

Processes for identifying and managing traumatic brain injury in the justice sector

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ABSTRACT

Background. Individuals engaged with the justice sector have complex health needs, which often intersect with traumatic brain injury (TBI). Prior research suggests that the prevalence of TBI is high among offenders. However, it is unclear what processes are in place to support their TBI-related health needs. This study aimed to establish how TBIs are currently identified and managed across the justice sector and to identify opportunities improve access to healthcare services for individuals following TBI. **Methods.** This study was conducted through semi-structured interviews with justice sector staff, underpinned by the interpretive description approach. Participants were asked about how TBIs were managed in their setting and what would improve how they supported people in their care. **Results.** Nine interviews were conducted with clinical managers ($n = 2$), probation officers ($n = 2$), psychologists ($n = 2$), a mental health nurse ($n = 1$) and program coordinators ($n = 2$). Analysis identified one overarching theme, 'The need for national standards to facilitate practice change', which incorporated five sub-themes: (1) Need to know about current and historical TBIs, (2) Need to address factors affecting reporting of new injuries, (3) Need for clear healthcare pathways, (4) Need for communication across the justice and healthcare sectors, and (5) Need to upskill people across the justice sector. **Conclusion.** Routine screening processes, clarifying professional roles, streamlining healthcare pathways, facilitating data sharing and upskilling workforce knowledge about managing people affected by TBI may help to improve identification and management of TBI across the justice sector.

Keywords: concussion, interviews, justice sector, prison, processes, qualitative, TBI, traumatic brain injury.

Introduction

The prevalence of traumatic brain injury (TBI) has been found to be high among people within the justice sector. A meta-analysis of 20 studies estimated that the prevalence of TBI in offenders was 60% (95% CI 48–72%; [Shiroma et al. 2010](#)). These prevalence rates are much higher than the 13% observed in the general population ([Te Ao et al. 2015](#)). The relationship between TBI and criminality appears to be complex, with many precursors and effects co-occurring to make establishing causality difficult ([Williams et al. 2015](#)). For example, having a TBI can increase the risk of engagement in criminal behaviour through increased impulsivity, poor emotional regulation and executive functioning difficulties ([Hesdorffer et al. 2009](#); [Williams et al. 2018](#)). TBI has also been associated with earlier age of incarceration, increased risk of violence and a higher number of convictions than those with no history of TBI ([Williams et al. 2018](#)). At the same time, those who engage in criminal behaviour are at increased risk of TBI from high risk behaviour such as assaults, road accidents and drug and alcohol use ([Perron and Howard 2008](#); [Williams et al. 2010](#)). There are further complexities when exploring TBI within the justice sector. For example, there is a higher proportion of indigenous people

within the justice sector, who, in addition, have been found to have an increased risk of TBI (Lakhani *et al.* 2017). Further inequalities are evident between males and females, with increased prevalence of TBI history among females (Shiroma *et al.* 2010; O'Rourke *et al.* 2018). Further, offenders are often not aware of their injuries, with one study finding that only 29% of individuals reported their TBI to healthcare professionals (Shiroma *et al.* 2010).

In the general population and sporting contexts, experiencing multiple TBIs has been shown to have cumulative effects on behaviour and functioning (Manley *et al.* 2017). There is also evidence to suggest an increased risk of re-injury after sustaining a TBI (Dams-O'Connor *et al.* 2013). Within the justice sector there is evidence that a third of people in prison have experienced repeated TBIs and may be at risk of cumulative effects (Mitchell *et al.* 2017). However, data on timeframes between injuries and identification of periods where repeated TBIs were sustained in quick succession is limited. Consequently, the impact of repeated TBIs within people in the justice system and generalisability of the findings from other contexts remains unclear.

Literature on the incidence of TBI within the justice sector is lacking; however, injuries can occur in this context due to involvement in fights as well as from accidentally hitting the head on an object or through playing sport. Acute TBIs need to be appropriately managed within the justice sector because the impacts of TBI can be persistent even following a mild TBI (mTBI) (Nelson *et al.* 2019). People can experience a range of physical, cognitive and emotional symptoms, including chronic headaches, noise sensitivity, increased irritability, dizziness or visual disturbance, cognitive difficulties and fatigue. Prisoners with TBI may struggle with learning or remembering things and be more sensitive to bright lights, loud noises and fatigue. These symptoms may make it harder to comply with requirements within the prison (Budd 2020) and may lead to frustration, aggressive, unpredictable behaviours, higher rates of rule infractions and increased risk of re-offending once released (e.g. Shiroma *et al.* 2010; Williams *et al.* 2010; Piccolino and Solberg 2014; Horn and Lutz 2016). Early identification and appropriate management of prisoners with TBI is therefore essential to improve outcomes (Moppett 2007).

