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# NEW ZEALAND JOURNAL OF PHYSIOTHERAPY

- New guidelines for physiotherapy provision in aged residential care
- New Zealand physiotherapists' perceptions of STarT Back
- Upper limb directional control in severe stroke
- Instructional design features of an interprofessional education initiative
- Physiotherapists' experiences during the COVID-19 pandemic
- Lessons from physiotherapists in Pacific disasters

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PHYSIOTHERAPY
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# New Guidelines for Physiotherapy Provision in Aged Residential Care

Physiotherapy New Zealand (Older Adults Special Interest Group) have recently released the first Aotearoa New Zealand guidelines on the benefits and utilisation of physiotherapy services in aged residential care (ARC) (Physiotherapy New Zealand, 2022). The provision of physiotherapy services in ARC has long been unclear with the contractual requirements being "grey" at best. These guidelines aim to provide managers with information around the benefits of a robust and effective physiotherapy service, and the "how to" of selecting and planning for this. They are also a tool by which potential consumers of ARC services can select a provider, and a starting point to address the lack of specific funding for physiotherapy in this sector.

The vision of the Aotearoa New Zealand's Healthy Ageing Strategy (Ministry of Health, 2022) is that older people live well and age well. This commitment to wellbeing in older age should continue through the lifespan, including when a person moves into care. People admitted to ARC often present as deconditioned, frail, and with higher medical needs (Kojima, 2015). This is often linked with recent illness, deterioration, or an event that has triggered ARC admission. Utilising physiotherapy allows facilities to support their residents' physical functioning, enable their wellbeing, and rehabilitate them from injury and illness. Furthermore, physiotherapy assists the management of long-term conditions, slows the progression of long-term conditions, and delays the onset of frailty and disability.

There is robust evidence that exercise improves the ability to perform activities of daily living in ARC residents (Crocker et al., 2013). Recent international task force recommendations are that all ambulant ARC residents should have a personalised exercise programme as part of their health care plan (de Souto Barreto et al., 2016). The role of the physiotherapist is wider however than exercise programmes, with physiotherapists bringing strong assessment skills and management of a range of health conditions. Physiotherapists are also essential in determining resident safety when they are no longer independently mobile and require prescription of manual handling equipment in order to transfer and mobilise them.

The utilisation and perceived value of physiotherapy in ARC was brought to the forefront during the COVID lockdowns in Aotearoa New Zealand. Our physiotherapy colleagues across the country reported a huge range of responses from ARC facilities. Some saw physiotherapy as an "essential service" and therefore continued to allow their physiotherapists access to provide this service to their residents. Some denied access but battled on with telehealth, and many simply closed their doors and did not engage with physiotherapy for weeks and months. The staff were understandably working at levels of stress never before felt in the industry – but for those of us locked out it was a cold, harsh realisation that our value was simply not seen or appreciated. The question arose: how can we demonstrate to those who do not instinctively see what we do for residents, and how do we argue our case for access?

Those working as physiotherapists in ARC knew the damage that would occur when residents were not allowed to continue with rehabilitation, and in many cases were isolated in their rooms so even the most basic right to mobility and movement was denied. During lockdown people continued to have strokes, fracture their hips, and generally decline. Without physiotherapy input their outcomes can only have been worse.

Seeking solutions to this, a working group was formed from the Older Adults Special Interest Group (OASIG) of Physiotherapy New Zealand. The original goal was to find overseas guidelines, adapt them to an Aotearoa New Zealand environment, and start to 'prove' our effectiveness. As many people in our position will attest, this was never going to be as easy as that. With the benefits of a researcher and academic in our working group we turned to the literature and found more questions than answers. There was no clear model for how physiotherapy can be used effectively in ARC with a range of different funding models overseas and very little in the way of answers. Encouragingly, we did find that others were also asking questions. Brett et al. (2019) conducted a systematic review of 11 studies, which identified the worldwide use of physiotherapy in aged care nursing homes and found inconclusive and inconsistent evidence for best practice guidelines. Given this, the only answer was to "write them ourselves".

The guidelines took over a year to produce and were written based on the clinical experience of our working group – all senior physiotherapists heavily involved in provision of ARC services. The draft was circulated, and feedback and contributions were gratefully received from the industry and interested parties such as the University of Auckland, University of Otago, Age Concern New Zealand, the Office for Seniors (Ministry of Social Development), Ministry of Health, and ARC providers.

The guidelines include information on:

- the background and importance of physiotherapy
- when physiotherapy input is recommended – what should trigger a referral
- how much and how often
- safe, effective, and legal use of physiotherapy assistants
- facilitating access to privately funded physiotherapy for individual residents
- moving and handling training
- how to select a physiotherapist
- documentation
- service set up.

These guidelines have been needed for many years. A report to Physiotherapy New Zealand in 2010 stated "serious concerns for the decreasing number of physiotherapy hours in aged care residential facilities" (Physiotherapy for the Older Adult Special Interest Group, 2011, p. 2). The report outlined inadequate provision of physiotherapy service. In 2022, physiotherapists see extreme variation in the provision of physiotherapy, from 20+ hours per week right down to hospital-level care facilities with no weekly physiotherapy provision.

These guidelines will not only inform managers but will also be an essential guideline allowing more informed consumers to ask appropriate questions when selecting their ARC facility. Generally, physiotherapy services are listed on Eldernet (2022) as "yes/no". These guidelines will give consumers the understanding to ask detailed questions about hours of physiotherapy per week, what can be expected in terms of assessment and input for themselves or their whānau, and allow them to understand how the provision of a robust physiotherapy service can improve their experience of ARC living. Importantly, the publication of these guidelines has also been a starting point for conversation with funders of ARC. If we accept the guidelines and accept the importance of physiotherapy input for the wellbeing of our vulnerable older adults, then funding needs to follow.

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# Physiotherapists' Perceptions of Implementing STarT Back in New Zealand: A Thematic Analysis of Focus Group Data

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## ABSTRACT

STarT Back is a stratified care approach to identify and manage psychosocial risk factors for persisting low back pain and associated disability. A STarT Back course was held at the School of Physiotherapy, University of Otago, in June 2019, introducing a small cohort of physiotherapists ($n$ = 20) to the approach, including psychologically informed interventions. The study aim was to gain insight into these physiotherapists' perceptions of the feasibility of implementing STarT Back in their own practice and more widely in New Zealand. Semi-structured focus group interviews were conducted with 14 physiotherapists who attended the training course and had subsequently used STarT Back to different extents in their own practice. Data were analysed using reflexive thematic analysis. Six themes were identified: confidence in current practice; STarT Back as a useful framework; concerns over the low-risk group; difficulties in translation; education is essential; and behaviour change. The need for behaviour change was a unifying theme with interpretation aided by the Capability, Opportunity, and Motivation Behaviour (COM-B) model. Practical suggestions to enhance implementation were made, with participants identifying strategies that promoted use of STarT Back in their practice. Issues identified included concerns about care for low-risk patients, health system structure and funding, and resistance to changing usual practice. Participants were cautious about the feasibility of wider implementation of STarT Back in New Zealand.

**Chapple, C. M., McKenna, C., Hill, J., Ellis, R., Reid, D., Mani, R., Tumilty, S., & Baxter, G. D. (2022). Physiotherapists' perceptions of implementing STarT Back in New Zealand: A thematic analysis of focus group data. *New Zealand Journal of Physiotherapy, 50*(3), 106–116. https://doi.org/10.15619/NZJP/50.3.02**

Key Words: Implementation, Low Back Pain, Psychosocial Factors, Stratified Care, STarT Back

## INTRODUCTION

Low back pain (LBP) is a leading cause of disability with a profound impact on individuals, which is exacerbated if chronicity develops (Brunner et al., 2018). Globally, LBP is a major economic burden, and in New Zealand is considered the biggest contributor to health loss in terms of disability adjusted life years (DALYs) (Hoy et al., 2014; Ministry of Health, 2016; National Health Committee, 2015). In New Zealand (2020–2021), LBP cases cost the Accident Compensation Corporation

(ACC) $506 million (Analytics & Reporting – Accident Compensation Corporation, 2021).

Management of LBP is challenging. Individual patient characteristics, plus complex interactions with psychosocial factors, influence treatment response and clinical outcomes for people with LBP (Brunner et al., 2018; Cowell et al., 2018; Darlow et al., 2014). Current clinical guidelines recommend adoption of a biopsychosocial approach to care to address risk factors of poor prognosis (Almeida et al., 2018).

STarT Back is a stratified care approach to the management of LBP, which identifies psychosocial risk factors for developing persisting symptoms and disability (Hill et al., 2008). The STarT Back screening tool is used to triage patients with LBP into subgroups based on the level of risk of poor outcome with appropriate treatment matched to each subgroup (Foster et al., 2014). Treatments are: for the low-risk group, advice and education on self-management strategies; for the medium-risk group, usual physiotherapy care including manual therapy, exercise, advice to stay active, education, and reassurance; and for the high-risk group, usual physiotherapy care plus psychologically informed care (Hill et al., 2011). This approach incorporates specialised training for physiotherapists to provide the matched care (Foster et al., 2014). Developed in the United Kingdom (UK) National Health Service (NHS), STarT Back facilitates clinical decision-making for clinicians at the first point of contact with patients, providing cost-effective health care, and better patient outcomes compared to usual physiotherapy care (Hill et al., 2011).

Implementation of STarT Back in New Zealand is at an early stage, with uncertainty about how effectively STarT Back will translate into the New Zealand context. In a recent New Zealand survey, 94% of sampled physiotherapists reported screening people with LBP for psychosocial factors. Of these, 37% used formal screening tools and 22% used risk stratification tools, with STarT Back being the most common (57%) (Hill et al., 2020). The extent to which the recommended matched care is provided in New Zealand is unknown.

A training course was held at the School of Physiotherapy, University of Otago, in June 2019, introducing a small cohort of physiotherapists ($n$ = 20) to STarT Back. The physiotherapists had varied knowledge about STarT Back but none had previously attended a training course. We subsequently conducted focus groups with course participants, with the following aims:

1. To explore the experience of how physiotherapists implemented STarT Back into their practice following the training course.
2. To investigate participants' perceptions of the feasibility of wider implementation of STarT Back in New Zealand.

## METHODS

### Study design

Three focus groups were conducted to address the aims of the research. We took a constructivist approach, recognising that both the participants and the researchers would be involved in a bidirectional construction of meaning (Braun & Clarke, 2013). As we aimed to explore perceptions, we adopted a relativist stance acknowledging participants' multiple viewpoints, with none taking priority over others (Braun & Clarke, 2013). We used reflexive thematic analysis with three researchers (CC, CM, JH) collaborating in interpretation of data (Braun & Clarke, 2019). Reporting follows the Standards for Reporting Qualitative Research (SRQR) guideline (O'Brien et al., 2014).

### Researcher characteristics and reflexivity

The STarT Back New Zealand group are physiotherapists with clinical and research expertise in the conservative management of LBP. One of our main activities was to organise the STarT Back training course; consequently, we had an insider position as fellow physiotherapists, and attendees on the course (JH, ST). The facilitator of the focus groups (CC) did not attend the training course and made a conscious effort not to introduce her own opinions into the interview discussion. However, awareness of some of the potential issues did lead her to probe participants for more detail in some areas. Two researchers have clinical experience of treating people with LBP in New Zealand and the UK (CC, JH). A physiotherapy honours student (CM) conducted the initial analysis of focus group data. She was unfamiliar with STarT Back and not involved in the collection of data.

### Participants

Demographic data were collected for physiotherapists who attended the New Zealand STarT Back training course. After the course, attendees were invited to participate in focus group interviews.

### Focus group interviews

Focus group interviews were used to facilitate interaction between interviewees and promote expression of thoughts and ideas (Kitzinger, 2006). Interviews took place in October 2019, giving participants time in their clinical work to use STarT Back following the course and attend optional online follow-up sessions. They provided retrospective data from clinical records since attending the course. This included the number of patients with LBP, the number of patients where STarT Back was used, and the number of patients in each STarT Back category. The focus group interviews were conducted via Zoom (Zoom Video Communications Inc.), due to the widespread geographic location of participants. We used a semi-structured interview guide with broad open-ended questions (Table 1), followed by probing and sensitising questions to elicit deeper, more detailed information. Participants were prompted to reflect upon, discuss, and share their ideas and experiences. Each interview took approximately 50 min and was recorded using a digital voice recorder (Sony model ICD-UX523F) and Zoom recording. A research assistant made notes that were used for data checking when meaning was unclear from the transcription or recordings, and for triangulation of findings.

### Data analysis

Participants were anonymised and assigned an identification code. Two interviews were transcribed verbatim by an independent professional transcription service. One researcher (CM) transcribed the third interview and checked all transcripts against audio and visual recordings for accuracy. Analysis was conducted after all focus groups were completed.

Reflexive thematic analysis was employed following the six-phase framework described by Braun and Clarke (2006). It was

**Table 1**

*Focus Group Interview Guide*

| Study aims | Questions/line of questioning |
|---|---|
| Explore how physiotherapists implemented STarT Back into their practice following the training course | From your perspective, how have you got on implementing STarT Back in your everyday management of patients with low back pain?<br>Let's start with what has gone well (the facilitators) …<br>What helped you with this?<br>And maybe some things that did not go so well (what about the challenges/barriers? What got in the way?). |
| To investigate participants' perceptions of the feasibility of future implementation of STarT Back in New Zealand | What are your thoughts about the feasibility of implementing STarT Back at a nationwide level in New Zealand? |
| Additional comments | Does anyone have any other comments they wish to make about STarT Back – the programme itself, the training, or where to from here? |

a predominantly deductive analysis, as we were seeking answers to specific research questions. However, there were elements of inductive analysis as meaning was constructed from participants' responses (Braun & Clarke, 2013). Familiarisation with data was followed by latent coding where we sought to identify hidden meaning in the words participants used to express their views (Braun & Clarke, 2013). The codes were discussed and agreed (CM, CC). Next, the dataset was organised into possible themes and sub-themes by two researchers (CM, JH) working independently to identify patterns of shared meaning (Braun & Clarke, 2021). These were reviewed and synthesised by a third researcher (CC).

Member checking was conducted with the coding, themes, sub-themes, and quotations sent to participants for feedback.

## RESULTS

Of the 20 physiotherapists who attended the STarT Back training course, two attendees were members of the STarT Back New Zealand Group and considered to have a conflict of interest and four were unavailable, leaving 14 participants in three focus groups. The characteristics of focus group participants are presented in Table 2.

Ten participants provided data regarding their use of STarT Back since the course (Table 3). Four participants were using STarT Back with a high proportion of their patients (81/90 patients). Remaining participants saw low numbers of LBP patients or were managers who did not see patients at all, meaning they had used STarT Back infrequently or not at all.

