describes the intersection of existing school, sport, and healthcare contexts for management of students with concussions. The second theme, 'FRANCS opportunities and refinement', centred on participants' perceptions of factors of the framework that may influence its implementation. The third theme, 'making it work on a larger scale', related to the need for coordinated efforts and collaborations among various agencies and stakeholders to support a national roll-out. **Discussion.** Participants believed there was high value in a national adoption of FRANCS to address significant challenges faced by schools in supporting students with concussion. Competing priorities, concussion knowledge and beliefs, resources, and existing policies were identified to potentially influence wider implementation.

Keywords: concussion, education, implementation, perceptions, return to learn, return to sports, secondary schools, sports organisations.

Introduction

Adolescents with concussion miss more school days and have higher perceived academic difficulty compared to those without concussion.¹ Early individualised concussion care is associated with faster recovery²⁻⁵ and full return-to-learn is a priority before return-to-sport.⁶ Despite the availability of concussion guidelines, implementation in schools is infrequent and inconsistent, including in Aotearoa New Zealand (NZ).^{7,8} Implementation challenges for return-to-learn guidelines include lack of school policy, poor staff concussion knowledge, and inadequate communication processes.⁹⁻¹¹

In 2021, we co-designed a FRAMework for maNaging Concussion in Schools (FRANCS) to support students' return-to-learn and sport/activity.^{12,13} We invited school stakeholders to discuss challenges they faced supporting students with concussion and to consider how they would visualise an optimal process. The framework could be tailored to different schools' resources and capabilities, leading to seven main implementation components (Box 1). We piloted the framework in 12 NZ schools in 2022-2023.¹³

WHAT GAP THIS FILLS

What is already known: We had co-designed a framework for management of concussion in Aotearoa New Zealand secondary schools with school stakeholders and students with concussion and their parents.

What this study adds: Participants from national, regional, and local sports, education, and healthcare organisations suggested that the framework would be of high value to address inconsistent implementation of post-concussion student support, and provided recommendations for wider implementation.

Designing a concussion management framework within a complex, country-specific educational system necessitates collaboration and input from all stakeholders.^{14,15} In this study, we consulted with relevant national and regional healthcare, sports, and education organisations with key relationships with the school sector. The aims of this study were to explore those stakeholders' perceptions of the value of FRANCS, identify recommendations to improve the framework, and provide insights to inform potential wider-scale implementation.

Methods

Design and ethics

The protocol of the broader Community Based Participatory Action Research (CBPR) project has been published.¹³ The University of Otago Human Ethics approved this study (HE21/004) and all participants provided informed written consent.

Participants

We identified relevant national and regional healthcare, education, and sport organisations, inviting representatives via adverts or emails of the organisations, or to individuals

known to the researchers. We used a purposive and snowball sampling approach, inviting participants to recommend other organisations and representatives (Table 1).

Procedures

We designed a semi-structured interview guide relevant for the study's aims (Supplementary File S1). Five female research team members with extensive qualitative interviewing experience, holding doctoral degrees, conducted six focus groups, six dyadic interviews,¹⁶ and 11 individual interviews (total of 45 participants) via Zoom or in person. The combination of methods of data collection reflected a pragmatic approach and was employed to facilitate maximum inclusion of participants. We emailed the current FRANCS documentation to participants prior to interviews/focus groups and provided them with a 10-min verbal overview of the framework at the start of the interview/focus group (typically lasting 20–70 min).