People in the justice sector (including those who have been sentenced) are entitled to the same level of health care as would be provided to individuals in the community (Gatherer 2007). In New Zealand, the costs of health care following TBI are covered by a publicly funded, no-fault Accident Compensation Corporation. However, despite this, Williams and colleagues (2018) suggest some facilities are not well placed to address the needs of people impacted by TBI in prison. One study of women in prison found that just under half of respondents described the quality of healthcare services provided to be poor and not adequate in meeting their needs (Geitona and Milioni 2016). A range of barriers to accessing health care while in prison have

been identified, including long wait times, staff decision-making around if the request to see a healthcare provider was appropriate, and constrained resources (Hatton *et al.* 2006; Powell *et al.* 2010; Pont *et al.* 2012). These healthcare access challenges may be exacerbated within indigenous populations which also experience health, social and economic marginalisation due to the impacts of colonisation (Cunneen and Tauri 2019). Lack of trust between prisoners and medical services and practitioners can also result in prisoners sometimes opting to postpone their medical requirements until after they are released (Heidari *et al.* 2017). Other factors that influence access to health services include complex referral processes to outside specialist services, resulting appointment cancellations due to lack of prison officers to escort a prisoner (Powell *et al.* 2010). People involved in justice settings in the community, such as those on parole, also experience barriers in accessing health care. One study of men on parole in the USA identified that the main barriers to healthcare access were financial (including being uninsured and being poor), administrative (including bureaucratic and procedural obstacles, excessive wait times and administrative failures such as lost medical records) and professional demeanour (including feeling like clinicians lacked empathy and care in their approach; Marlow *et al.* 2010).

One of the initial challenges in the provision of effective health care for TBI is identification of need. Misconceptions about TBI can lead to barriers of identification and treatment of TBI (O'Rourke *et al.* 2018). For example, some people believe that you need to have lost consciousness to have experienced a TBI or experienced a direct hit to the head (O'Rourke *et al.* 2018). Additionally, as TBIs are invisible injuries and symptoms can emerge several hours or days after injury, many people often do not realise that they experienced an injury and need to seek help, or are unaware of the injury's effects (O'Rourke *et al.* 2018). A further challenge in TBI identification and management is health practitioners' confidence with identifying and managing these injuries, especially when presented alongside other healthcare concerns (Kushner 2015; Budisin *et al.* 2016). Indeed, health services offered to people in the justice sector tend to be generic rather than explicitly tailored for people with TBI (Chan *et al.* 2023). Further compounding the impact of TBI is that people who engage in criminal activities are less likely to seek appropriate treatment (Horn and Lutz 2016).

Evidence from a recent systematic review has found that multidisciplinary rehabilitation services significantly improve recovery and reduce symptom impact (Möller *et al.* 2021). However, for this to occur, initial recognition of the TBI and determination of the need for a referral is necessary (Wieggers *et al.* 2021). There is currently a lack of research examining current practices within the justice sector and identifying areas to improve the identification and management of TBIs. Consequently, the aim of this research

is to explore how TBI is managed in the justice sector and opportunities to improve access to healthcare services for individuals following TBI.

Methods

Design

Justice sector staff were invited to participate in interviews between 1 March 2022 and 22 June 2022 in Aotearoa/New Zealand. Nine staff expressed an interest in taking part in the study and nine completed the interview. An interpretive descriptive (Thorne et al. 1997; Thorne 2008) approach was adopted. A key strength of this approach is the generation of practical recommendations that, in the context of this study, could inform initiatives to support TBI care reform within the justice sector.

Approval to undertake this study was obtained through the Auckland University of Technology Ethics Committee on 23 February 2022 (AUTEC Reference number 21/431) and Department of Corrections Research and Evaluation Steering Committee (RESC; approved 20 May 2021).

Recruitment

Justice sector staff with an interest in TBI were invited to participate in the study using a study recruitment flyer and email that were disseminated through the Department of Corrections. All staff who expressed interest in participating had the opportunity to talk about the study and were screened for eligibility. To be eligible to take part participants needed to: (i) be currently working within the justice sector and (ii) work in a position where they provided clinical care or oversight to people within the service. If eligible, a study information sheet was emailed to provide more detailed information about what would be involved. Following agreement to take part, a time was arranged to conduct the interview either in person or via Zoom, based on participant preference. Written informed consent was obtained prior to conducting the interview.