Nine participants responded to the member checking enquiry, all of whom were satisfied with the analysis. No adjustments to the final analysis were required.

Six themes were identified: confidence in current practice; STarT Back as a useful framework; concerns over the low-risk group; difficulties in translation; education is essential; and behaviour change. Some practical suggestions to enhance implementation were made. Participant quotations supporting these themes have been tabulated (Table 4) and are referred to in the text with the prefix Q.

### Theme 1: Confidence in current practice

Participants expressed confidence in their current practice for managing people with LBP, even though their approaches were varied. Some already intentionally included assessment and management of psychosocial factors, with attendance on the training course confirming their current practice (Q1).

Others had not recognised they were addressing psychosocial factors with their patients but reported the training course led to enhanced confidence in clinical decision-making and were keen to absorb the STarT back approach into their routine practice (Q2).

Conversely, some participants expressed a preference for continuing with their existing practice relying on "hands on" techniques that they were confident produced good results with their patients and were reluctant to relinquish (Q3).

Participants identified several factors that influenced their confidence in using the approach. These included STarT Back being evidence-based (Q4), level of experience, and previous knowledge about psychosocial approaches. Experience was a strong influence on the preferred treatment approach, both in terms of previous success with patients, but also for participants' confidence in dealing with patients.

### Theme 2: STarT Back as a useful framework

Participants emphasised STarT Back was easy to use and a positive addition to their practice that helped guide management of patients with LBP (Q5). Many of the participants identified that STarT Back provided a useful framework for structuring their patient assessments (Q6). They found the tool facilitated open discussion with patients regarding psychosocial factors associated with LBP. It allowed participants to broach patients' emotions and feelings, providing an opportunity to address potentially sensitive issues (Q7). However, some participants did feel it could impede communication and disrupt building rapport with the patients (Q8).

### Theme 3: Concerns about the low-risk group

Participants appeared to have the greatest concerns about the matched care for the low-risk group, with reluctance expressed for using a single treatment session with no follow-up (Q9).

**Table 2**

*Characteristics of Focus Group Participants: Physiotherapists Who Completed the New Zealand STarT Back Training Course (*N = *14)*

| Characteristic | *n* | % |
|---|---|---|
| Age bracket (years) | | |
| 20–29 | 1 | 7 |
| 30–39 | 1 | 7 |
| 40–49 | 6 | 43 |
| 50–59 | 3 | 21 |
| 60–69 | 3 | 21 |
| 70+ | – | – |
| Gender | | |
| Male | 8 | 57 |
| Female | 6 | 43 |
| Country of undergraduate training/pre-registration | 12 | 86 |
| New Zealand | 2 | 14 |
| United Kingdom | | |
| Experience working as a physiotherapist (years) [a] | | |
| 0–9 | 1 | 7 |
| 10–19 | 3 | 21 |
| 20–29 | 6 | 43 |
| 30–39 | 1 | 7 |
| 40+ | 2 | 14 |
| Highest postgraduate qualification | | |
| Postgraduate certificate | 3 | 21 |
| Postgraduate diploma | 6 | 43 |
| Master’s degree | 5 | 36 |
| Setting of work | | |
| Public hospital/clinic | 1 | 7 |
| Private practice | 11 | 79 |
| Private organisation | 1 | 1 |
| Other [b] | 1 | 1 |
| Predominant area of work [c] | | |
| Musculoskeletal physiotherapy | 13 | 93 |
| Sports physiotherapy | 4 | 29 |
| Occupational health | 2 | 14 |
| MDT/IP team | 3 | 21 |
| Personal experience with low back pain | | |
| Yes | 12 | 86 |
| No | 2 | 14 |

*Note*. IP = interprofessional; MDT = multidisciplinary team.

[a] One response missing. [b] Education. [c] Participants could select more than one answer.

**Table 3**

*Physiotherapists’ Use of STarT Back Following the Training Course*

| Use of STarT Back by physiotherapists | Total | Mean | Range |
|---|---|---|---|
| > 1 per week (*n* = 4) | | | |
| Patients with LBP seen since training course | 90 | 22.5 | 20–26 |
| Patients with LBP seen using STarT Back screening tool | 81 | 22.3 | 17–26 |
| Number of patients seen from each risk subgroup | | | |
| Low risk | 32 | | |
| Medium risk | 34 | | |
| High risk | 15 | | |
| < 1 per week (*n* = 4) | | | |
| Patients with LBP seen since training course | 65 | 16.3 | 9–25 |
| Patients with LBP seen using STarT Back screening tool | 23 | 5.8 | 3–9 |
| Number of patients seen from each risk subgroup [a] | | | |
| Low risk | 10 | | |
| Medium risk | 9 | | |
| High risk | 2 | | |
| With 1 patient [b] (*n* = 2) | | | |
| Not using, or no data provided [c] (*n* = 4) | | | |

*Note.* [a] Risk group not given for three patients. [b] Two patients with LBP – STarT Back used with one, who was categorised as low risk. [c] Managerial role (2); Unable to extract data (1); Did not respond (1).

These concerns focused on not knowing the clinical outcomes for individual patients and whether the condition had resolved or needed further input, as well as failure to meet patient expectations, and potentially negative business impacts.

A single session was perceived to be insufficient for building rapport or providing an effective intervention. While participants accepted the argument that low-risk patients may not require extensive treatment, or could be over-treated in the current system, there was also a general feeling that one visit was insufficient to ensure an optimal outcome. Furthermore, participants expressed dissatisfaction about unknown outcomes for the low-risk patients (Q10).

Participants perceived that patient expectations of LBP management, drawn from previous experiences of physiotherapy treatment, could limit patient acceptance of the STarT Back approach, especially the education and self-management strategies recommended as the matched treatments for low-risk patients (Q11). Participants feared “mismatch” in treatment expectation could result in patient dissatisfaction and them seeking treatment elsewhere (Q12).

Given the current structure of private practice in New Zealand, some participants identified potential financial implications of matched care as a barrier for future implementation, particularly where a physiotherapist’s income relied on caseload (Q13).

**Table 4**

*Focus Group Participants' Quotations Referred To In Text*

Theme 1: Confidence in current practice

Q[a]1. I see already lots of complex clients so kind of validates what I'm seeing. (A[b]7[c])
Q2. I think it was really useful in terms of maybe giving you your confidence in decisions and yeah, improving decision making … The training gave me the confidence to do psychologically informed physio on patients that would normally just go straight into a pain programme. (A1)
Q3 … you can have a direct like cause and effect, like you do your manual therapy … they're heaps better from your treatment as such so I would struggle to know that I could do something to help them there and then not do it. (D6)
Q4. I think well I mean basically we've been doing a lot of what was talked about anyway and I think what I find refreshing as much as, that it was nice that there was research to back it up. (D2)

Theme 2: STarT Back as a useful framework

Q5. It's really easy to use and I think, so I tend to do it at the start of my subjective questioning, and it gives me, you know, a really good idea straight away, you know their risks so it's so easy to use and you just get a really good overview of what risk group they're in. (A4)
Q6. I think also that framework of how to implement it was what I got out of it the most. (M1)
Q7. [STarT Back] is really useful just in terms of confirming maybe what I was thinking but also opening up some dialogue with the patient to maybe talk about their worrying thoughts … their feelings … rather than necessarily just where their pain's coming from. (D4)
Q8. It kind of gets in the way of that rapport building so we kind of need it done in the waiting room before they come in. (D6)

Theme 3: Concerns with the low-risk group

Q9. I think the hardest one to grasp is the fact that it was being suggested that if you'd identified your patient as being low risk, that you only saw them once. I think as a group, we find that, we felt that that really was not going to work for us as to how we practised. (D2)
Q10. I think it's a concern because you lose contact with that patient for a start off and you really don't know what the outcome is. (D3)
Q11. … people expect to have a little bit more … They're paying to come and see us so if we just tell them to go home and self-manage, that's probably not what they're paying for. (A3)
Q12. We have lost probably a few patients; they've come back for different things and they've said "I ended up with a chiropractor or osteopath or something for my back", 'cause they didn't feel they'd been treated. (D6)
Q13. Looking from a business model and a clinical model … a lot of the physios are contractors so, the difficulty particularly when you are trying to implicate [implement] matched care, it does have an income impact on private business. (M2)

Theme 4: Difficulties in translation

Q14. A lot of what you're talking about with the British market with the NHS [National Health Service] and the type of clients … is quite different to here ... not only how they work but how they pay. They're not private practice ... they're hospital driven. (M2)
Q15. ACC would really have to be on board because the vast majority of the back-pain patients I see have got an ACC history. (M2)
Q16. … there are carrots and sticks and levers that ACC can put in place and have shown ... historically to change physio behaviour. (A6)
Q17. You know we would see a hugely different population of clients in the UK. Even when they were classed as acute, they were minimum six weeks down the line. It would take six weeks just to get a referral from the doctor to come through, then have a waiting list and then till you see an "acute" person. (M1)
Q18. … something like two thirds of their patients had three months of back pain before they got treatment, whereas … [in NZ] people are coming in at one week. (A5)

Theme 5: Education is essential

Q19. So, if we're going to be better at the soft skills and the biopsychosocial implementation of management, we've got to train at that and we've got to be good at that. The schools have got to run it out … so that in four years' time, everyone that's graduating will have a really good knowledge of it. (A7)
Q20. We were all senior practitioners with a lot of experience, and we still find it difficult to take that all on board … I don't think I would support it as a new grad sort of course … You really do need to have a bit of an understanding of what you're actually dealing with from experience. (D2)

Q21. It was nice to sort of, from the course content, to bring it all together as much as it was [intense] over the four days … it helped to, as others have said, be confident that in fact this is a realistic way of treating. (D1)
Q22. The four-day training course itself is very intense and those sorts of skills required, you can't learn those in a four-day workshop. (A5)
Q23. Many of the case studies they were applying weren't relevant to the population that we are dealing with … very difficult to envision how that was going to work in our practice, when the training itself is a population very different to our own. (M2)
Q24. I know the training in the UK was done over weeks blocks … I think that would be a better way of training, where you go away and you do a little bit then come back with questions. (M1)

Theme 6: Behaviour change

Q25. It's gonna obviously require a lot of training and a lot of time I think, you know, to change physios' behaviour. (A4)
Q26. It really is a heck of a lot of information to absorb and then to try and expect to change your lifelong practices or what your beliefs are or whatever to change that, because some people will say well oh this is just too hard. (D4)
Q27. I don't know if it's as hard as maybe what people think. I think that there is already some change starting to happen. (A3)
Q28. You know it's going to take time, but I think we are definitely seeing a shift. (M1)

Practicalities

Q29. We've got technology that we can actually just give them an iPad at the front desk and they can fill it out and its right there... its literally in the waiting room ... they can press a couple of buttons. (M1)
Q30. We had an in-service with staff so just to let them know what we're doing with the STarT Back tool and getting the questionnaire to patients, which has been useful. (A7)
Q31. I think an app would be perfect, you know the day and age now with an app just look at something and get some advice around education around the simple things you can do. (M1)
Q32. If you can get some research that is New Zealand specific, you have a much easier chance of getting ... people on board. (M2)

*Note.* $^{a}$ Q prefix = quotations in manuscript text. $^{b}$ A/D/M prefix relates to different focus groups. $^{c}$ number relates to individual participant.

### Theme 4: Difficulties in translation (UK to New Zealand)

Addressing concerns about the low-risk group is one of the aspects participants felt would need to be addressed if STarT Back was to be implemented widely in New Zealand. Participants identified several further potential difficulties for implementing the approach including differences in the health systems, and funding streams between the UK and New Zealand (Q14). Participants felt that successful implementation of STarT Back in New Zealand would necessitate a change in funding models, and support would be required from the ACC as they are a major funder of physiotherapy treatment for people with LBP due to injury (Q15, Q16).

Based on their own experience or knowledge of the NHS health system in the UK, participants perceived that as first contact practitioners, physiotherapists in New Zealand see patients with LBP a lot sooner than colleagues in the UK NHS secondary care sector who must wait for a doctor's referral (Q17). Participants felt the health system in New Zealand, and ACC funding, make it easier for patients to access physiotherapy earlier in their course of LBP; this was a notable difference to the NHS system where delay in referral to physiotherapy from GPs means patients may not be seen within the first few weeks (Q18).

### Theme 5: Education is essential

Education and training were raised as important considerations, with the STarT Back training requiring some adaptation to better fit the New Zealand context.

Participants suggested education of student physiotherapists about STarT Back and underlying concepts would be essential for future implementation in the New Zealand context (Q19). However, participants felt attendance on a specialist course and using the STarT Back approach would be better targeted to physiotherapists with more experience, as novice physiotherapists had other skills to focus on (Q20).

Participants' perceptions of the training course were generally positive, identifying the course as a strong facilitator for implementing STarT Back in their own clinical practice (Q21). The training was acknowledged as valuable and informative, but there was general agreement the course was too short, creating a pressured learning environment (Q22). Several participants highlighted parts of the training were out of context for the New Zealand population and healthcare system, and struggled to link case examples to their current practice (Q23).

Participants advocated an extended training course, with time to implement and reflect upon the tool in practice, and thus consolidate learning. They suggested case scenarios relevant for the New Zealand context be used to aid learning. Participants suggested structured follow-up sessions to complement the training course, enabling clinicians to connect and learn from each other's experiences (Q24).

### Theme 6: Behaviour change

Aspects of the training course were identified as facilitators for implementing STarT Back into participants' own clinical practice, with participants recognising that behaviour change would also be required to make this successful (Q25). Some participants considered shifting behaviour away from the traditional biomedical approach would be too hard for some physiotherapists (Q26). By contrast, other participants felt it was not as hard as anticipated, and education would help. It was also recognised that behaviour change in practice would take time but is already occurring (Q27, Q28).

### Practicalities

While not a theme, participants made several practical suggestions to promote implementation of STarT Back in New Zealand. Participants identified strategies for implementing STarT Back within their own practices, including involving reception staff to facilitate routine completion of the screening tool (Q29), and conducting in-service training with colleagues (Q30).

Additional suggestions were made for improving the training course (Theme 5) and use of technology to enhance education and clinical use of STarT Back (Q31).

Additionally, New Zealand-based research into STarT Back was seen as being essential to promote implementation (Q32).

## DISCUSSION

Our study aimed to explore perspectives of New Zealand STarT Back trained physiotherapists about implementing the approach in their own clinical practice, and the feasibility of wider implementation in New Zealand. As the training course was the first of its kind to be held in New Zealand, this study affords a unique perspective of experienced physiotherapists using STarT Back in the New Zealand context.