Analysis

Audio-recordings were transcribed verbatim using otter.ai (<https://otter.ai/home>), verified by team members, and imported to NVivo (Lumivero). We used reflexive thematic analysis, which offers a systematic yet flexible approach to coding and theme development.^{17,18} As a first step, three authors read each transcript to become familiar with the data and to compile notes about potential codes. We then independently coded (inductively) a subset of transcripts and discussed the coding of each transcript. The remaining transcripts were divided and coded inductively by each coder. Codes across the dataset were sorted, collated into themes, and presented for stakeholder groups as a whole. We met weekly to discuss and refine coding, iteratively developing categories and themes until all transcripts were coded. The coders' understanding of the data was discussed through regular meetings with the broader research team and refined until the team was confident the themes comprehensively described the data. Additional details regarding

Box 1. Implementation components of the Framework for Management of Concussion in Secondary Schools (FRANCS)

1. Defining a designated school concussion officer (or coordinator)
2. A direct concussion reporting line to report a suspected concussion of a student and to facilitate communication within the schools and with coaches, parents and external healthcare providers. That could include a designated email address (eg concussion@schoolname.schools.nz) linked to the concussion officer's email address
3. An automated email response from the reporting email address, providing immediate concussion advice.
4. Defined responsibilities for identifying and reporting a concussion to and within the school.
5. Monitor appropriate immediate referral for medical care and access to on-going health care. While school staff are not responsible for making healthcare appointments, they should encourage the student and their parents/whānau to do so. The exception is for students of boarding houses, in which case the house parents organise such appointments and follow-up.
6. Define a communication plan for all relevant stakeholders.
7. Defining and monitor students' academic adjustments and return to learn and physical activity/sports until medical clearance has been confirmed.

Table 1. Participant and organisation description.

Sector	Number of participants			Organisational level ^A		
	All	Males	Females	National	Regional	Local
Health and wellness	28	9	19	11	1	10
Sport	14	11	3	4	3	
Education	3	1	2	2		
Total	45	21	24	17	4	10

^ALocal representatives included medical doctors, physiotherapists (including physiotherapy specialists), and an occupational therapist providing concussion services.

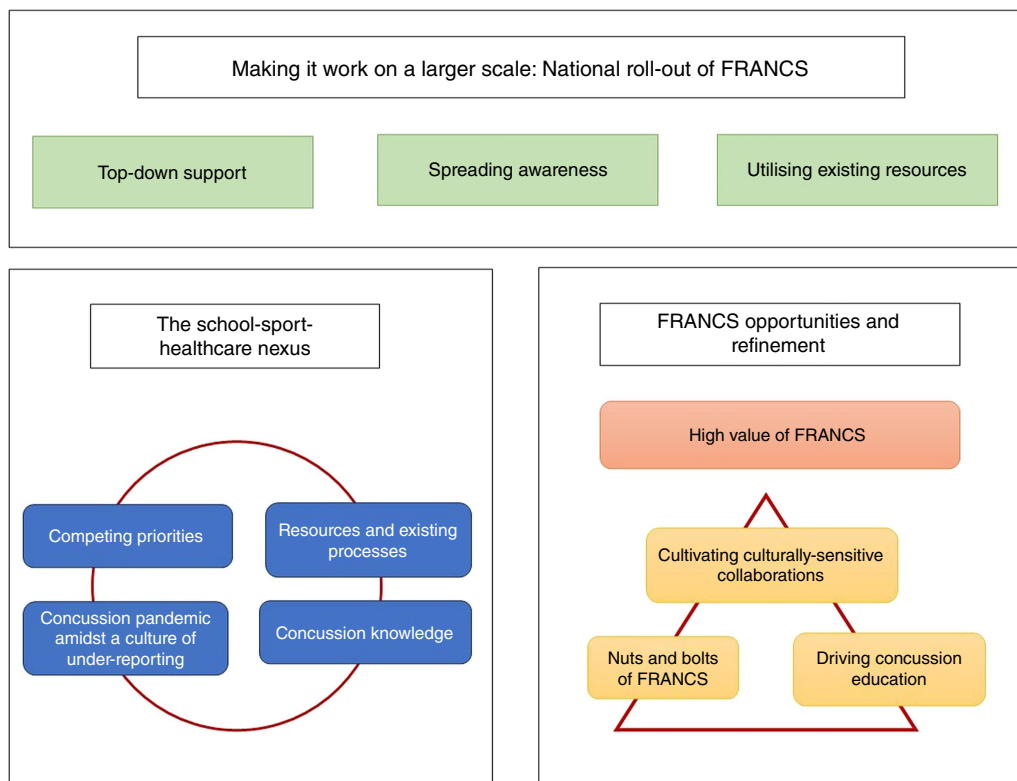


Fig. 1. Three main themes describe the current challenges of concussion in schools as perceived by the participants, opportunities for FRANCS with recommendations for improvement, and recommendations for larger scale roll-out.

rigour, trustworthiness, and reflexivity are contained in the Supplementary File S1.