Data collection

A semi-structured interview approach (Robson 2002; Hofisi et al. 2014) with probing questions was used to explore perceptions and experiences about how TBI was managed and what could be improved (Table 1). Interviews were conducted by one researcher (L.W.) and were audio recorded and transcribed verbatim.

Data analysis

Transcripts were anonymised and uploaded into NVivo software (ver.12) for analysis. First, two analysts (L.W. and J.C.) independently open coded the transcripts inductively using

Table 1. Interview schedule.

Preamble: For the purpose of this interview, brain injury is defined as an injury to the brain as a result of an external physical force. We will be discussing mild brain injuries, also referred to as concussions.	
1. What currently happens if there is a suspected brain injury within your service?	
o How might you respond to a suspected brain injury within your role?	
o Is there a specific process that is currently used in your service to identify injuries, e.g. a specific set of questions or tests that is used?	
o What happens after an injury has been identified?	
o What types of healthcare services are available to people within your care after a brain injury has been diagnosed?	
o How easy is it to access health care/rehabilitation for people who have had a brain injury in the justice sector?	
o Are processes any different if there is history of an unrecovered old injury and more recent injury?	
2. How have you found the current process so far?	
3. What has been helpful about the process?	
4. What challenges have you experienced?	
5. What improvements could be made to how brain injuries are identified and managed within your service?	
6. What would be helpful to support reduction of health inequalities (e.g. age or culture) within your service?	
7. Are there any resources/training that you would find helpful?	

a semantic and latent level interpretation of the text. Second, codes were clustered into higher-order sub-themes and themes representing concepts (Coffey and Atkinson 1996; Patton 2002). These were then organised into a conceptual framework representing TBI care in the justice sector and factors influencing change. Third, the two independently derived frameworks were compared and contrasted for areas of overlap and non-overlap. A meeting between the analysts (L.W. and J.C.) and A. T. as arbiter was conducted to develop an overarching composite framework. This process was dynamic, with sub-themes and themes being explored, altered and removed as needed (Thorne et al. 1997). Fourth, remaining interview transcripts were coded by L.W. into the composite framework, which was further refined in discussion with the research team (A.T. and J.C.) if there were any changes needed.

Results

A total of nine participants, mean age 51.1 (±11.4) years participated in interviews lasting 30 to 85 min duration. The participants represented clinical and non-clinical staff, and staff working across different settings within the justice sector (e.g. community-based probation officers and psychologists versus prison-based clinical managers). On average, participants had 8.1 (±7.0) years' experience working

Table 2. Demographic characteristics of the study participants (N = 9).

Characteristic	N (%)
Gender	
Male	3 (33.3)
Female	6 (66.7)
Ethnicity	
European	5 (55.6)
Māori ^A	2 (22.2)
Other	2 (2.2)
Occupation	
Clinical manager	2 (22.2)
Probation officer	2 (22.2)
Psychologist	2 (22.2)
Mental health clinician (nurse)	1 (11.1)
Non-clinical program manager/coordinator	2 (22.2)
Education	
Lower secondary school	1 (11.1)
Upper secondary school	2 (22.2)
Bachelors	1 (11.1)
Postgraduate qualification	5 (55.6)

^AMāori people are the indigenous population of NZ.

in their current role, and 13.6 (± 8.2) years' experience working in the justice sector. Gender, ethnicity, occupation and education characteristics of the sample are reported in Table 2.

Overall, the participants expressed diverse views and insights, despite concern from some that they did not have much to contribute. While the study initially aimed to focus on how acute TBI was managed within the justice sector, participants often referred to processes for historical injuries in addition to acute injuries. As this study used a data-driven approach, analysis included participants' perspectives on both acute and historical TBIs. The analysis produced one overarching theme, 'The need for national standards', supported by five sub-themes (Fig. 1): (1) Need to know about current and historical TBIs; (2) Need to address factors affecting reporting of new injuries; (3) Need for clear healthcare pathways; (4) Need for communication across the justice and healthcare sectors, and (5) Need to upskill people across the justice sector.

Theme 1. Need to know about current and historical TBIs

Participants, in both clinical and non-clinical roles, saw value in being aware of an individual's TBI as it influenced how they would work with an individual.

Overarching theme: the need for national standards	Theme 1. Need to know about current and historical TBIs
	Theme 2. Need to address factors affecting reporting of new injuries
	Theme 3. Need for clear healthcare pathways
	Theme 4. Need for communication across the justice and healthcare sector
	Theme 5. Need to upskill people across the justice sector

Fig. 1. Summary of the themes identified from participant interviews.