Data from the pre-focus group questionnaire, combined with focus group data, indicate different levels of participant engagement with STarT Back since the training course. Some of the participants had thoroughly embraced the approach for managing their patients with LBP. As identified in previous research, these participants valued stratifying patients based on the risk of chronicity and felt the matched care helped guide and prioritise patient needs (Caeiro et al., 2019). Other participants were more cautious, finding it hard to let go of their preferred approaches to treatment, especially for the low-risk group where STarT Back advocates self-management alone. Some participants had used STarT Back very little or not at all, mostly due to the specific requirements of their job (e.g., a managerial role). However, we encouraged all participants from the training course to participate in the qualitative study as we valued all perspectives, not only those of high users of the approach.

We identified six themes: confidence in current practice; STarT Back as a useful framework; concerns over the low-risk group, difficulties in translation; education is essential; and behaviour change.

The importance of confidence in their skills to deliver a particular type of treatment, was apparent across participants. Some felt their confidence to use STarT Back was enhanced by the training. This relationship has been noted previously, as lack of training is recognised to impact confidence in dealing with psychosocial aspects of LPB in practice, even when physiotherapists are aware of their importance (Cowell et al., 2018; Synnott et al., 2015). While perspectives included in each theme are grouped around a central concept, there is also considerable overlap between the themes. For example, the influence of training on confidence was also perceived to promote behaviour change for some participants, illustrated by their willingness to utilise the new approach.

Participants suggested extended training would enable the continued development of the skills learnt during the course, while providing clinicians with support and guidance as they work to incorporate STarT Back into practice. Research shows individuals' confidence in using a psychosocial approach is influenced to different extents by attendance on a training course, reporting difficulty integrating learning into clinical practice (Synnott et al., 2015). Our participants highlighted this issue, suggesting ongoing training beyond an initial course should be considered. Furthermore, participants felt incorporating online training into future programmes could be a facilitator for implementation by improving access to training material and resources. In recent years, Keele University has transitioned to an online training format where resources are easily accessed via the institution's website (University of Keele, 2021).

Participants reported STarT Back is easy to use and provides a useful framework for assessing and managing patients with LBP; it also enables conversations with patients about psychosocial factors. Similar themes have been identified in previous STarT Back research (Hsu et al., 2019), although some GPs have reported the closed nature of the questions in the screening tool can inhibit rapport building (Karstens et al., 2015). This perspective was identified by one physiotherapy participant, who suggested completion of the tool in the clinic reception area would overcome this issue. These findings suggest there may be diversity in perspectives of different health professionals, which has implications for wider implementation of STarT Back. Further exploration of New Zealand GPs' opinions about STarT Back is warranted.

Another potential barrier to future implementation of STarT Back is the concern expressed about management of patients in the low-risk category. The limited contact, unknown outcomes, and failure to meet patients' expectations could make this aspect of STarT Back unacceptable to some physiotherapists. Similarly, Portuguese GPs considered the proposed intervention for low-risk patients would lead to patient dissatisfaction with care (Caeiro et al., 2019). Equally important in terms of acceptability and uptake of the approach are the financial implications. Fewer appointments for the low-risk group, or loss of current or future custom due to patient dissatisfaction, are very real concerns for business owners and individual physiotherapists whose income may rely on volume of patients. Similar concerns were expressed by German physiotherapists who felt that adaptation of STarT Back to their health system would be required to prevent financial disadvantage to clinics and be necessary for successful implementation (Karstens et al., 2018).

Successful translation of STarT Back into different health and cultural contexts has not been established. Two recent trials in the United States showed low rates of stratification by primary care physicians (GPs), and subsequently low rates of referral for appropriately matched care, despite considerable efforts to provide training and support strategies (Hsu et al., 2019; Middleton et al., 2020). Some of the barriers are likely to be similar in New Zealand, such as lack of primary care physician

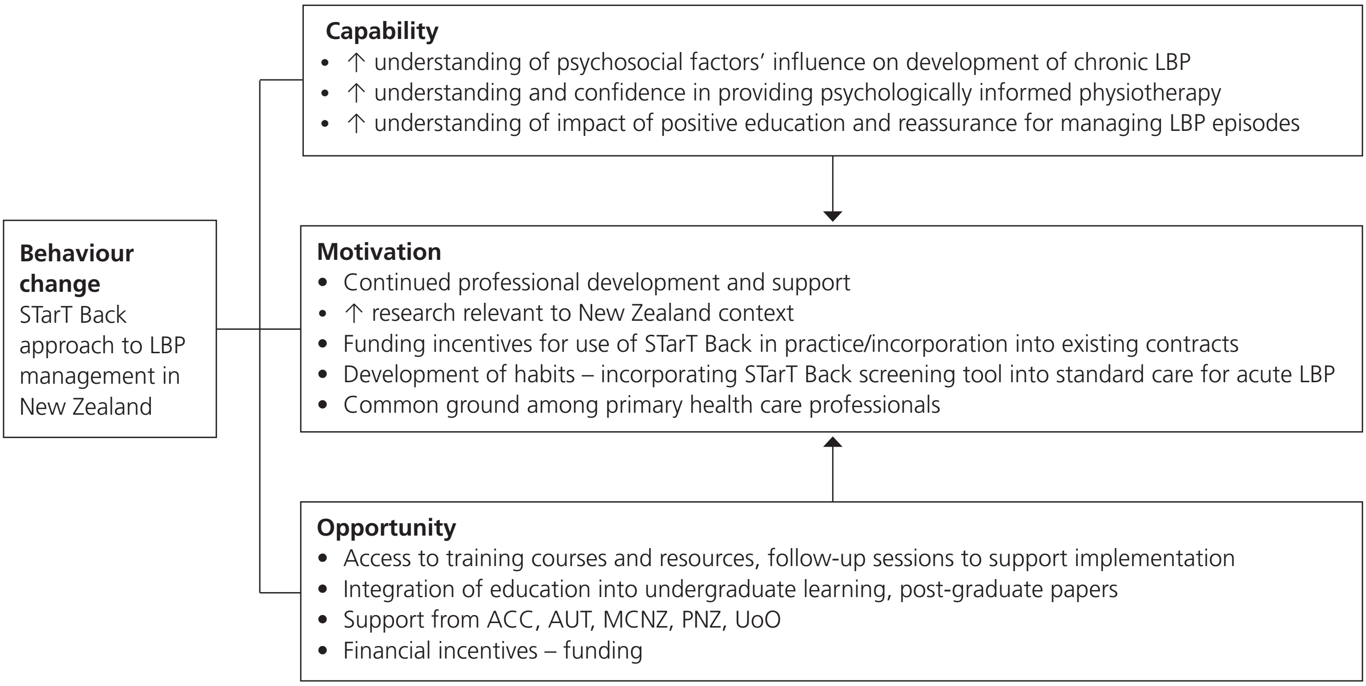
(GP) engagement, and inadequate length of appointments (Middleton et al., 2020). The most effective strategies for implementation of new treatment approaches in New Zealand primary care have yet to be identified and could be the basis of future research.

The differences in health systems, funding by ACC, and direct access to physiotherapy in New Zealand means that patients identified as medium and high risk may be seen earlier than in the UK as wait list for physiotherapy in the NHS may mean there is a delayed flow through the healthcare system. STarT Back was developed and tested on people with non-specific LBP of any duration, with the screening tool asking about behaviour of symptoms over the previous two weeks (Hill et al., 2011; Hill et al., 2008). Duration of an episode of LBP influences the predictive ability of the STarT Back screening tool, with it being less predictive for episodes < 2 weeks (Morso et al., 2016). Participants reported frequently seeing patients with acute LBP within a few days of pain onset, meaning previous research conducted in the NHS may not be directly applicable to the New Zealand context. Recognition of these differences and adaptation of STarT Back is therefore required to better suit the presentation of patients with acute LBP in the primary care context in New Zealand. In recent years, there has been an increase in private practice physiotherapy in the UK, which could enable more relevant comparisons of implementation to occur in future research.

A unifying theme underpinning the data was the concept of behaviour change. Participants perceived change in clinical practice as necessary for successful implementation of STarT Back, but this could be challenging and take time to achieve. Stimulating behaviour change of physiotherapists and other health professionals will be an important aspect when considering implementation of STarT Back in New Zealand. Effective behaviour change can be influenced by several dynamically interacting factors as conceptualised by the Capability, Opportunity, and Motivation Behaviour (COM-B) model (Michie et al., 2011). "Capability" necessitates having the requisite psychological and physical skills and knowledge; "Opportunity" involves all the external factors necessary to promote change; while "Motivation" means having the drive to make decisions and implement change (Michie et al., 2011). The training course extended *capability* by teaching the importance of psychosocial factors to effectively manage patients with LBP and created opportunities to rehearse psychologically informed skills. The course also highlighted the *opportunity* to engage in behaviour change by prompting participants to integrate the screening tool into routine practice, thus making it more likely a sustainable change to practice will occur (Michie et al., 2011). A further *opportunity* was provided by giving access to resources necessary to facilitate the use of STarT Back, which promoted professional development among colleagues, and widened the reach of the approach beyond the study cohort. Increased confidence in clinical decision-making, as described by some of our participants, can act as a reflexive *motivator* for behaviour change (Michie et al., 2011). In summary, for some participants we feel the course improved *capability* in the desired skillset and provided the opportunity to engage in the behaviour, thus enhancing their motivation to implement the desired behaviour change, that is, adoption of the STarT Back approach (Figure 1).

**Figure 1**

*Representation of Factors Influencing Implementation of STarT Back in New Zealand Using the COM-B Framework*



*Note.* ACC = Accident Compensation Corporation; AUT = Auckland University of Technology; LBP = low back pain; MCNZ = Medical Council of New Zealand; PNZ = Physiotherapy New Zealand; UoO = University of Otago.

Conversely, other participants did not exhibit behaviour change. Some felt they were already operating an approach similar to STarT Back, while others were satisfied with their current (non-psychosocial) approaches. Some participants expressed concerns with features of STarT Back itself. For example, concerns about the limited contact with patients in the low-risk category and the potential failure to meet patients' expectations would adversely affect "social opportunity" described in the COM-B framework and potentially represent a barrier to behaviour change (West & Michie, 2020). Furthermore, perceived unfavourable financial impacts from implementing STarT Back will block opportunities and be de-motivating for physiotherapists and practice owners.

### Study limitations

Generalisability of findings is limited as this was a small group of experienced physiotherapists, not necessarily representative of all physiotherapists treating people with LBP in New Zealand. We lack the insight of newly trained physiotherapists, whose perceptions of STarT Back may differ.

There were positive and negative aspects relating to the use of Zoom to conduct the focus groups. While it permitted more inclusive attendance as geographical location of participants became irrelevant, interactive discussion was somewhat constrained by only one person talking at a time. Interaction between participants is one of the main reasons for using a focus group method. In person/face-to-face discussion may have facilitated a more natural open discussion in the groups.

Conducting individual interviews via Zoom is another option and is considered an acceptable alternative to face-to-face interviews (Archibald et al., 2019). Previously, participants and researchers reported high satisfaction with the convenience and cost-effectiveness of the method, and felt it permitted good development of rapport with individuals (Archibald et al., 2019). The acceptability of online platforms such as Zoom for conducting focus groups is less certain. Our experience was that it was challenging to establish good rapport between participants, and the need for turn-taking directed by the facilitator influenced the power dynamic of the groups in favour of the facilitator. Attempts were made to mediate this with the use of humour, empathy, and by taking a stance of mutual understanding about the issues faced in clinical practice. We also ensured all participants had an opportunity to respond fully to every question, thus balancing out the contribution from individuals.

One aspect where contributions were lacking was around the financial concerns and implications of implementing STarT Back in New Zealand. A few perspectives were shared and have been discussed. However, comments were made with careful deliberation and with specific prompting from the facilitator. On reflection, this could have been an example of social desirability bias, which is the tendency to present oneself in a socially acceptable way, rather than expressing one's actual reality (Bergen & Labonté, 2020). Given the physiotherapy profession is driven by the overarching goal of providing individuals with the best care possible, this could have led to participants feeling obliged to talk more empathetically about the low-risk interventions not meeting patient expectations or resulting in poor outcomes, rather than discussing in depth the potential financial impact on their business.

No observations were made about the implications for Māori with LBP about the acceptability of STarT Back. We speculated that STarT Back might impact how Māori access primary care for LBP, but were unable to draw any conclusions. As partners under Te Tiriti o Waitangi, we must uphold principles such as tino rangatiratanga to ensure services for Māori with LBP are developed in collaboration with Māori.

### Future research

Findings from this study suggest STarT Back as developed in the UK requires adaptation for the New Zealand context. Future research should explore the accuracy of the screening tool for identifying risk of poor outcome in acute LBP of less than 2 weeks duration and investigate how stratification might change when screening is repeated at different appointments, early in the episode of LBP. Acceptability to physiotherapists and patients of the recommended matched care for the low-risk group needs further exploration. Physiotherapists' acceptance of these recommendations could be influenced by research investigating the clinical outcomes for this group. Furthermore, acceptability of STarT Back for Māori and Pacifika patients requires future research, and possible adaptation for their specific cultural context.

## CONCLUSION

The training course was valuable for some participants, generating behaviour change by extending capability, providing opportunities, and thus motivating them to implement STarT Back in their own practice. The extent of behaviour change was variable, with some participants exhibiting great enthusiasm for adopting the new approach, while others were more cautious with using STarT Back, or continued with their preferred methods for treating people with LBP. A further group felt they were already using the same principles to manage their patients, and the course reinforced their existing practice.

Participants recognised the importance of education and training in future implementation of STarT Back in New Zealand. Suggestions for improving the training course included spreading the course over a longer timeframe, utilising online training resources, and re-structuring materials to better reflect the New Zealand context.

Overall, participants affirmed the value of the STarT Back approach to managing people with LBP in New Zealand. However, they were cautious in their view about possible future implementation before health system and funding issues were addressed. Concerns about management of the low-risk group, the applicability of the STarT Back screening tool for patients with acute LBP of less than two-weeks duration, and the absence of any cultural consideration indicates STarT Back should be adapted before use in New Zealand. Variable success of the approach in health systems other than the UK NHS reinforces this need for adaptation. Any adapted approach would then need pre-implementation research to investigate its clinical- and cost-effectiveness, and predictive accuracy.

## KEY POINTS

1. STarT Back was perceived to be useful and easy to integrate into routine physiotherapy practice.
2. Education about screening and management of psychosocial risk factors for people with LBP enhances confidence and promotes change in clinical practice behaviour for some physiotherapists.
3. Stimulating behaviour change in health professionals and patients will be important for future implementation of STarT Back in New Zealand.
4. STarT Back will require some adaptation to the New Zealand context to make implementation feasible. This includes consideration of cultural factors, funding models, and health system structure.