Results

We developed three main themes: the school–sport–healthcare nexus; FRANCS opportunities and refinement; and making it work on a larger scale (Fig. 1).

Theme 1. The school–sport–healthcare nexus

This theme and four sub-themes capture participants’ perceptions of the implementation setting and considers how

school, sport, and healthcare contexts intersect and potentially influence future wider implementation of FRANCS.

Competing priorities

Participants felt priorities varied between sectors, influenced by organisational purpose, resourcing, knowledge, and desired student outcome. Healthcare providers (HCPs) suggested sports coaches and organisations often focussed on students’ medical clearance for return-to-sports, not always appreciating the impact of premature return on the student’s wellbeing, learning, and long-term recovery. Different priorities and implementation requirements were reported across different sports, complicating concussion management. Sports

organisation participants appeared wary of player and parents' frustrations about missing sporting opportunities due to stand-down periods, especially if they 'only had a mild concussion'.

I think the different opinions that can come in and the different pressures that students can feel, both in the sporting contexts and in the school contexts. How can they play rugby when they can't come to school and concentrate for a period ... (Interview 11 – Education sector)

Resources and existing processes

Schools were often resistant to change due to limited financial and human resourcing and ever-increasing responsibilities. Finding additional resourcing for yet 'another' new process could be challenging and act as a barrier to implementation.

I suppose I'm cautious about it, because, anecdotally we hear infinitum how stressed the schools are and how much pressure they're under ... (Focus group 10 – Sport sector)

Participants reported lack of practical guidelines for concussion management for schools, with HCPs often liaising between schools, sports teams, and parents. Varied sports-specific concussion guidelines confused implementation.

In terms of the overall concussion guidelines, there hasn't been as much implementation across sport, and that kind of goes back to my earlier points around us needing to get a more consistent and agreed approach, and then I think it's easier for all sports organisations to pick it up. (Interview 2 – Health sector)

Concussion knowledge

Participants reported varied concussion knowledge in school, sport, and healthcare sectors

Often there's not a lot of uptake from schools, because I think it's not that there's necessarily a resistance to help or anything. I don't think that's the issue. I think it's a bit of a scary bogey condition that teachers feel a little bit not able to really understand or support well. (Interview 3 – Health sector)

They considered concussion knowledge to be context-dependant and role-specific: coaches needed to recognise a potential concussion during sport, whereas teachers needed insights for individualised return-to-learn processes. Participants suggested that enhanced knowledge could facilitate buy-in and collaboration between stakeholders.

Concussion beliefs – 'a pandemic' amidst a culture of under-reporting

Participants identified increasing public awareness about potential long-term concussion consequences. They believed that current media attention could be leveraged to raise awareness about concussion in schools.

Participants reported witnessing persistent uncertainty in identifying concussions. Inconsistent player removal from sport by coaches despite of injury added to the discourse of fear and uncertainty. Under-reporting potential concussions was reinforced by some coaches wanting their players to remain available for selection, parents who wanted their children to excel in sports, and players not wanting to let their team down. Some participants noted that under-reporting was amplified by the Kiwi attitude of 'she'll be right' and not wanting to 'make a fuss'.