You might think somebody's been non-compliant. But they're not, their brain's fried, or scrambled, and not through drug use, or anything like that, but they're suffering from a brain injury that you haven't identified or are not aware of before. They can't keep their appointments, you know, they constantly forgetting things they forget to ring you and tell you, they can't come in and report, so it can have a really negative effect on their compliance level. If you don't understand what you're dealing with, you know, like, if you knew they had a brain injury, you'd be more tolerant, you'd try and find ways to do things differently suggest things, you know maybe a notebook or I'll text you or, you know, a lot of other things to help them and to support them to get to where they need to be, versus you're just being ignorant, noncompliant. (P5)

When asked about how TBIs were identified, participants focused more on identification of historical TBIs as they felt this was important to inform how they worked with a person. Participants suggested that there were multiple opportunities to ask about historical injuries early in the individual's journey in the justice sector. If a consistent process were to be implemented, this would allow for the system to put the support, resources and expertise in place as soon as possible to support the individual. Clinical staff found historical TBI history information useful when assessing new injuries.

What would be extremely helpful is that when people come into contact with the justice sector, at the first point of contact, that there is an assessment of their level of function including fetal alcohol, brain injury, mental health, addiction, in that cohort of conditions could then determine a treatment pathway for the individual rather than a criminal pathway. (P2)

When asked about if there was a specific process that was followed after identification of a TBI, such as specific questions or tests, no consistent process was described by any of the participants. In reaction to historical injuries, one

psychologist reported utilising questions from the Ohio State University TBI Identification method, however noted that they were more interested in the impact of the injuries on the person's life and ability to function currently than in the specific details of the injuries sustained as elicited by the tool.

...just the basic head injury question. Have you ever had a head injury or loss of consciousness? Those questions that really were around the same types of questions and the Ohio State TBI screen, we just brush over those just to get the idea of any head injuries. (P4)

Participants referred to processes that were working well for other health conditions that could be used to inform a process for brain injury.

So if you think of somebody with an addiction pathway, there were assessment tools to use when they're acutely unwell. This assessment tools to determine the level of withdrawal. There are assessment tools to determine the level of addiction and pathways of support. And then there's residential and funded treatment and health professionals with specific roles supporting their treatment for their addiction. And it doesn't seem to be that level of pathway for a person with brain injury. (P2)

Theme 2. Need to address factors affecting reporting of new injuries

Inter-staff communication was noted by participants to be important in identifying TBIs. Specifically, nurses relied on custodial staff to notice if a possible injury had occurred and communicate their concerns as nurses were often not in close proximity to the prisoners, unless seeing them for medication rounds or for scheduled check-ups.

Custodial staff are extremely good at notifying Health if they have any concerns about the wellbeing of the people that they're looking after. And they are that first point of contact as far as response. (P2)

However, concerns were raised by participants about what happened if an incident had not been witnessed by staff or there were no obvious signs of injury such as bruising.

...these guys can get hit in the head and not let us know. It would have to be upon them to report it to us for us to actually take any action... (P6)

In these situations, participants mentioned that people in their care may not feel comfortable approaching staff and that fear of potential repercussions may prevent people coming forward.

Some people may, may be very scared. And they may openly say they're scared and they need to be moved to a different unit, maybe where there's more supervision... but other people may not speak up. (P7)

Another participant added that asking for help could be perceived as a sign of vulnerability, also acting as a barrier to identifying injuries.

It's not an environment where people are encouraged to show signs of weakness, or vulnerability. So that isn't always necessarily shared with the health team or the custodial team if there is a problem... (P2)

Some participants felt that some areas of how quality was measured in service delivery could be better aligned with other cultural worldviews. For example, two participants felt that evaluation criteria (assessments, outcomes, view of 'success') were not sensitive to different perspectives of 'success'.

I think a bigger question is, does our westernised health model fit everybody's health needs? (P1)

Theme 3. Need for clear healthcare pathways

All participants described that following recognition of a new suspected TBI, individuals were referred to a clinician (such as a nurse or general practitioner; GP) for initial assessment, diagnosis and were taken to the emergency department if needed. In prison, the person would be taken to the healthcare team; in the community, the person would be encouraged to make an appointment with their GP. However, the process for historical injuries of concern was much more varied. Several participants described referring the person to the mental health team or psychology team for review.