## DISCLOSURES

We gratefully acknowledge the PNZ Scholarship Trust and the Otago Southland Physiotherapy Trust in supporting the New Zealand STarT Back training course and this preliminary evaluation. There are no conflicts of interests that may be perceived to interfere with or bias this study.

## PERMISSIONS

Ethical approval was granted by the University of Otago Human Research Ethics Committee (reference number HD19/026).

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## CONTRIBUTIONS OF AUTHORS

CC, JH, RE, DR, RE, ST and GDB conceived the project and contributed to study design. CC and GDB collected the data. CC, CM and JH undertook analysis and interpretation of data, and wrote the initial draft of the manuscript. All authors contributed to revisions and approved the final draft of the manuscript.

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# Improving Directional Control of the Upper Limb in Severe Stroke: Efficacy of the Bobath Concept: A Pilot Randomised Trial

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## ABSTRACT

This study investigated whether a brief intervention based on the Bobath concept in people with severe stroke receiving inpatient rehabilitation resulted in enhanced directional control of the upper limb compared to a control intervention. Fifty-three people with severe upper limb deficits between four to 18 weeks post stroke participated in a single blinded randomised controlled trial, in addition to usual care. Participants in the Bobath group ($n$ = 30) were allocated to six one-hour interventions. Those in the control group ($n$ = 26) received a time-matched intervention including passive or assisted active movement, positioning, and sham transcutaneous electrical nerve stimulation. The primary dependent variable was the Pre-Functional Upper Limb Test (PreFULT). Secondary measures included the Stroke Rehabilitation Assessment of Movement (STREAM), grip strength, and the Chedoke Arm and Hand Inventory. Following the intervention, the Bobath intervention group had significantly higher scores on the PreFULT than the control group ($p = 0.042$); Bobath baseline median 27.2 cm (interquartile range [IQR] 14.9, 73.4), post intervention median 59 cm (IQR 28.7, 136.4; $n$ = 29), control baseline median 21.7 cm (IQR 11.9, 39.6), post intervention median 35.8 cm (IQR 17.4, 63.8, $n$ = 24). Higher scores were observed for the STREAM post intervention for the Bobath group ($p < 0.001$). No differences between groups were observed for the other measures. Interventions based on the Bobath concept may be more beneficial for recovery of upper limb control in people with severe deficits following stroke than usual care.

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Key Words: Bobath Concept, Rehabilitation, Stroke, Upper limb

## INTRODUCTION

Recent research into recovery of the upper limb after stroke has demonstrated that persistent poor recovery is seen in a significant proportion of stroke survivors, particularly when cortico-motor pathways are disrupted (Byblow et al., 2015; Stinear et al., 2012; Stinear et al., 2017). Early recovery of movement in the upper limb is a good prognostic indicator of arm function. For those who have an absence of measurable grip strength or shoulder flexion at four weeks post stroke, there is a strong indication that the upper limb will remain non-functional (Lang et al., 2013). In this scenario, a compensatory approach is often recommended, where the focus is on improving function rather than focusing on improving impairment in the affected limb (Franck et al., 2017; Lang et al., 2013). In contrast, other investigators have sought to improve motor control of the severely affected upper limb using a variety of approaches such as robotic therapy or electromyogram-triggered electrical stimulation (Hayward et al., 2010). Reduction in impairment has been demonstrated in people with moderate to severely affected upper limb function with both robotic therapy and repetitive task practice approaches, without an accompanying improvement in function (Rodgers et al., 2019).

The most commonly utilised outcome measure of upper limb control in people with severe stroke is the upper limb motor subscale of the Fugl Meyer Scale (Franck et al., 2017; Hayward et al., 2010; Kwakkel et al., 2017). This measure is based on the Brunnstrom model of stepwise recovery, where aberrant muscle synergies are observed in early recovery, with more selective control occurring at later stages. However, the goal of treatment in people with severely affected upper limb movement after stroke may be better characterised as the pursuit of directional control of the limb rather than elicitation of aberrant synergies. Having some directional control over the upper limb may make activities of daily living tasks such as dressing easier and enhance use of the limb as a stabiliser in function (Champion et al., 2009), and potentially minimise interference to balance and gait (Carmo et al., 2012; Hirsch et al., 2005).

Demers and Levin (2017) describe arm paresis following stroke as characterised by muscle weakness, changed muscle tone, decreased sensation, and impaired voluntary movement, with the appearance of compensatory patterns, such as excessive trunk displacement and shoulder elevation and abduction commonly observed. Therapy focused on each of these elements and the minimisation of use of compensatory strategies might benefit people with severe stroke. Physiotherapy interventions based on the Bobath concept focus on facilitating selective muscle activation and more normal motor synergies for movement in the context of enhanced postural control and sensorimotor integration (Michielsen et al., 2019).

The aim of this pilot study was to investigate whether a brief series of interventions based on the Bobath concept enhanced directional control of the upper limb in severe stroke, given no previous studies have specifically addressed this question. The primary hypothesis was that a brief intervention of six sessions of rehabilitation therapy based on the Bobath concept would demonstrate greater improvement in directional control of the upper limb in people with severe, persistent upper limb deficits compared to a time matched control condition of additional usual care and sham transcutaneous electrical nerve stimulation (TENS) therapy.

## METHODS

This study was a pilot multi-centre single blind (assessor blinded) randomised controlled trial conducted in Melbourne, Australia, between 2008 and 2016. Participants were recruited by consecutive sampling from three rehabilitation centres. Ethical approval was obtained from the St Vincent's Hospital Melbourne Human Research and Ethics Committee (reference HREC A 021/2008) and Western Health Human Research and Ethics Committee (reference HREC A 111/2011). This included approval for gaining consent from next of kin where the individual with stroke did not have capacity to provide informed consent. This trial was retrospectively registered with the Australian New Zealand Clinical Trials Registry (registration number ACTRN12609000970246).

### Participants

Participants were eligible for this study if they fulfilled the following inclusion criteria: Were between four and 18 weeks post stroke, infarct or haemorrhage; were able to sit on the edge of the bed with supervision for 5 min; had visually discernible movement (slight movement) of at least one of the following in the affected upper limb: shoulder shrug, elbow flexion, or finger movement; and were able to maintain placement of the affected hand on a table and could follow two-stage commands with gesture.

Participants were excluded if they were able to reach for a cup placed on a table 50 cm in front of the body in sitting (assistance could be provided to place the hand around the cup). Individuals with ataxia, other neurological or musculoskeletal conditions limiting function, irritable shoulder pain, or a cardiac pacemaker (due to use of TENS) were also excluded.

Potential participants were identified by the physiotherapy staff of the inpatient rehabilitation units. Consent to participate was gained by a member of the investigation team. A computer-generated, blocked randomisation procedure was used, with opaque envelopes to conceal group allocation. The randomisation was stratified based on the presence of visually discernible volitional movement of the hand, including movement of thumb or an individual finger, or ability to flex the fingers and let go of flexion to command. Participants were randomised and assigned to groups by an investigator after the baseline measures were carried out.

Sample size calculation was based on preliminary data, where a large effect size for the Pre-Functional Upper Limb Test (PreFULT) was demonstrated (Cohen's $d = 0.8$) (Luke, 2007). With power set at 0.8 and alpha at 0.05, the study required 26 participants per group to test such effects. Allowing for the dropout rate experienced in the preliminary study (17%), the total number of participants required was 62.

### Outcome measures

The primary outcome measure was a measurement tool specifically designed for this study, the PreFULT (Luke, 2007). This outcome measure was developed to assess directional control of the upper limb in people with severe movement deficits, in response to a perceived lack of suitable instruments available in the clinical setting. The PreFULT measures the distance the participant can move a computer mouse on a Union Jack template in eight different directions (see Appendix A for details). The distance the mouse travels down each direction, without crossing the boundaries, is measured and added together for a summed score. The test is completed three times and the average score utilised. Pilot data on the PreFULT has shown high test re-test reliability (intraclass correlation coefficient [ICC] = 0.97) and responsiveness to a brief series of interventions (Luke, 2007).

The secondary outcome measures in this study were used to evaluate active movement control and included the upper limb items of the simplified Stroke Rehabilitation Assessment of Movement (STREAM) (Hsueh et al., 2006), grip strength (Boissey et al., 1999), and bilateral arm function as per the Chedoke Arm and Hand Activity Inventory (CAHAI) (Barreca et al., 2005). The upper limb items of the simplified STREAM evaluate seven isolated movements and three combined movements of the shoulder, elbow, forearm, and wrist and hand on a three-point ordinal scale; 0 for no movement, 1 for part range or full range with deviations, and 2 for full range in a normal pattern (Finch et al., 2009; Hsueh et al., 2006). The upper limb items of the STREAM have high inter-rater reliability (ICC = 0.95) (Wang et al., 2002) and a smallest real difference of 2.8 points (Hsueh et al., 2008). The CAHAI-9 version is a measure of use of the upper limbs across nine functional tasks, where the level of assistance required to achieve the task bilaterally is scored on a scale of 1–7 (Barreca et al., 2006). This measure enables the use of the affected limb in a secondary role as a stabiliser for some tasks, potentially having less of a floor effect than other functional measures of upper limb recovery. Grip strength was measured with a dynamometer with the arm supported on a table and the shoulder in neutral and the elbow at $90^0$ flexion, with assistance provided to maintain neutral forearm rotation and prevent wrist flexion.

Measures were obtained by an assessor (SB) blinded to group allocation. Assessments were conducted between one to five days prior to commencement of the intervention and between one to five days following completion of the six intervention sessions. The order of testing was standardised, with the PreFULT tests conducted first, followed by the STREAM, grip strength, and the CAHAI.

### Interventions

All participants received six one-hour sessions over a period of two weeks, additional to their usual care. Usual care in the participating rehabilitation units included physiotherapy and occupational therapy sessions provided either daily or several times a week. These sessions may have included therapy directed towards the upper limb; however, therapy sessions may have had a greater focus on activities enabling discharge home such as mobility in physiotherapy and independence in daily living activities in occupational therapy.

Participants allocated to the experimental group received interventions based on the Bobath concept. Bobath-based interventions were individually prescribed (Michielsen et al., 2019) in response to assessment findings with regard to postural abilities, motor control of the upper limb, sensory impairments, and the presence or absence of disorders such as neglect and dyspraxia. The treatments provided included promoting postural control for selective movement, facilitation of specific muscle activation and inter-joint co-ordination, facilitation of more normal movement patterns during task performance, and upper limb activities, both novel and daily life activities, in many postures (Champion, 2009). To further characterise interventions based on the Bobath concept, two case studies with participants with differing underlying impairments (poor postural control and dyspraxia) are available online at www.bobathaustralia.org/publications/ULcasestudies.

Participants allocated to the control condition received a time-matched upper limb intervention representing additional usual care plus a sham intervention. Active assisted or passive movements of the arm were performed in supine with 10 attempts at the following movements: shoulder flexion (maximum 90°)/extension, elbow flexion/extension, forearm pronation/supination, wrist flexion/extension, and finger flexion/extension across the full range of movement unless limited by pain. The participant was encouraged to attempt the movements, which were performed slowly. If the participant was unable to contribute, the movement was completed passively. Shoulder prolonged positioning was conducted in supported sitting with the shoulder placed in 90° abduction and external rotation, with the elbow extended for 10 min. If this position was painful, the shoulder was positioned and supported as close to this position as could be achieved without pain. This usual care intervention shares elements with the Concise Arm and Hand Rehabilitation Approach in Stroke (CARAS) protocol for upper limb recovery, where the focus of therapy for those with minimal movement was "taking care and prevention", including positioning, maintaining joint and muscle mobility, strategies for minimising discomfort, and exercises provoking voluntary movement where possible (Franck et al., 2017).

Sham TENS was applied for 20 min in supine, with the arm beside the body. Prior to commencing, the function of the TENS unit was demonstrated by applying the TENS to the less affected side and determining the dose where the participant could feel the tingling sensation. Participants were told that a dose slightly lower than this would be applied to the affected side and that they may or may not feel it. The TENS unit was attached in the same way to the affected shoulder with the control unit out of sight and not switched on. In the ethical review process, permission was granted for this degree of deception to encourage participants to view the two interventions as equivalent to control for the placebo effect.

It should be noted that the original study design registered with ANZCTR involved a sham intervention only rather than usual care plus a sham component. The sham intervention only involved passive movement of the upper limb. However, this was immediately identified as unsustainable. Participants were eager to attempt active movement during the therapist's movement of the upper limb and preventing this would remove all attempts at blinding the participant to the intervention being investigated. Therefore, the design of the control group was modified to usual care plus sham TENS.

Both interventions were performed by physiotherapists with at least 5 years' postgraduate experience and 2 years' experience in the fields of rehabilitation or neurology. In addition, therapists providing the Bobath intervention had to have completed a minimum of two advanced Bobath courses. All interventions were provided on a one-to-one basis. Seven physiotherapists were involved in delivering both interventions.

### Data analysis

Data from interval scored outcome measures (PreFULT and grip strength) were screened for normality to determine the appropriate statistical tests. If data met assumptions of normality, the planned statistical analyses detailed in the clinical trial registry included assessing between group differences for parametric variables using one-way analyses of variances (ANOVA). However, the data did not meet assumptions of normality, (PreFULT skewness 1.5, standard error [SE] 0.33, kurtosis 1.65, SE 0.64; grip strength skewness 4.0, SE 0.33, kurtosis 18.37, SE 0.65). Therefore, all data were analysed with non-parametric statistics, including the Wilcoxin signed ranks test for within group analysis and the Mann Whitney U for between group analysis.

## RESULTS

Fifty-six participants were recruited to the trial with 53 completing both the baseline and follow-up testing sessions (Figure 1). Demographics and medical data for participants who completed the study are shown in Table 1, with baseline and post intervention data for each outcome variable presented in Table 2.