We know that quite a lot of them under-report because they are keen to get back playing with their friends in the playground, or they've got an exam to study for, or they've got a sports match to play. (Focus group 2 – Sport sector)

Theme 2. FRANCS' opportunities and refinement

This theme and sub-themes centred on participants' perceptions of factors specific to the framework that may influence its implementation

Seeing value in FRANCS to facilitate buy-in

Participants considered the framework to be clear and understandable, acknowledging the limited time and resourcing of teachers. The structured processes could facilitate identifying a potential concussion, removal of such student from the sports field, and encourage accessing health care.

Personally, I saw a lot of value in it. Because there's no system currently. And I think everyone's crying out for something around concussion and how it's managed. And it looks without trying to downplay the work you've done, it looks really relatively simple, which is fantastic. So the process looks easy for somebody to be able to pick it up, and then pass it on to the next person to make sure all of those things are happening in the background. (Focus group 3 – Sport sector)

FRANCS might create shared accountability and responsibility across stakeholders for students' wellbeing and return-to-learn and return-to-sports processes. The resources embedded in FRANCS were considered useful concussion management guides, enhancing confidence and potentially decreasing uncertainty and fear about the process.

A perceived barrier to current processes was parents' burden to drive the post-concussion process, often lacking knowledge to do this confidently. A streamlined reporting

and referral system within the school and with HCPs may provide a more holistic, supported recovery experience for the student and their whānau (extended family). Participants appreciated that FRANCS had been developed locally, piloted, and adapted for the NZ school system.

Clear communication lines

Lack of consistent immediate management and communication between different stakeholders (school, sport club, and home) was considered a barrier. Participants suggested that a central school-based communication point would minimise risk of students 'falling through the cracks', including those that incurred a concussion external to the school.

We've had a few cases where it would have been really helpful to have that pressure taken off the parents and have a designated person who was able to facilitate those things. And particularly if a student is enrolled in a multi-disciplinary concussion service, often there'll be clinicians involved that need to liaise with the school, and we found that can be quite challenging, our occupational therapists don't know who to get hold of [in the schools], or things just sort of disappear into the void. So I really liked the idea of having a touch point in each school, and then it's really consistent, regardless of what school that kid goes to. (Focus group 1 – Health sector)

Continuous cultural collaborations

The relationships between schools, sports coaches, HCPs, and parents were considered pivotal for the framework's success. Further collaborations were recommended to adapt FRANCS to individual schools' resources, diversity, and culture. Greater understanding of how concussion impacted Māori and Pasifika communities and how these communities accessed and engaged with health care is required.

Like with all kinds of co-designs, especially if we're looking towards Māori and Pasifika, is going and saying, what do you need? Because I think we're pretty good at being like, here we go. This is the right way to do it. ... We've translated it for you ... And it may be about, you know, you have to sit down and talk about concussion as a community. (Focus group 8 – Health sector)

Driving concussion education and including knowledgeable stakeholders

FRANCS' educational resources were considered useful to improve concussion awareness among the community, which could enhance confidence to report suspected concussions, support students' recovery, and seek timely help from HCPs.

It is good awareness for the students themselves, because maybe the students themselves realise that they're not

quite right, and they need help. Often the teachers and the parents may not actually realise that, especially with students going through particularly adolescence ... and remember symptoms on things like ... is it an adolescent growing happening, or is this something different in my body? And it's giving the students the knowledge to say, hey, there is actually something else going on. And I think the more education we can get at those crucial points. Like the students are a different stakeholder group, they may take responsibility themselves. (Focus group 9 – Health sector)

Quality concussion-related education and resources would need to be adaptable for different contexts and roles for schools, HCPs, parents, sporting organisations, or other community members. Uncertainty was raised around who should be responsible for delivering and resourcing concussion education and where to find relevant resources.

Participants believed that not all HCPs had the knowledge required for concussion diagnosis, rehabilitation, and symptom management, posing a risk for students being prematurely cleared for return to activities.