...if we felt something was a little bit off, we'd get the mental health clinicians involved because obviously...we have no ability to fully assess somebody or you know, suss out is this a brain injury or is this mental health? (P3)

However, the mental health practitioner in the study noted that they did not receive specific referrals for suspected TBI and did not feel confident to assess an individual with TBI. Consequently, onward referrals to other providers such as GPs or neuropsychologists were practiced.

...a referral will never be made specifically for brain injury... But then there's some head injuries in there [referrals they do receive] ... we will refer on, either to the GP or, or to the forensic team, which has a psychiatrist and sometimes the psychologist that that could, could possibly help. (P7)

Participants felt that communication between nurses and custodial staff was strong. However, other participants expressed uncertainty around what their or others roles were and what to do if they became aware of a suspected TBI that could be impacting a person in their care.

The custody staff might have a protocol where if somebody did get, like, hit in the head they would have to go, but I'm not really sure. (P6)

Participants reported that accessing healthcare providers and services for TBI, irrespective of their role, culture and location, was difficult. Participants stated that it was difficult to identify TBI rehabilitation service providers in their area and would like clearer guidance on how to get people access to the care that they needed. Participants advocated that health pathways were critical to providing appropriate health care yet TBI-relevant pathways were often unavailable or difficult to access.

People should also be able to access services without having to go through a convoluted referral process... we don't have access to a neuro psychologist or a formalised pathway for access to concussion clinics or brain injury NZ, to provide any additional support... Some sites access Brain Injury NZ on release and discharge for people when they're going into their home but not always within the prison environment. (P2)

Some participants also noted individuals can, and do, decline assessments following an injury. Some staff members had strategies for if individuals declined assessments such as conducting passive observations of the individual to ensure their condition was not worsening. However, it was not clear if this was consistently practiced as a formalised process.

Quite often, some of the people in our care are reluctant to be assessed and decline to be assessed... so we record how they are engaging, what they look like, what their gait and movement is like, and also speech. So that there is still a form of assessment occurring to determine how, or what plan we might need to put in place for that person. (P2)

Theme 4. Need for communication across the justice and healthcare sectors

Some participants found it challenging that an individual's health and corrections data were often not linked between services or shared. This was a barrier to participants' ability to review information about an individual's TBI history, even if the information had been recorded at an earlier timepoint. Participants working with individuals in the community also reported that obtaining a health history of an individual in the justice sector was challenging because their

health history often did not follow them into community services.

But it's nine times out of ten when these guys come into this program we're the ambulance at the bottom of the cliff, and we're the ones that have to start climbing back up onto the cliff, to keep these guys to where we need them to get, whereas if we knew about it, we could have the process put in place before they come to the program. (P9)

Participants also noted difficulty sharing an individual's health history both within prison departments and between the justice sector and community services. For example, some participants found it difficult to know if an individual had an active injury claim, or what the outcome of the claim was.

I'm aware that if a person on the community presented to the GP with an injury they get a letter back from ACC [Accident Compensation Corporation], saying that your claim has been accepted or declined. But for some reason, we don't seem to have that process occurring. (P2)

Participants found it useful when they were aware of what services or supports an individual had accessed previously, including before they entered the justice system. Participants felt that they would make an effort to re-engage with these services if they were aware of them.

...they've had previous, previous supports in the future from, you know, a Brain Injury Association, or a social worker or something like that, you know, that we can sort of re-tap into. (P5)

Participants also relied on communication from external agencies to support health and/or justice sector staff to take care of, or understand, a person's health history.

But a lot of the time, they've already got social workers assigned to them that are working with them, so the social worker will most often just reach out to us and say, Hey, I'm working with such and such, I understand they're being released to you. Or we find out through the people in our care, they're getting medication, or their social worker's, picking them up and bringing them into appointments or, you know, that sort of thing. So that's sort of how we access it. (P5)

Theme 5. Need to upskill people across the justice sector

Participants noted that there was a need to be proactive in asking about possible injuries due to low awareness of brain injury in the population.

They don't know what a head injury is. That's why, [you need to ask] were you in a fight lately? Oh, did you get hit in the head? ...you need to build a good rapport with them to be asking some of these questions. (P6)

However, in order to know how to ask about brain injury, there needed to be more workforce knowledge (for example, the prison health team, custodial and probation staff) around TBI. Participants wanted more information on key signs of an injury and the impact a history of TBI can have on current functioning and behaviour. Other suggested strategies to improve workforce knowledge around TBI, including training to identify a possible TBI, training to discern between TBI and other conditions (e.g. mental health), and training to support a person with TBI.