**Figure 1**

*Participant Flow Diagram*

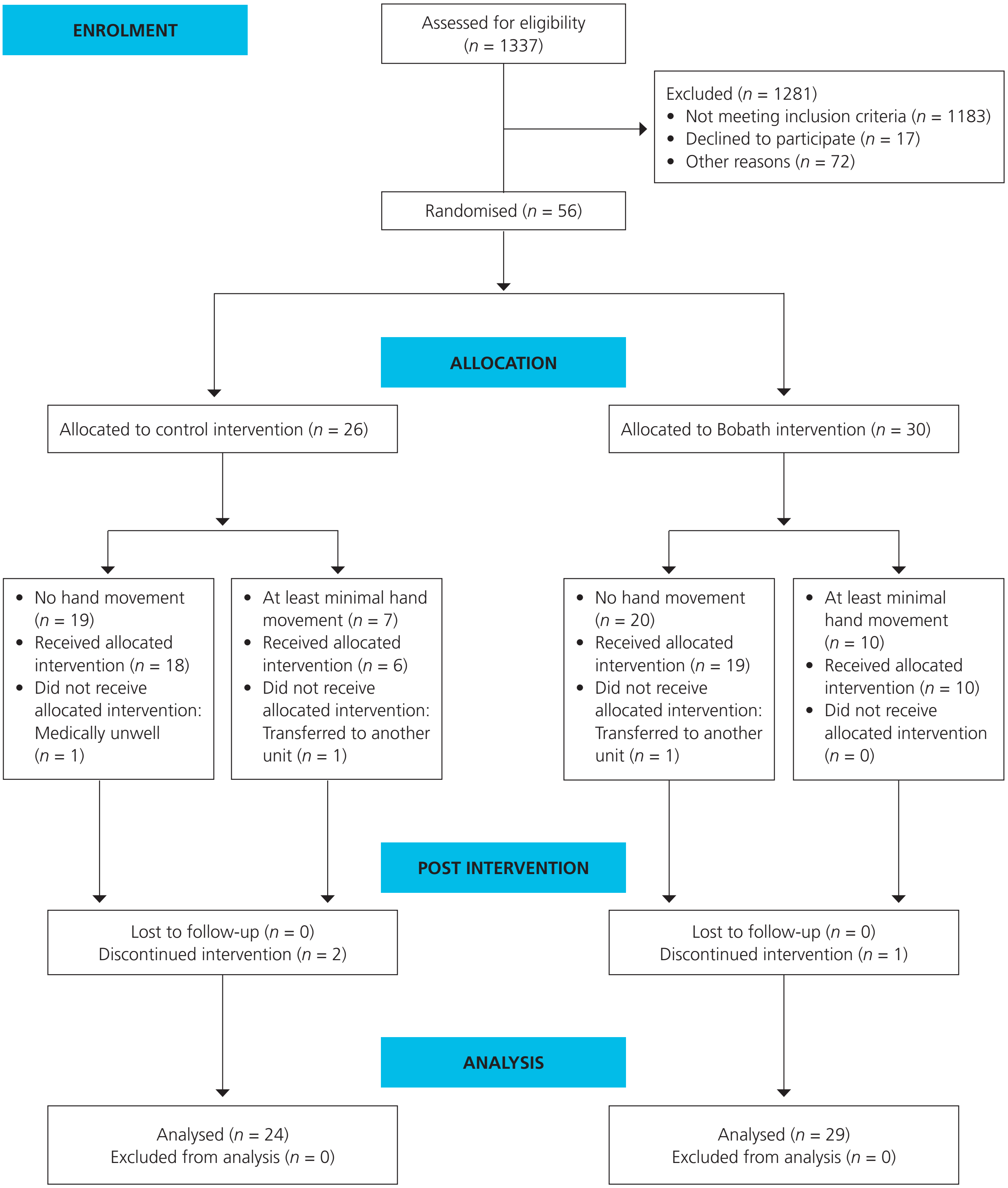


**Table 1**

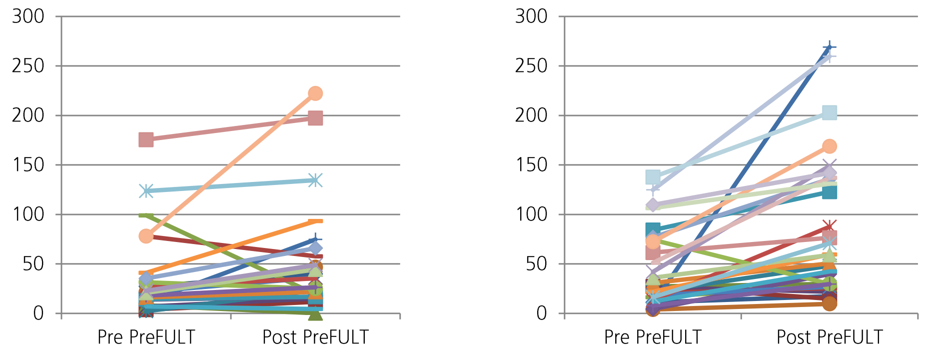
*Demographic and Medical Variables*

| Characteristic | Control group<br>(*n* = 24) | | Bobath group<br>(*n* = 29) | | *p* |
|---|---|---|---|---|---|
| | *n* | % | *n* | % | |
| Age (years), mean (SD) | 57.4 (15.7) | | 60.8 (15.2) | | 0.44 |
| Gender | | | | | |
| Male | 15 | 62.5 | 15 | 51.7 | |
| Female | 9 | 37.5 | 14 | 48.3 | |
| Time since stroke (days), mean (SD) | 57.4 (21.2) | | 67.5 (28.4) | | 0.24 |
| Side of hemiparesis, right | 14 | 58.3 | 15 | 48.3 | |
| Pathology, infarct | 15 | 62.5 | 18 | 62.1 | |

At baseline, no significant differences were observed between groups for all measures. Within group analysis showed improvement in scores for both groups for all variables except the control condition for the STREAM assessment ($p = 0.22$) (Table 2). Post intervention, significant differences between the two groups were observed for two of the variables, the PreFULT and the STREAM, in favour of the Bobath intervention (Figure 2). No significant differences were observed for grip strength or the CAHAI. The comparison between groups for the main dependent variable, the PreFULT, was conducted using intention to treat principles, with the baseline score carried forward for the three non-completing patients. This yielded similar results with a significant difference favouring the Bobath group (Bobath median 59 [IQR 28.7, 136.5]; control median 35.9 [IQR 18.6, 59.76], $p = 0.045$).

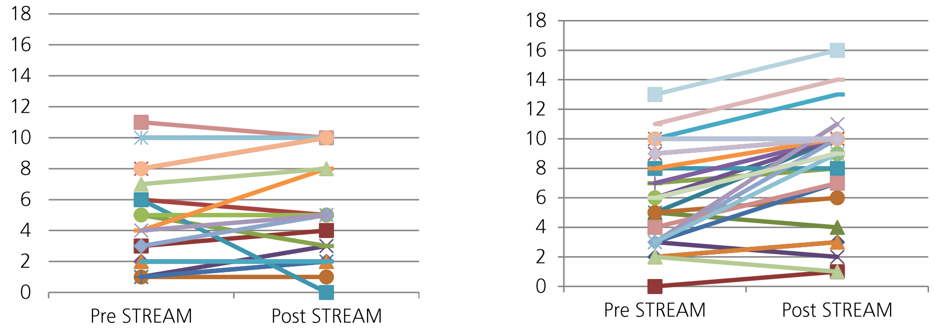
**Figure 2**

*Baseline and Post-intervention Scores for Individual Participants*



a) Control group

b) Bobath intervention group



c) Control group

d) Bobath intervention group

*Note.* Each individual is represented by a different coloured line. PreFULT = Pre-functional upper limb test; STREAM = Stroke Rehabilitation Assessment of Movement.

**Table 2**

*Baseline and Post-intervention Measures for Outcome Variables*

| Measure<br>Group | Baseline | | Post-intervention | | Within group significance | Between group significance | |
|---|---|---|---|---|---|---|---|
| | *Mdn* | IQR | *Mdn* | IQR | | Baseline | Post-intervention |
| PreFULT (cm) | | | | | | | |
| Bobath | 27.2 | 14.9, 73.4 | 59.0 | 28.7, 136.4 | < 0.001* | 0.372 | 0.042 |
| Control | 21.7 | 11.9, 39.6 | 35.8 | 17.4, 63.8 | 0.005* | | |
| STREAM | | | | | | | |
| Bobath | 6 | 3, 9 | 9 | 6.5, 10 | < 0.001* | 0.096 | < 0.001* |
| Control | 4 | 2, 8 | 4.5 | 2, 8.8 | 0.223 | | |
| Grip strength (kg) | | | | | | | |
| Bobath [a] | 0 | 0, 0.16 | 0.05 | 0, .37 | 0.013* | 0.991 | 0.838 |
| Control | 0 | 0, 0.22 | 0.05 | 0, .59 | 0.003* | | |
| CAHAI | | | | | | | |
| Bobath [a] | 10.0 | 9.0, 12.8 | 10.5 | 9.0, 14.8 | 0.001* | 0.819 | 1.00 |
| Control [b] | 9.5 | 9.0, 12.3 | 11.0 | 9.0, 12.8 | 0.017* | | |

*Note.* Number of participants in Bobath group = 29 and control group = 24, except where indicated. CAHAI = Chedoke Arm and Hand Inventory 9 (scored out of a total of 63, higher is better); IQR = interquartile range; PreFULT = Pre-Functional Upper Limb Test (scored out of a total of 300; higher is better); STREAM = Stroke Rehabilitation Assessment of Movement upper limb subscale (scored out of a total of 20; higher is better).

[a] $n = 28$. [b] $n = 22$. * $p < 0.05$.

## DISCUSSION

This study investigated whether people with minimal recovery of the upper limb between four and 16 weeks after stroke can demonstrate improvement in motor control of the limb following interventions based on the Bobath concept. The results indicate that a brief series of interventions based on the Bobath concept may be more effective in improving the ability to perform directional movements of reaching on a table top with some precision, as measured by the PreFULT, compared to interventions based on additional usual care. Similar improvements in motor control were observed for the STREAM.

The approach to upper limb recovery after stroke has been the subject of debate in recent times. The negative results from large trials investigating the effectiveness of task-oriented therapy with intensive practice (Lang et al., 2016; Winstein et al., 2016) have caused some authors to reconsider future directions for rehabilitation of the upper limb. Demers and Levin (2017) recommend a greater focus on quality of movement (temporal and spatial joint co-ordination and muscle activation patterns) as well as movement outcomes. Similarly, Krakauer and Cortés (2018) argue that a non-task oriented approach may be more beneficial for recovery from motor impairment, minimising compensatory strategies, and facilitating directional control. The Bobath concept has a strong focus on quality of movement, where manual facilitation by the therapist is a tool utilised to improve muscle activation for the initiation of movement and inter-joint co-ordination during movement (Levin & Panturin, 2011). Interventions involve a wide repertoire of upper limb activities in many different postures to regain selective control of the upper limb even where damage to the cortex from stroke is too great to enable functional hand use (Champion et al., 2009). It should be noted that the benefits observed for directional control of the upper limb in this study resulted from a brief intervention of six one-hour sessions. Use of the Bobath concept is resource intensive, requiring one-to-one interaction with a skilled therapist. However, this may be as cost effective as other therapies if relatively small doses of therapy can improve motor control.

Both the Bobath intervention group and the control group improved in their movement control abilities with a small amount of therapeutic input. This was an unexpected finding. We deliberately selected participants who were beyond a four-week window of early recovery to focus on persistent, severe upper limb deficits. In contrast, in our preliminary study, participants showed no improvement over a two-week period, then significant improvement with additional interventions based on the Bobath concept. Those in the control group may have benefitted from the systematically applied assisted active movements as well as the additional focus on the upper limb.

In considering the outcomes of this study, it must be acknowledged that there has been limited investigation of reliability and validity of the primary dependent variable, the PreFULT. This measure was chosen for the study as a simple clinical test that can yield data about precision of movement control in people with severe upper limb deficits post stroke. We chose to use this test rather than commonly used tools for severe upper limb deficits, such as the Fugl Meyer upper limb motor subscale, because we were interested in whether the person with stroke could improve in precision of movement rather than simply produce movements in a relatively unspecified way. The PreFULT can be used to investigate trajectories of movement in the clinical setting. The test requires the patient to maintain hand posture on the mouse while moving the arm, limiting use of abnormal synergies, while the use of a back brace limits compensatory trunk movement (Michaelsen et al., 2006). It is notable that all participants were able to score above zero in this test, showing minimal floor effects, whereas, in contrast, the median score for grip strength at baseline was zero. In this study, the PreFULT was shown to be responsive to change following a brief intervention. Unlike most measures suitable for severe upper limb deficits, the PreFULT is less dependent on subjective ratings of quality or range of movement. The test yields objective data that initial investigations indicate might have excellent reliability (Luke, 2007).

For the STREAM assessment, the Bobath intervention group achieved significantly higher scores following the intervention beyond the smallest real difference of 2.8 points, whereas the control group did not achieve significant change. However, there was a trend for higher scores at baseline in the Bobath intervention group. Small improvements were noted for both groups for the secondary variables of grip strength and the CAHAI; however, no differences between groups were observed. This was not surprising as we did not anticipate functional changes from such a brief series of interventions. Rather we were interested in whether people with stroke could develop some directional control of the upper limb; that it is neither hanging dependent and unresponsive to the body, or stiff and immobile, interfering with mobility.

Other limitations to this study pertain to the relatively small sample size. There was a tendency for the Bobath group to have higher sores at baseline for most of the variables, although this did not reach significance. It should be noted that the study was single blinded, with blinding of the assessors only. Due to the requirements of informed consent, participants were aware of the intervention they were randomised to; however, as described previously, the consent form presented the two interventions as equivalent. The therapists also were aware of the intervention being delivered. For these reasons, the conclusions from the study must be tentative and require reproduction in another sample. Also, no follow-up evaluations were undertaken to determine whether the improvements were maintained over time. Future research should consider whether these changes are maintained and whether having some directional control of the limb has benefits for people with severe stroke who are unlikely to have return of selective hand function.

This pilot study has demonstrated that investigating Bobath-based interventions for people with severe deficits of the upper limb post stroke in the subacute inpatient phase is feasible. Increasing the number of centres recruiting participants or including centres with larger cohorts of people with stroke would reduce the time taken to achieve recruitment targets in future studies. Inclusion of participants who required next-of-kin consent because of cognitive or communication deficits was vital in this study in order to achieve a representative sample of people with severe stroke and to meet recruitment targets.

## CONCLUSION

The results of this study indicate that directional control of the upper limb can improve with a brief intervention even with severe, persistent upper limb deficits following stroke. Interventions based on the Bobath concept may be more beneficial than additional usual care. The PreFULT appears to be a promising approach to measurement in the clinical scenario.

## KEY POINTS

1. Directional control of the upper limb in people with severe stroke can improve with a brief intervention.
2. Interventions based on the Bobath concept may be beneficial for recovery of directional control of the upper limb.
3. The PreFULT may be a useful clinical measure for demonstrating improvement in upper limb control in severe stroke.

## DISCLOSURES

Three organisations provided funding support for this project: the Stroke Foundation, St Vincent's Hospital Melbourne Research Endowment Fund, and the International Bobath Instructor Training Association.

Kim Brock and Melissa Birnbaum are members of the International Bobath Instructor Training Association.