That's a knowledge gap within [medical] general practice, which really does worry me, because I think they green-light people who aren't ready for a lot of things, where they still need that measure of support. They still need to be kept out of sport, limited hours, whatever it may be, that symptom management requires the GP to put some boundaries around those things, and they don't. And so it is a worry. (Interview 6 – Health sector)

Multi-disciplinary concussion clinics were limited to specific sports or geographical regions. Concussion services funded by Accident Compensation Corporation (ACC, NZ's national no-fault accident scheme) for those with persistent symptoms needed expansion across the country.

Fine-tuning the nuts and bolts

Participants identified gaps and suggested specific modifications to FRANCS. A consistently voiced concern was around the role and required skillset of the 'concussion manager', the central communication point suggested in FRANCS for receiving concussion reports at the schools, 'navigating' the student rather than making healthcare decisions. The concussion manager (or officer) might be an administrator or teacher instead of a school nurse or other HCP. Participants thus suggested that the role would have to be carefully defined to remain within the scope of the staff member.

GPs were the only HCPs who could diagnose concussion in NZ. Participants considered restricted diagnosis and clearance to be barriers, given GP accessibility (either no availability or time/financial constraints) in various regions. Participants noted that students with sports-related concussions were often assessed by a physiotherapist or occupational therapist prior to accessing GPs. Alternatively, some

students could not access a GP and were managed by the physiotherapist only.

The reality is, [the physiotherapists] are not making the diagnosis but they are actively involved in management and if we look at some of the research in sport, physiotherapists and concussion ... physios are already doing this. So why don't we record what's actually happening in the field? ... Accessing the GP's is difficult, whereas our physiotherapy colleagues and occupational therapist colleagues are doing this, they're telling people, we don't think there's a major issue here based on what I see, then you can turn to narrow the scope. That's what's happening in the community as we speak. (Focus group 6 – Health sector)

Participants indicated the framework was unclear about monitoring the student's recovery: how and by whom symptoms would be assessed, and who was responsible for managing rest, recovery, and follow-up with the student within the school. Clarity was also needed for reporting concussion processes that occurred external to the schools.

Theme 3. Making it work on a larger scale

This theme and sub-themes describe the participants' expectations that coordinated efforts and collaborations among several agencies and stakeholders are needed for nationwide implementation.

Top-down support

Collaboration between local, regional, and national stakeholders was needed to raise awareness of FRANCS, support schools to tailor FRANCS to their contexts, and develop long-term policies for concussion support for all schools. Participants suggested that wider implementation of FRANCS would need collaborations between ACC, the Ministry of Education, and the Ministry of Health.

I have had several meetings, trying to get broad injury prevention strategies into schools, and the observation is that it's really important to get the interdepartmental agreement in order to actually make them work. ACC was very engaged. But [the Ministry of] Health ... were totally unengaged. ... I don't believe this will ever be successful at a national level, unless you can get the Ministry of Education to be involved. (Interview 7 – Health sector)

Suitably trained HCPs, concussion clinics, ACC concussion services, and local concussion researchers could support implementation.

External funding support

Most participants felt external support may be required for concussion education and resourcing. Schools may face human and financial resource limitations. Suggested support

included having people available to guide initial implementation and part-funding the concussion officer's position. Support might be needed from ACC and the Ministry of Education.

Spreading awareness

Lack of awareness of concussion management was a common barrier. Participants from all sectors recounted stories of individuals who had not appreciated the seriousness of concussion. The busy lives and copious amount of new information offered daily via media and the schools could not always be absorbed. Real-life stories of concussion experiences by students and their whānau should be included in resources, as well as stories of successful implementation of FRANCS in schools. Face-to-face conversations and interactions were important, preferably within the respective school communities and their HCPs. A multi-modal approach to disseminating information was recommended, via social media, radio, television, roadshows, research journals, conferences, and a centralised website.

There are quite different demographics you need to target. So looking at what are the other ways that we can be targeting? Things like social media, bite size TikToks, around you know, things like that, that kind of thing. You may be saying that same message different ways. (Focus group 8 – Health sector)

Utilising existing resources

Participants suggested that schools could use existing administration resources to minimise the workload impact of FRANCS. School administrators who understood their internal systems could set up school-specific concussion reporting systems. Concussion reporting should also be included as part of existing injury/incident reporting requirements. Participants recommended using existing forms of information dissemination, such as professional development providers and embedding information in coaching handbooks and school newsletters.