...now and then we have a psychologist will attend various sort of trainings on traumatic brain injury. People have done some study into the area and present the findings, but that's just part of your profession as opposed to the actual job itself, and I think it needs to be sort of like formal, you know, formal, formal training, I think formal understandings, of systems and process to deal with that. (P4)

Some participants had taken the need to provide better TBI care into their own hands. One participant noted their team was currently in discussions about care pathways for individuals in their care who may have TBI.

...we're currently discussing that, as a team, a pathway to, to support people, we suspect might have a brain injury. (P7)

However, one participant noted that implementing process change would be challenging due to clinical staff already operating at capacity and having to deal with other priorities such as their COVID-19 response. It was suggested that the appointment of an appropriate change champion or specialised staff would help facilitate process change.

If you can get a really good nurse to be the subject matter expert, to get those processes in place to make sure that there's no gaps in the process. And that then they can let, not do everything, but make sure that everything gets done by their colleagues and support their colleagues as they're learning the new process. (P1)

Overarching theme: the need for a national process

All participants acknowledged that there was a need to make improvements in how TBIs were identified and managed across the justice sector. Participants emphasised a

need for national-level guidance to support the implementation of standardised practices across different areas of the justice system.

There's a whole group of people at national office that you know, you know, if we, if we got the processes in place, so that the monitoring could be done. At national office, for example, you know, like, so they could run data to say, you know, how many people have got, you know, mild concussion or significant TBIs? And what have we put in place to help support them? (P1)

At the same time, participants also acknowledged that current TBI statistics were under-reported, which made it harder to advocate for change because there was no appropriate reference or baseline point. One participant noted that updating the current patient management system within a prison would require support from a national level due to the prohibitive cost of upgrading. Participants wanted better monitoring and surveillance using standardised outcome measures to monitor progress at an individual and service-level.

We get some good data out, you know, so we know we're on the right track or whether do we need to tweak you know, the questions we're asking or the processes we're putting in place. (P1)

A common discussion point was that the processes for managing individuals with TBI in the justice sector could be improved by standardising and formalising the processes for all staff. Participants felt this could be achieved by the development and maintenance of a clear, national process for TBI care.

...there hasn't been a focus on let's look at brain, traumatic brain injuries. We've never had of, there's no, specific focus in prison to look at that. And I do think that we, you know, we discussed it in our team, and we do think that there's a lot of work in this space to be done to identify these things. (P7)

Discussion

The purpose of this study was to explore how TBI is managed in the justice sector and opportunities to improve access to healthcare services for individuals following TBI. This study revealed that acute injuries in the custodial environment receive a medical assessment, facilitated by strong communication between custodial staff and clinical teams to identify and report injuries. However, for historical TBIs, there was need to consider how to support people to access further care (such as specialist rehabilitation services) if they needed them. There was a strong interest from

participants to learn more about TBI, the implications of TBI, and what could be done if there was a suspected acute TBI or historical TBI that may be influencing a person's current functioning. However, while participants found it helpful to know about an individual's TBI history (because it helped them tailor their approach clinically and non-clinically), obtaining an individual's TBI history was often challenging. A number of practical recommendations have been outlined in Table 3 to help people in the justice sector access timely and appropriate care following TBI.

Participants expressed a concern about the potential impact of historical TBI on current behaviour and risk of recidivism. Prisoners with TBI are more likely to have difficulties which reduce their ability to benefit from offender rehabilitation approaches that are usually used, meaning they have a greater risk of recidivism (Williams *et al.* 2010,

2015; Ramos *et al.* 2018). Recent or unrecovered TBIs have also been found to be consistent risk factors for longer-term consequences from TBI or prolonged recovery (McCrea *et al.* 2009; Greco *et al.* 2019). In the current study, participants described that if a TBI was noted in an individual's record, this helped them adapt how they worked with and supported people with their sentence, aligning with findings in the study by Norman *et al.* (2022). Yet our study suggests that historical TBIs are not routinely screened for or recorded by health staff. This finding represents an important gap that remains unaddressed despite the impact it could have on reducing the risk of recidivism by informing care strategies that more closely align with an individual's needs in the justice sector (Chan *et al.* 2023).

Another key finding was that participants found it difficult to distinguish the potential impact of historical TBIs

Table 3. Summary of recommendations arising from the research.