## PERMISSIONS

This study was approved by the St Vincent's Hospital Melbourne Human Research and Ethics Committee (reference: HREC A 021/08). Informed consent was obtained from participants or from their next of kin.

Photographs in the case studies (available online) were taken with informed consent as a sub-study of the main study. Additionally, facial features have been obscured to protect anonymity.

## ACKNOWLEDGEMENTS

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## CONTRIBUTIONS OF AUTHORS

KB and CL initiated the study and developed the study design. JT, JS and SB were provider physiotherapists and contributed to the interpretation of results and revision of the manuscript. KB was responsible for data processing and analysis and writing of the first manuscript draft. All authors approved the final draft.

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# Appendix A

## TESTING EQUIPMENT AND PROCEDURES FOR THE PREFULT

### Testing equipment

- A template of paper 110 x 60 cm with 8 x 2 cm wide lines drawn in a Union Jack formation including a vertical line, horizontal line and two lines intersecting at 45°.
- Drafting tracing paper sufficient to cover the template.
- Clips to hold the template and tracing paper in place on a table.
- A computer mouse with the ink tube of a pen inserted through a drilled hole.
- A rigid spinal brace (Knight Taylor Brace, Kydex).

### Procedures

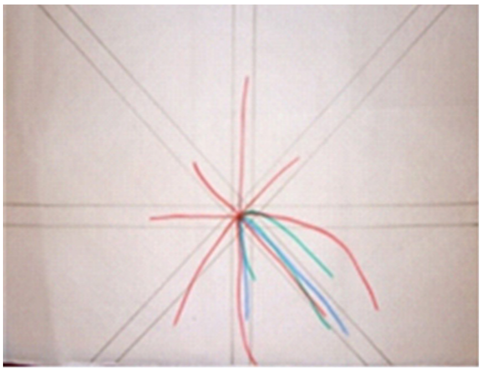
- The participant sits at a seat without armrests and the spinal brace is strapped to the chair with Velcro straps at 90° angles in front of a table. The participant's rib cage is perpendicular to the support (Figure 3).
- The participant's xiphisternum is in line with the centre marker.
- The height of the table is adjusted to the level of the participant's olecranon.
- The shoulder straps are adjusted to allow the width of three fingers to fit under the strap. This is to allow some movement of the upper trunk and scapula but to restrict movement of the hips and lower trunk away from the backrest.
- The table is moved as close to 10 cm from the xiphisternum as possible.
- The template on the table is positioned so the centre point is 60% of the length of the participant's forearm away from the edge (i.e., centre point is 10 cm + 60% of length of forearm away from xiphisternum).
- The non-hemiplegic hand is placed palm down on the table, elbow supported and shoulder in neutral.
- The participant's hand is placed on the computer mouse with the distal interphalangeal joint of the index finger next to the pen, the middle finger distal interphalangeal joint on the other side of the pen, and the thumb on the side of the mouse. The assessor moves the hand and mouse to the centre marker so the top of the mouse is on the intersecting lines of Line 1.
- The participant's olecranon must be resting on the table. If this is not possible, due to body shape constraints, then the table may be moved closer to the xiphisternum until the elbow can rest on the table and the new distance recorded.
- If the mouse does not remain on the centre marker when the assessor removes their assistance, the assessor places the participant's palm down on the table flat for 15 s and reattempts to place the hand on the mouse again. If the hand does not remain on the centre marker after three attempts, testing must be discontinued.
- The participant is instructed to "move the pen between the lines as far as you can. Let me know when you cannot go any further and I will move your hand back". When the participant can no longer move the mouse further along the line, the assessor lifts the hand back to the centre marker for the next trial.
- The participant performs three trials on each line in each direction. The participant starts with the line at 45° from the horizontal, opposite to the hemiplegic side, followed by the line moving directly vertical away from their body and then continuing around the lines in the same clockwise or anticlockwise direction. The assessor marks each line as the first, second, or third attempt.
- On completing the task, the assessor measures the score. The furthest distance the pen reaches between the 2 cm-wide line or the furthest point where the pen leaves the 2 cm-wide line and is unable to return is measured as shown in Figure 2. If the pen trace did not leave the centre square surrounding the centre marker, the trial is recorded as 0 as shown in Figure 4. All three trials of each line are recorded.

**Figure 3**

*Set Up of the PreFULT Task*

**Figure 4**

*Measurement of PreFULT Task*



# Insights About Instructional Design Features of an Interprofessional Education Initiative Involving Clinical Reasoning with Physiotherapy and Medicine Students

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## ABSTRACT

Interprofessional education aims to prepare students in health professional programmes for collaborative practice. Because of its ubiquity in healthcare, clinical reasoning can be used as a vehicle for designing interprofessional education initiatives. However, little is known about how design features of interprofessional education initiatives involving clinical reasoning are experienced by students from different professions. This evaluation study aimed to identify design features from feedback provided by students from two health professions after participating in an interprofessional education workshop involving clinical reasoning. Content analysis was used to analyse written responses from 88 fourth-year undergraduate medicine and physiotherapy students (80% response rate). Eight design features were identified and three of them were represented disproportionately when professions were compared. More medicine students requested practice presenting cases, whereas more physiotherapy students suggested emphasis on management reasoning and expressed appreciation for exchanging professional perspectives and working collaboratively. Features common to both groups of students were requests for a greater focus on case discussions, guidance about how to think about case information, explanations about how to apply knowledge to the cases, more demonstrations of how experienced clinicians think, and opportunities to learn how to be open to possibilities and consider the bigger picture. These insights can be used by educators when they design interprofessional education initiatives featuring clinical reasoning.

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Key Words: Case-Based Learning, Clinical Reasoning, Instructional Design, Interprofessional Education, Medicine, Physiotherapy

## INTRODUCTION

Interprofessional education is promoted as an integral component of health professional programmes because it provides students with experiences intended to enable them to work collaboratively with each other in their future practice as healthcare professionals (Australian Medical Council, 2012; Frenk et al., 2010; Physiotherapy Board of New Zealand, 2019; World Health Organization, 2010). To build interprofessional competencies, educators design instruction that requires students to interact as they discuss and apply concepts and skills that are common among health professions (Buring et al., 2009; Reeves et al., 2016; Rogers et al., 2017; Young et al., 2020). One skill featured in interprofessional education initiatives is clinical reasoning (Gummesson et al., 2018; Hanum & Findyartini, 2020; Miles et al., 2016; Seif et al., 2014). Foundational evidence provides some insights on student preferences and educator perspectives with interprofessional education initiatives involving clinical reasoning exercises. A comparison of feedback from different health programme students is yet to be established to better understand design features of interprofessional education initiatives. Consequently, it is unclear how the instructional design features used in interprofessional education workshops that involve clinical reasoning may impact how students develop interprofessional competencies. The absence of such insight is an important gap in the literature as professional accreditation bodies and educators continue to advocate for the inclusion of opportunities for students to learn interprofessional competencies in their pre-registration education programmes. This situation poses a question for instructional designers and educators to consider: if clinical reasoning is used as a vehicle to learn interprofessional competencies, then what instructional features in the design of interprofessional education initiatives might optimise outcomes for different groups of health profession students?

Clinical reasoning can be defined as the sum of the thinking and decision-making processes associated with clinical practice (Higgs, 2018). However, the roles health professionals play when providing person-centred care can have an impact on how clinical reasoning may be viewed by practitioners (Young et al., 2020). A doctor may view clinical reasoning as a means of arriving at a diagnosis or generating a problem list (Croskerry, 2009a; Trowbridge et al., 2015). A physiotherapist may also view clinical reasoning as hypothesis-oriented; however, this view may emphasise movement and collaboration with a patient (Chowdhury & Bjorbækmo 2017; Hendricks, 2021; Hess, 2021; Huhn et al., 2019). Diverse perspectives about clinical reasoning can provide a vehicle for generating rich discussions among students from different professions that also support the development of interprofessional competencies

(Hanum & Findyartini, 2020). Recommended instructional design features for interprofessional education initiatives vary depending on the theoretical perspective underpinning the recommendations. When clinical reasoning is viewed primarily as a thinking process, recommendations include providing students with explicit opportunities to practise deliberately and reflect upon their use of intuitive and analytical thinking process because the former is context-dependent, whereas, the latter can be learned in more theoretical or abstract situations (Connor & Dhaliwal, 2015; Croskerry, 2009b; Trowbridge et al., 2015). When clinical reasoning is viewed as a process of enculturation into professional practice, then recommendations emphasise providing students with opportunities to develop problem-solving capabilities that involve tasks, situations, and interactions with others that increase in complexity, ambiguity, and authenticity over time (Higgs 2018; Wijbenga et al., 2019). Interprofessional education initiatives involving clinical reasoning appear to use instructional strategies that address the thinking processes and professional practice dimensions of clinical reasoning. Examples of such strategies are case-based role playing in a classroom setting (Gummesson et al., 2018), vignettes used to structure interactions in simulated ward environment (Miles et al., 2016), and mentorship to support immersion in collaborative student-led patient care experiences (Seif et al., 2014). Consequently, the recommended instructional design features for interprofessional education initiatives involving clinical reasoning are well-grounded in educational theory and supported by evaluation studies reporting student satisfaction. Missing from the literature, however, are studies that analyse feedback from students to specifically provide insights about instructional design features.

Students are uniquely positioned to provide insights to instructional designers about possible trade-offs between opportunities to apply and practise profession-specific clinical reasoning skills and opportunities to build interprofessional competencies in interprofessional education initiatives (O'Keefe & Ward, 2018). Insights might also be gained by exploring how students from different professions may experience this type of interprofessional education initiative. Therefore, this evaluation study aimed to identify instructional design features in feedback provided by students from different professions after participating in an interprofessional education initiative involving clinical reasoning.

## METHODS

A mixed methods approach (Creswell & Creswell, 2018) featuring content analysis (Hsieh & Shannon, 2005) was used to address the aim of this study. This approach enabled categories representing instructional design features identified in student feedback to be developed independent of profession, followed by a comparison of category frequencies by profession (Castro et al., 2010; Nzabonimpa, 2018). Ethical approval was obtained from the Human Ethics Committee at the University of Otago (D17/420), including consultation with the Ngāi Tahu Research Consultation Committee.

### Participants and setting

This study took place at the University of Otago with fourth-year undergraduate students in medicine and physiotherapy programmes during their first week of class in Dunedin, New Zealand. Medicine students were mid-way through their six-year Bachelor of Medicine and Bachelor of Surgery degree, while physiotherapy students were starting the final year of their four-year Bachelor of Physiotherapy degree. For both professions, the fourth year is when the undergraduate course becomes primarily based in clinical workplace environments. All students had at least one prior interprofessional education experience in their third year. This prior experience involved three two-hour workshops where students from medicine, physiotherapy, and pharmacy worked in small groups of approximately four people per group to learn about each other's professions while studying the topic of smoking cessation with case scenarios. These experiences are part of a university-led interprofessional education strategy (O'Brien et al., 2015).

This study explored a three-hour clinical reasoning workshop attended by all fourth-year students in medicine ($n$ = 80) and physiotherapy ($n$ = 30) on the main university campus. To coordinate staff and resources, the workshop was pragmatically scheduled at a time when both groups of students were preparing for clinical placements and when clinical reasoning workshops for each group previously occurred separately. The goals of the workshop were for students to use and further develop their clinical reasoning skills in an interprofessional setting. Existing clinical reasoning workshop material developed for the medicine students was adapted by the first author (EK) to enhance its relevance to physiotherapy students. Three cases were prepared that contained presenting complaints related to the head, chest, and abdomen with associated signs and symptoms, history, and results from examinations and investigations that would be familiar to medicine and physiotherapy students. Students were divided into small groups of approximately four people, with each group containing at least one physiotherapy student. The workshop was facilitated by five medicine doctors, two physiotherapists, one interprofessional education administrator, and one education advisor. The facilitators modelled how to explain their thinking aloud using a framework for clinical reasoning based on the Calgary–Cambridge communication method (Kurtz & Silverman, 1996; Silverman et al., 2013). This communication method was familiar to medicine students because it was taught to them in the early years of the medicine programme. The clinical reasoning framework was developed by educators at the medical school and reviewed by the first author and deemed suitable for use with physiotherapy students because it was compatible with the communication method they had been familiarised to. The clinical reasoning framework provided students with guidance for communication with a patient to initiate a consultation and build a relationship, gather and analyse information about the presenting problem and symptoms, perform a relevant physical examination, and end with an explanation and plan involving a differential diagnosis or problem list. After modelling how to use the framework, students were invited to work through the three cases in their small groups. Students were encouraged to share their thoughts about case information using a *think aloud* technique that was familiar to both groups of students (Pinnock et al., 2015). This technique balanced conveying clinical reasoning as a thinking process and professional practice because it facilitated discussion about the importance or meaning of case information. The case information was presented to students one paragraph at a time. Facilitators circulated among the groups to encourage discussion about the information presented in each paragraph and to support links between their ideas before progressing to the next paragraph. Each case ended with a brief verbal case presentation where students were asked to provide a succinct case summary or hand over to another health professional.

### Data collection and analysis

All students were invited to complete an evaluation questionnaire at the end of the workshop, which formed the data for this research. The questionnaire was developed by the teaching team when the workshop was designed to prompt open-ended reflection and feedback comments. The four prompts for reflection were:

1. What part of today's session about clinical reasoning did you find most helpful/useful?
2. How might clinical reasoning help when you take your next history?
3. What do you want to learn more about?
4. Please suggest an improvement for our next clinical reasoning workshop with you.

Written responses were collected from all students who consented to participate in the study. All data were collected on the same day from participants and de-identified before analysis to protect students' anonymity. Students noted their profession; no further demographic information was collected.

All data analyses were performed by the authors using a content analysis approach (Hsieh & Shannon, 2005). Content analysis was chosen as a flexible approach to quantifying qualitative data and comparing design features in feedback provided by students from different professions after participating in an interprofessional education initiative involving clinical reasoning (Castro et al., 2010; Nzabonimpa, 2018). To address this aim, the researchers collated the questionnaire responses blind to profession. The questionnaire data were parallel coded independently by both researchers using qualitative data analysis software, HyperResearch (ResearchWare, Version 3.7.3, Randolph, MA). More than one category code could be applied to text in written responses. Next, the researchers met to discuss the codes and identify a limited number of categories. Any differences were discussed until resolved by achieving 100% consensus. Descriptive categories were created with limited abstraction (Vaismoradi et al., 2016). This decision addressed the large number of relatively short text responses and our intention to subsequently compare categories of responses by profession. At this point, we interpreted the categories of responses as design features according to the elements in the systems model of teaching and learning (Biggs, 1993) and used in published reviews about interprofessional education initiatives (Hammick et al., 2007; Reeves et al., 2016). The systems model outlines three components of teaching and learning: presage, process, and product. The presage component includes student and teaching context factors such as the prior knowledge and expectations learners and teachers bring with them to the learning environment. The process component encompasses how deeply students engage with the task. The product component addresses how and what was learned by students. The use of the systems model enabled us to interpret the categorical results as instructional design features as seen from the students' perspective of how they perceived and contributed to the teaching context, how they engaged with and participated in the think aloud task, and what they thought about learning clinical reasoning skills with peers from another health professional programme.