Discussion

Key findings in our study suggested lack of existing concussion management guidelines and resources in NZ schools and challenges of implementing interventions in complex school systems. Lack of implementation of available return-to-learn guidelines remained, as reported elsewhere.^{9,10,19,20} Similarly, concussion knowledge of coaches, teachers, and parents was a barrier to optimal management.^{10,21,22} Participants acknowledged the importance of collaboration and communication among stakeholders for the optimal functioning of FRANCS. They also highlighted the need for specific roles and responsibilities within schools, additional educational resources, and timely access to concussion-trained

GPs. Delayed GP access in NZ affected all aspects of primary care.^{23,24} Greater inclusion of skilled physiotherapists was suggested to mitigate post-concussion access challenges as well as facilitate holistic care of the student.^{25–27}

Implementing interventions in complex school systems with many stakeholders is challenging,^{14,28} compounded by constrained resources and resistance to change.^{9–11} In the context of concussion management, schools interact with sports teams, clubs, coaches (often volunteers), and external HCPs. Despite growing awareness of potential long-term consequences of concussion,^{29,30} participants reported a persistent culture of under-reporting in sports, a barrier to optimal use of FRANCS. FRANCS may work to broaden understanding between different contexts such as sport and healthcare, by creating better connections between these stakeholders, who all have different roles in concussion management. By strengthening these relationships and aligning priorities, holistic and structured care to students may be improved.^{31,32}

Implication for policy and practice

The participants of this study, from national, regional, and local organisations related to sports, education, and health care, overall supported the value of FRANCS for the NZ school context. Due to the complex school systems, FRANCS needs to be tailored to individual schools,³³ and its flexibility allows schools to meet the specific needs of their diverse student populations and respond to evolving educational landscapes. FRANCS was developed collaboratively with teachers, school administrators, parents, students, sporting organisations, and HCPs to facilitate the best possible fit of the framework for NZ schools.⁸ By being adaptable to schools' specific available resources, FRANCS has the potential to address some resource challenges envisaged as part of its implementation.

NZ schools are self-managing, developing, and implementing their own guidelines and protocols, fostering autonomy.³⁴ Concern evolved regarding the pressure schools were experiencing when too many policies were required.³⁵ Involving school leaders in the rationale and theories of action behind proposed policies and guidelines is expected to enhance the likelihood of effective implementation.³³ Most participants indicated that external 'top-down' support would be required to successfully operate FRANCS, similar to sports' governing levels driving injury risk management strategies at community level.³⁶ We believe it important to advocate for additional support to align concussion management across schools and to ensure all students have equitable access to care. Timely post-concussion support should be a priority for schools, sporting organisations, and HCPs, as such support will benefit students' academic performance, their overall well-being, and long-term healthcare costs.^{2–4}

In accordance with the Ministry of Education obligations towards Te Tiriti o Waitangi (Treaty of Waitangi),³⁷ further collaborative engagement with Māori (and Pasifika) is required to ensure cultural ownership, responsiveness, buy-in, and

support for FRANCS, and for achieving equitable outcomes for Māori and Pasifika students with concussion.

A limitation of this study was involving only three education stakeholders. However, school stakeholders (teachers, principals, and administrative staff) were included and played a key role in the design of the framework.^{8,13} Future work should build on this study and focus on the engagement of high-level educational stakeholders.

Conclusion

Participants perceived high value of the FRANCS to address challenges for concussion support in schools. Specific recommendations were made to enhance the framework's value, utility, and implementation.

Supplementary material

Supplementary material is available [online](#).

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Data availability. The data sets generated and/or analysed during the current study are not publicly available as ethics approval was given on condition that only members of the research team would have access to these data.

Conflicts of interest. The authors declare that they have no conflicts of interest.

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