Recommendation	Rationale
Improve staff awareness of TBI	Staff were aware of some potential implications of TBI exposure on current behaviour but wanted to know more. Structured training would ensure staff have a baseline understanding of the cognitive and behavioural difficulties individuals may experience while involved in the justice sector as these can often be difficult to identify if staff members are not trained in this area (Durand <i>et al.</i> 2017). Ongoing education around TBI may include the appointment of a motivated subject matter expert, provision of accessible reference material and development of relationships with external agencies.
Establish processes for screening TBI histories	Participants reported that knowing a person's TBI history and the nature of their difficulties was helpful in assisting them to work with someone most effectively. Prior TBI is a key risk factor for longer-term consequences or delayed recovery, so it important for clinicians to know about and should be routinely assessed (Mitchell <i>et al.</i> 2017).
Establish clear health pathways to facilitate access to rehabilitation services for those with chronic difficulties, an existing claim or those with unrecovered acute injury	Awareness of available rehabilitation services and establishing clear referral processes would help to improve access for people who need additional support.
Medical review of acute assessment process for suspected TBI within prison	Need to consider broadening medical review to include standardised assessment of symptoms and need for rehabilitation services. Routine review of identification, classification and referral processes for people with a TBI through working with healthcare staff will ensure a consistent standard of care.
Clarify people's roles across the system with respect to TBI care	Participants were unclear as to whose role it was to assess a person with suspected TBI and wanted further clarification around the roles of external agencies.
Build capability to support the communication of individuals' TBI history across services	Participants expressed that it would be helpful to share knowledge of a person's TBI history as they move between services to help guide the individual's care.
Adopt consistent approaches between services	Adopting established processes from the community may support greater acceptability and uptake of new processes or procedures.
Develop a standard of care for identifying and managing TBI in the justice sector	Due to the high prevalence of TBI in NZ prisons (Mitchell <i>et al.</i> 2017), it would be beneficial to ensure there is an expectation set around the standard of care provided by staff around identifying and managing individuals in their care with TBI. Participants noted that clear communication from management around these would be useful.

from other difficulties that an individual may be experiencing, such as trauma, drug and alcohol, or mental health difficulties. Previous evidence from outside the justice sector has revealed practitioners find knowing a person's history of TBI assists with making differential diagnoses and considering whether the difficulties a person may be experiencing are due to mental health, addiction or TBI (Hyzak *et al.* 2023). This reinforces the complex healthcare needs of people within the justice sector, which may be better addressed by the nature of their impact rather than cause (Butler *et al.* 2022). Consequently, it would be important to screen for TBI alongside screening for addiction, mental health and other health conditions. There would also need to be consideration for identifying cultural or spiritual needs to ensure any screening process does not continue to marginalise indigenous populations.

Participants expressed a desire to know more about how an individual's lifetime history of TBI could affect current behaviour and other manifestations, in addition to how to support people with potential long-term effects of TBI. The Risk Need and Responsivity model adopted by the Department of Corrections (Andrews and Bonta 2010) could be used to address this challenge by taking a more holistic view of health care by identifying risks (i.e. by conducting a range of assessments), needs (i.e. by targeting treatment to the symptoms and behaviours being exhibited rather than their cause), and responsibility (i.e. developing programs in a way that recognises and supports the challenges they may be experiencing as a result of these symptoms). The findings of this study suggest a need for overarching services that embrace complexity by prioritising an individual's needs based on the consideration and integration of all their health needs, rather than looking at illness, including TBI, as discrete, unrelated phenomena.

Our findings also suggest an individual's knowledge and attitude about TBI influences access to care and is influenced by professionals' rapport building skills and knowledge about TBI. For example, participants reported that some individuals would not disclose their injury because it could result in them being injured further (e.g. by other prisoners). This aligns with previous research suggesting that probation staff rely on offenders' awareness of their injury and its potential impact in order to report it (O'Rourke *et al.* 2018). We propose that there is a need for safe processes that enable individuals to report concerns about TBI in prison settings to facilitate identification of unwitnessed potential injuries. Further, rapport building, described as building trust and respect without fear of punishment (e.g. from other prisoners or further incarceration) by custodial participants, could also be a key area to support client-individual relationships and access to health care. Indeed, poor communication with individuals can lead to frustration and disengagement from health-seeking behaviour (Capon *et al.* 2020).

Our findings also suggest that there is a need to provide health workers within the justice sector with clear health

pathways for people with suspected TBI within corrections and when transitioning into the community. International guidelines for mTBI suggest that there is a need to determine a plausible cause of injury, complete a physical examination, assess symptom presentation and follow up to ensure the person has recovered, or refer to rehabilitation services if not (Marshall *et al.* 2012). In the current study, participants described management of acute injuries with routine physical exam, including examination of blood pressure, pulse, and physical signs of trauma such as fractures, bruising, or bleeding from the ear or nose. However, barriers to screening for TBI were noted. For example, our findings did not include assessments for altered consciousness beyond loss of consciousness (such as feeling dazed or confused) or self-reported symptom presentation. There were also barriers identified by participants around the individual reporting the injury for fear of repercussions or due to lack of understanding around TBI and its potential impact. There is a continuing need to provide staff within the justice sector with screening tools to support earlier access to TBI care for those who need it (Chan *et al.* 2023).