To compare the instructional design features by profession, the eight categories identified from the qualitative content analysis were quantified (Elo et al., 2014; Hsieh & Shannon, 2005). All responses were read independently by both authors. Each response was assigned to as many categories as matched the content of the response. The frequencies and percentages were calculated to show the relative prevalence of each category in the two professions. Prevalence data were analysed using chi-square tests. The null hypothesis was that there would be no difference in the number of medicine and physiotherapy students in each of the eight categories. Since there are no other published accounts of statistical results for comparing medicine and physiotherapy feedback responses from an interprofessional clinical reasoning workshop, effect sizes of 0.10, 0.30, 0.50 were interpreted to be small, medium, and large, respectively, as suggested by Cohen (1988) for chi-square tests with 1 degree of freedom. All statistics were calculated using IBM SPSS (Version 25, Armonk, NY) with an alpha level of 0.05.

## RESULTS

Sixty-five medicine students and 23 physiotherapy students (81% and 77% response rates, respectively) consented to participate in this study and completed the questionnaire. Eight instructional design features were identified from student responses from both professions. Support for the null hypothesis was indicated by the results of the chi-square tests for five of the eight instructional design features: participating in case-focused discussions, receiving guidance about clinical reasoning, applying clinical reasoning cases, observing clinical reasoning modelled by clinicians, and seeing benefits of learning clinical reasoning. Table 1 summarises the findings and presents the results of the statistical analyses of the prevalence data.

A significant relationship with a medium effect was found between responses from medicine and physiotherapy students about "communicating and collaborating interprofessionally". Medicine students were less likely than physiotherapy students to respond about "learning from different perspectives" (Participant (P)80 Physio). A significant relationship with a medium effect was found between responses from medicine and physiotherapy students about "practising presenting cases to each other". Medicine students were more likely than physiotherapy students to request more "practice giving case presentations" (P34 Med). A significant relationship with a large effect was found between responses from medicine and physiotherapy students about "emphasising management reasoning". Medicine students were much less likely than physiotherapy students to ask for "more relevance to physio" (P29 Physio) with an increased emphasis on reasoning beyond the diagnosis to include management reasoning.

**Table 1**

*Instructional Design Features Identified in Feedback from Medicine and Physiotherapy Students*

| Instructional design feature | Representative responses | Medicine (*n* = 65) | | Physiotherapy (*n* = 23) | | $\chi^2$ | *p* | Effect size $\phi$ |
|---|---|---|---|---|---|---|---|---|
| | | *n* | % | *n* | % | | | |
| 1. Communicating and collaborating interprofessionally | Getting ideas from students in other professions (P23 Physio)<br>Meeting med students was helpful, to understand their scope, knowledge, ideas, etc. (P29 Physio)<br>Good to practise, good collaboration with physio (P41 Med)<br>Working in team and discussing (P70 Med) | 30 | 46 | 17 | 74 | 5.262 | 0.022 | –0.245 |
| 2. Participating in case-focused discussions | Need longer on each case please (P1 Med)<br>Less role-play, more case time (P12 Med) | 41 | 63 | 5 | 22 | 1.773 | 0.183 | ns |
| 3. Receiving guidance about clinical reasoning | Learning how clinicians think while taking a history going through cases (P45 Med)<br>Give experience in how to guide thinking (P67 Physio)<br>Help me structure and come to more accurate conclusions and patient specific differential diagnosis (P88 Physio) | 34 | 52 | 15 | 65 | 1.147 | 0.284 | ns |
| 4. Applying clinical reasoning to cases | Working on the cases (P2 Med)<br>Going through case studies (P42 Physio) | 34 | 52 | 7 | 30 | 3.266 | 0.071 | ns |
| 5. Practising presenting cases | How to make succinct summary about patient during handovers in ward (P21 Med)<br>Case presentations – feedback on good/bad (P46 Med) | 22 | 34 | 2 | 9 | 5.418 | 0.020 | 0.248 |
| 6. Observing clinical reasoning modelled by clinicians | Hearing more docs think out loud (P3 Med)<br>Need some extra demonstration of clinical reasoning by scenarios to show how to do it (P19 Med) | 14 | 22 | 6 | 26 | 0.200 | 0.655 | ns |
| 7. Seeing benefits of learning clinical reasoning | Help me to think through all possibilities (P13 Med)<br>Keep different possibilities open (P58 Physio)<br>Try to get a big picture before giving diagnosis (P73 Physio) | 13 | 20 | 6 | 26 | 0.372 | 0.542 | ns |
| 8. Emphasising management reasoning | More treatment ideas rather than a diagnosis driven session (P11 Physio)<br>Management treatment plans after diagnosis for different conditions (P43 Med) | 4 | 6 | 10 | 44 | 17.691 | < 0.001 | -–0.448 |

*Note.* Med = medicine student; ns = not significant; P = participant; Physio = physiotherapy student. Percentages rounded to the nearest whole number.

## DISCUSSION

This study generates findings of interest to educators designing interprofessional education initiatives that feature professional skills such as clinical reasoning. The results of this study suggest that medicine and physiotherapy students had similar perceptions about the instructional design features of an interprofessional education workshop about clinical reasoning, with three notable differences. Similarities encompass instructional design features intended to support students to learn clinical reasoning skills such as "receiving guidance about clinical reasoning", "applying clinical reasoning to cases", and "seeing the benefits of learning clinical reasoning". These findings provide insights about how competencies of health professional groups other than medicine can be developed in interprofessional education contexts (Faresjö et al., 2007; Rogers et al., 2017). Requests for more time spent "participating in case-focused discussions" and "observing clinical reasoning modelled by clinicians" reflect design features of the workshop that were valued and could be enhanced. These two requests are in alignment with findings from studies involving medicine students learning clinical reasoning (Audétat et al., 2017; Connor & Dhaliwal, 2015; Croskerry, 2009b; Trowbridge et al., 2015) and were also considered applicable to physiotherapy students.

However, there were notable differences between professions in the prevalence of feedback on three instructional design features. The first difference was the greater prevalence of requests for emphasising management reasoning from physiotherapy students. Feedback such as "more long term input where physios would more likely be involved" (P82 Physio) suggests that case materials supported discussions that were weighted more towards diagnostic reasoning than management reasoning. Medicine students also noted that the case materials were "very doctor focused" (P57 Med). These findings are not surprising given the different professional perspectives on clinical reasoning (Cook et al., 2018; Higgs, 2018; Young et al., 2020). From an instructional design perspective, case materials can be altered to increase emphasis on management reasoning. One option might be to extend the timeline of the case to include short- and long-term management, and potentially follow-up information.

The second difference was the greater prevalence of feedback about communicating and collaborating interprofessionally from physiotherapy students. A comment about the usefulness of the workshop was interpreted to indicate appreciation for the opportunity to "work together using each other's expertise and build upon the clinical picture" (P58 Physio). This finding may indicate that physiotherapy students had greater awareness of two core interprofessional competencies during the workshop: role understanding and interprofessional communication (Interprofessional Education Collaborative, 2016; Orchard et al., 2010; Rogers et al., 2017; Suter et al., 2009). When viewed from an instructional design perspective, this difference may have been due to the approximately 3:1 ratio of medicine to physiotherapy students in the workshop. Physiotherapy students may have felt compelled to work collaboratively in small groups if they were the only person representing input from their profession's perspective. Consequently, small group composition may have influenced the balance of professional views articulated in discussions. A future study could examine the impact of the proportion of professions represented in small groups on how learning outcomes are experienced among students from each profession.

The third difference was the greater prevalence of requests from medicine students for practising presenting cases. Medicine students felt "nervous" (P34 Med) about presenting cases and requested additional practice with "different formats so it's less rehearsed sounding" (P35 Med). This concern expressed by medicine students may reflect a greater emphasis on case presentations by clinical educators in their programme. When considered from an instructional design perspective, requests for more opportunities to practise presenting cases can be viewed as reflecting the priorities of the medicine programme and an emphasis on developing diagnostic reasoning skills. In the context of learning clinical reasoning, presenting a case is analogous to problem representation and is recognised as a valuable focus of attention in learning diagnostic reasoning (Audétat et al., 2017; Connor & Dhaliwal, 2015; Croskerry, 2009b; Trowbridge et al., 2015). Future workshops could include more opportunities to present cases for both groups of students by varying the format to include other contexts such as a ward-based face-to-face handover, a note written to a general practitioner or physiotherapist, or a conversation with a patient about their management plan.

The findings from this research highlight the ability of a shared case-based clinical reasoning workshop to surface both common and different professional perspectives. As also reported by Burgess et al. (2020), both medicine and physiotherapy students appreciated the opportunity to work together and gain another professional perspective on patient cases. The interprofessional context of the workshop created opportunities to broaden student and educator perspectives of clinical reasoning, consistent with descriptions of clinical reasoning as a thinking process and an encultured practice influenced by professional occupations (Connor & Dhaliwal, 2015; Croskerry, 2009b; Higgs, 2018; Trowbridge et al., 2015; Wijbenga et al., 2019). Findings from this workshop could be enriched with further data collection from students and by including staff perspectives; however, the workshop has not been repeated to date due to timetabling impasses and resource costs for nine staff to facilitate a session with 110 students despite having multi-level support that is vital for interprofessional education initiatives to succeed (de Vries-Erich et al., 2017). The mixed methods approach allowed the authors to identify and compare instructional design features from the limited evaluation feedback generated by the questionnaire given to the students at the end of the workshop that neither a qualitative nor a quantitative approach could achieve alone. Even though the quantitative phase of analysis involved the use of statistical analyses to determine which instructional design features differed in prevalence between professional groups, results should be considered indicative due to the overarching interpretivist perspective underpinning this study. While others may view these two approaches to data analysis as incompatible, we support the view that different approaches can offer insights that may be inaccessible by each approach on its own (Castro et al., 2010; Nzabonimpa, 2018).

## CONCLUSION

Findings from this study expand our understanding of the instructional features perceived by students when educators design interprofessional education initiatives that involve clinical reasoning. Medicine and physiotherapy students were found to make similar comments and requests about participating in case-focused discussions, receiving guidance about clinical reasoning, applying clinical reasoning cases, observing clinical reasoning modelled by clinicians, and seeing benefits of learning clinical reasoning. Notably, there was a greater prevalence of comments about communicating and collaborating interprofessionally and emphasising management reasoning among physiotherapy students, whereas requests for practising presenting cases were more prevalent among medicine students. We interpreted these differences as instructional features that can be adjusted to better suit medicine and physiotherapy students when they participate in an interprofessional education workshop involving clinical reasoning. Insights generated by this study may help educators to enhance their efforts when designing interprofessional education initiatives that feature clinical reasoning or other shared competencies of different health professional groups.

## KEY POINTS

1. Eight features were identified from 88 responses from students in medicine and physiotherapy programmes about the instructional design of an interprofessional education workshop featuring clinical reasoning.
2. Five features were similarly prevalent in both groups: participating in case-focused discussions, receiving guidance about clinical reasoning, applying clinical reasoning to cases, observing clinical reasoning modelled by clinicians, and seeing benefits of learning clinical reasoning.
3. Among physiotherapy students, there was a greater prevalence of comments about communicating and collaborating interprofessionally and emphasising management reasoning, whereas requests for practising presenting cases were more prevalent among medicine students.
4. Findings can be used by educators to consider how they might adjust the design of interprofessional education initiatives that address shared competencies of different health professional groups.

## DISCLOSURES

No funding was obtained for the study. The authors report no conflicts of interest that may be perceived to interfere with or bias this study.

## PERMISSIONS

Ethical approval was obtained from the Human Ethics Committee at the University of Otago (D17/420).

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## CONTRIBUTIONS OF AUTHORS

Both authors (EK and MA) contributed to all aspects of this research including design, data collection, analysis, drafting and editing of the manuscript.

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# An Investigation of the Experiences of Physiotherapists During the Aotearoa New Zealand COVID-19 Pandemic 2020

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## ABSTRACT

Mental distress associated with the COVID-19 pandemic is recognised among frontline health professionals. Experiences of physiotherapists in New Zealand during the initial outbreak in early 2020 were explored in an online survey made available to members of the professional association in February 2021. Respondents (*n* = 326) included physiotherapists from both the public and private sectors. Mental distress was a key factor across all workplaces: 48% (*n* = 132) experienced stress and 44% (*n* = 120) felt anxious and overwhelmed. Furthermore, despite being "essential workers", 55% (*n* = 11) of physiotherapists working in acute hospitals were excluded from collaborations due to misconceptions about their roles by other health professionals or poor communication. Respondents from acute hospital settings encountered a lack of training (30%; *n* = 10) and those from both acute, non-acute/community settings experienced inadequate access to personal protective equipment (44%; *n* = 19). Study outcomes suggest more work needs to be done at the managerial level to understand and support the contribution physiotherapists make as key members of the interprofessional team and to support physiotherapists' wellbeing across all workplaces.

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Key Words: COVID-19, Mental Health, Pandemic, Physiotherapists

## INTRODUCTION

The outbreak of the coronavirus disease (COVID-19) caused by a coronavirus known as the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) took the world by storm following its discovery in December 2019, and has yet to show signs of slowing down (World Health Organization, 2021a). As at June 2022, the number of registered cases worldwide had surpassed 540 million, with more than six million lives lost and numbers are still growing (World Health Organization, 2022). As the virus that causes COVID-19 is mainly transmitted through droplets or aerosols generated by coughing, sneezing, or exhalation, physiotherapists working in close contact with patients with suspected or confirmed COVID-19 are at a high risk of contracting the virus (World Health Organization, 2021b).

Emerging literature globally has revealed that physiotherapists were not prepared to work under pandemic conditions due to various reasons. In a qualitative exploratory study, physiotherapists working across 11 public hospitals in Spain reported feeling overwhelmed and described the outbreak as an apocalypse, highlighting the lack of pandemic preparedness (Palacios-Ceña et al., 2021). A separate survey study conducted in Poland found that all 106 physiotherapists working in hospitals whose data were included in the survey experienced high rates of emotional exhaustion, scoring an average of 32.31 on the Pasikowski burnout scale (where scores above 27 indicate high burnout) (Pniak et al., 2021). Common factors attributing to the mental stress and lack of pandemic readiness included inadequate access to appropriate personal protective equipment (PPE), barriers to communication, and inadequate training (Billings et al., 2021; Hoernke et al., 2021; Vindrola-Padros et al., 2020).