To align with best practice, our findings point to a need for routine symptom assessment, identification of rehabilitation need, and follow up in the justice sector. Routine screening of individuals entering a new prison is feasible (Mitchell *et al.* 2017) and would provide the opportunity for appropriate health care to be accessed for historical injuries (where there are persisting deficits) and valuable information for staff (if a subsequent injury were to occur while the individual was in prison, or transitioning to the community). However, there may be barriers involved in screening for TBI (Chan *et al.* 2023), and healthcare workers may be reluctant to screen for injuries without a formalised process around further care, evident by participants advocating for policies at a national level.

Previous research suggests the importance of utilising community agencies to offer help to individuals with a TBI or a suspected TBI (Ramos *et al.* 2018). Other research has also highlighted how interventions need to be responsive to the characteristics of the individual and their functional deficits (Hughes *et al.* 2015). Interventions in the United Kingdom have been found to be highly effective when interdisciplinary collaboration was utilised to support youth who had sustained a brain injury, and subsequently there has been strong demand for this service (Kent *et al.* 2021). Linking individuals into appropriate supports when they transition from the prison to the community is likely to reduce the frequency of contact with the justice system, which could also lead to more appropriate resource management.

Our findings suggest that professionals in the justice sector want the capability to access and share individuals' health data with the justice sector and community services (with their consent). Participants felt that this would enable them to provide care that was more tailored to an individual's needs. The need for better communication also

experienced at the individual level: whose role and responsibility it was to investigate suspected past or current TBI was unclear in our findings. Probation officers noted they would refer to mental health clinicians to diagnose a TBI; however, the mental health clinician noted they were not trained in this area. The confusion was felt to put individuals at risk of being 'passed around' and a diagnosis being missed. Diagnosis by a clinician is needed to ensure a comprehensive review of medical history, physical examination, and to rule out other potential causes of presenting symptomatology (Marshall et al. 2012). We propose that explicit roles and pathways for suspected TBIs could more clearly defined to support individuals' access to care.

The overarching theme of the need for a national process highlights the interrelatedness of the sub-themes identified and demonstrates challenges and opportunities for change across the justice and health sectors related to organisational culture, workforce capacity building and health service planning and delivery. Support at a policy level was cited as a necessity to support greater consistency in individual and program practices, access to service delivery and investment in digital infrastructure. The issues identified suggest that change success is more likely if a multi-level approach is undertaken. Models of care are evidence-based and stakeholder-informed systemwide frameworks that can help guide what, where, how, and who should be involved in TBI care so that the right care is delivered by the right team, at the right time, and at the right place. Recommendations for practice change are proposed in Table 3. Future research might explore inter-sectoral readiness for change and the ingredients required to accelerate change in this important area of need.

Strengths and limitations

A key strength of this study is the representation of professionals encompassing clinical and non-clinical roles. All study participants identified opportunities to strengthen how TBI is managed specifically in the New Zealand justice sector, including the need to understand individuals' health histories, inclusive of their TBI history. Another strength of this study was the analytical approach we used to analyse the data, which initially involved the development of two independent frameworks that were later integrated, with arbitration, into a single composite framework. However, our study is not without limitations. Despite our recruitment efforts, we acknowledge that the convenience sampling approach used in this study may limit the diversity of perspectives gathered from the interviews. For example, we were unable to recruit the full spectrum of clinical (e.g. nurses, GPs) and non-clinical actors (e.g. police, justice, policymakers) and individuals engaged in the justice sector. We also have limited information about the justice sector's workforce characteristics, which precludes our ability to judge the representativeness of our sample. Due to these

limitations, we caution the transferability of our findings into settings where individuals' right to accessing care and mechanisms for healthcare provision may differ.

Conclusion

Our study revealed that justice sector professionals are aware of TBI but need systemwide support to manage the complex needs of individuals with a history of TBI. We identified inter-sectoral opportunities at the individual, service and system level to enhance TBI care. Aligning these efforts with evidence for best practice and individuals' preferences could support the most effective use of resources and outcomes for people with TBI in the justice sector.

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