While New Zealand managed to learn from the rest of the world and suppress the virus effectively through public health measures during the early phases of the pandemic (Ministry of Health, 2021d), this does not mean physiotherapists were immune from the psychological burden and distress associated with their work and work environment during the pandemic. Furthermore, physiotherapists will continue to be challenged due to the ongoing pattern of the resurgence of the SARS-CoV-2 virus, with new variants of the virus emerging across the globe (World Health Organization, 2021c). The importance of learning from the initial pandemic is paramount to better prepare physiotherapists in practice as well as for their wellbeing.

Therefore, this research project aimed to explore the experiences of physiotherapists during the first wave of the pandemic in 2020. Professional work experience, including symptoms experienced that were associated with physical or emotional stress; engagement in physiotherapy services; training in the management of patients with suspected or confirmed COVID-19; and access to PPE were explored. Lessons learnt from the outcomes of this study may assist physiotherapists to prepare for the future while the COVID-19 pandemic continues, and for similar potential events.

## METHODS

### Study design, setting, and ethics

The research was undertaken as a collaboration between the School of Physiotherapy at the University of Otago and the Cardiorespiratory Special Interest Group (CRSIG) of Physiotherapy New Zealand (PNZ), the national physiotherapy professional body. The concept of a survey was developed in May 2020 in response to informal reports of inconsistent access to PPE by physiotherapists, received by the CRSIG committee. This is a mixed-method study involving the analysis of a data set obtained from the first four sections (Appendix A), of a larger survey that comprised eight sections. Sections 1–4 asked questions about the initial lockdown (demographics, professional work experience, PPE access, and personal safety/wellbeing) when New Zealand went into alert levels 3 and 4 in March–June 2020, in response to the COVID-19 pandemic (4 being the highest of the four-tiered alert level system) (New Zealand Government, 2021). Not included were sections 5, which related to support systems, and sections 6–8, which were relevant only to those living in Auckland during the second lockdown in August 2020. The survey was administered between February and March 2021. Ethics approval was obtained from the University of Otago Human Ethics Committee (reference number D21/054) and Māori consultation was also undertaken.

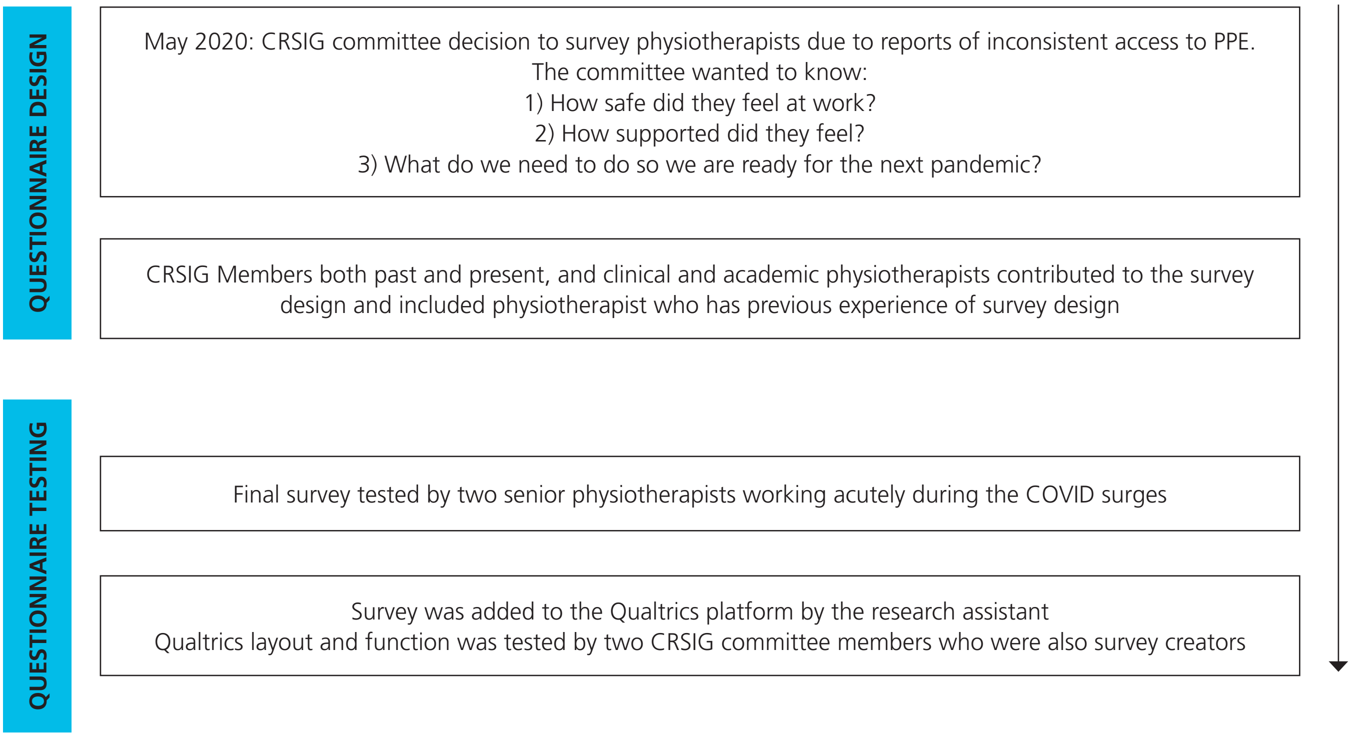
A cross-sectional exploratory approach was utilised for the research. Figure 1 details the survey development, including the objectives of the survey, how it was pilot tested, and survey dissemination. Three physiotherapists experienced in questionnaire development drafted the survey. Where relevant, a Likert scale was adopted for answers to reduce bias (Likert, 1932). The final draft questionnaire was trialled by two senior physiotherapists who worked in a District Health Board during the lockdowns. Based on their responses, small revisions were made to ensure the content validity was established. The final survey was then placed into Qualtrics$^{XM}$ (Provo, Utah, USA) by the research assistant and tested for flow by JM and BE (Figure 1).

### Participants

The survey target population was physiotherapists in New Zealand. An invitation to participate in the Qualtrics-based online survey was sent via a group email on 2 March 2021, to all PNZ members, numbering over 4,100 members (Physiotherapy New Zealand, 2020). Subsequently, a link to the Qualtrics$^{XM}$ survey was separately disseminated via two Facebook pages on 8 March 2021 – "Physio Stand Up" (1,400 members) and "Physio Board" (1,900 members) – some of whom would have received the initial invitation. An information sheet and the

**Figure 1**

*Details of the Survey Creation*



*Note.* CRSIG = Cardiorespiratory Special Interest Group [of Physiotherapy New Zealand]; PPE = personal protective equipment.

questionnaire were made available to members via the PNZ website. Clicking on the survey link implied informed consent. Survey respondents could choose not to answer particular questions in the survey. A reminder email was circulated by PNZ on 22 March 2021, before the survey closed on 31 March 2021.

## Data collection

The raw data collated from each of the surveys completed and returned were recorded on an excel file. Responses were deidentified by assigning a numerical ID to each survey.

Section 1 included demographic data regarding ethnicity, duration of physiotherapy practice, highest professional qualification, usual workplace(s), and vulnerability status (e.g., immunocompromised, pregnant, over 70 years of age) during the lockdown. Section 2 related to the experiences of respondents across the range of workplaces, and summary descriptions of training or education that physiotherapists received about their role in managing patients with suspected or confirmed COVID-19 during alert levels 3 and 4. Section 3 comprised questions about respondents' accessibility to PPE; and section 4 related to information regarding the personal wellbeing of respondents during alert level 4. Examples taken to illustrate the purpose of survey questions in answering the research questions can be found in Appendix A, Table A1.

## Data processing

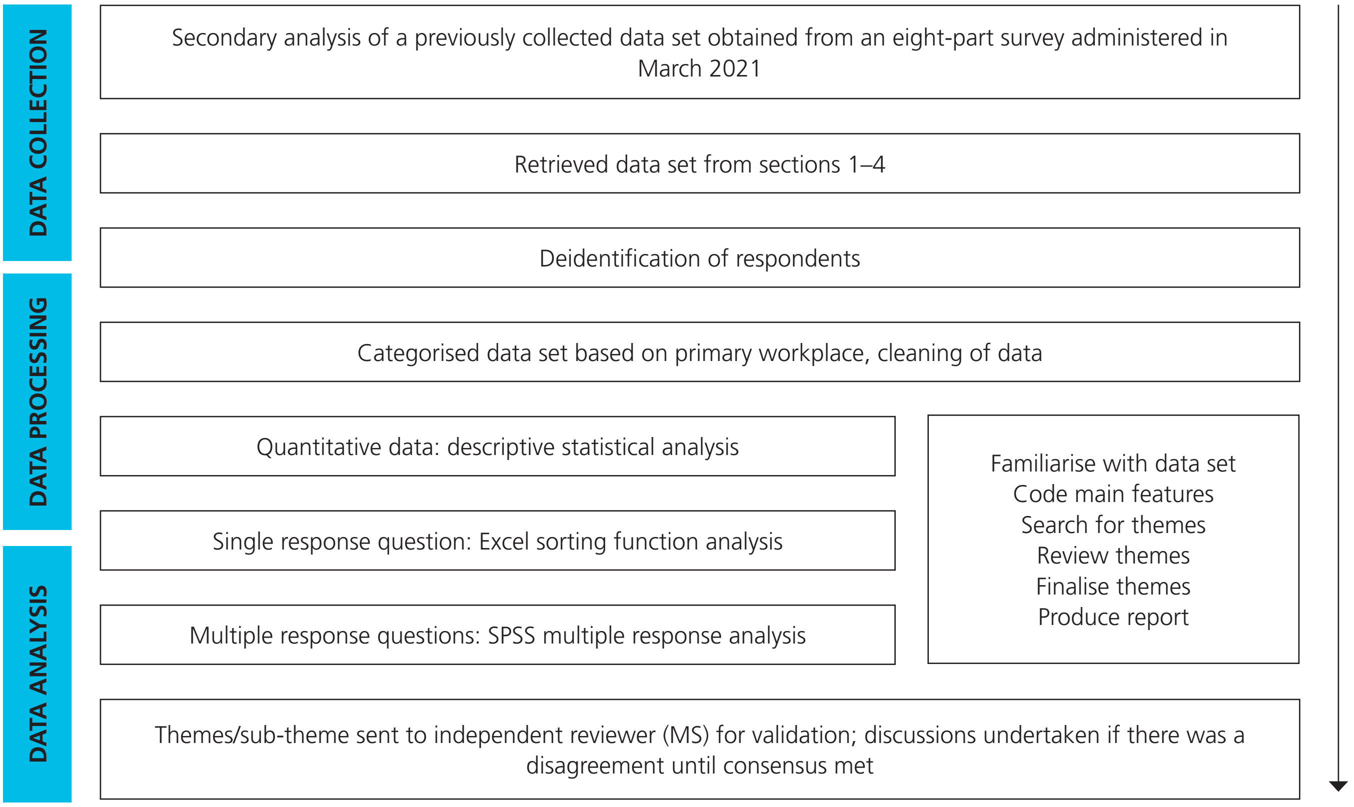
In Section 1, ethnicity groups were classified per the level one recommendation from Statistics New Zealand (Ethnicity New Zealand Standard Classification 2005 V22.1.0). The 21 responses for the "usual workplace(s)" were grouped under six workplace descriptors (Appendix A, Table A2). In Section 2, the seven "primary places or work" indicated during alert levels 3 and 4 were grouped under five workplace descriptors: telehealth; acute hospital (both tertiary and rural hospitals); not working; non-clinical work from home; and non-acute hospital/community (rehabilitation hospital and community). The data were then analysed according to those five descriptors to obtain a cross-section of workplace experiences during alert levels 3 and 4. Data cleaning was then performed for each question to account for any missing responses. Figure 2 illustrates the flowchart of methodology used in this study.

## Data analysis

The data were analysed using the IBM SPSS Statistics for Macintosh (Version 27.0.1) and Microsoft Excel for Macintosh (Version 16.53). Descriptive statistical analysis was undertaken for multiple choice questions to derive the frequency and percentages of categorical data that were coded. Responses with missing data were not included in the analysis of the particular question. Questions with single responses were analysed using the Excel data sorting function, while those where multiple responses were allowed were analysed using the SPSS multiple responses analysis function (Figure 2).

**Figure 2**

*Flowchart of Methodology*



*Note.* SPSS = IBM SPSS Statistics for Macintosh; MS = Margot Skinner.

Thematic analysis of the comments received from open-ended questions was performed by PHG to make sense of the narratives and identify major concepts within the data set (Braun & Clarke, 2006). The main features of the data were analysed in a deductive and semantic manner. Codes with similar meanings were clustered together to search for common themes and sub-themes. The prefinal themes were then reviewed in relation to the coded data set before being confirmed by PHG and MS. To enhance the trustworthiness of the interpretation of the comments, an Excel spreadsheet containing comments of respondents along with the themes and sub-themes derived by PHG was sent to MS for consensus checking. Discussions were undertaken if there were disagreements regarding the themes until a consensus was met (Figure 2).

## RESULTS

### Characteristics of respondents

A total of 326 surveys were returned. All questions in Sections 1–4 were completed by 80% (*n* = 261) of the participants. Table 1 summarises the characteristics of the respondents who participated in the survey. The majority identified their ethnic background as European (86%; *n* = 307) and 6% (*n* = 18) as Māori. The vast majority had been in practice for more than 10 years (78%; *n* = 253), and 64% (*n* = 205) of the 325 respondents had postgraduate qualifications. Over half of the respondents worked in private practices (51%; *n* = 211), with 20% (*n* = 81) in community care. Others were involved in hospital work (inpatient: 12%; *n* = 48 and outpatient: 11%; *n* = 45) (Table 1).

During alert levels 3 and 4, about three-quarters of the respondents were working from home doing telehealth (50%; *n* = 158), non-clinical work (10%; *n* = 31), or not working (16%; *n* = 50). Seventeen per cent of respondents (*n* = 52) were working in an acute hospital and 7% (*n* = 21) in a non-acute hospital/community; 8% (*n* = 26) of the respondents identified themselves as vulnerable workers, due to reasons such as a respiratory condition (35%; *n* = 9), pregnancy (23%; *n* = 6) or being immune-compromised (19%; *n* = 5) (Table 1).

### Signs and symptoms associated with physical or emotional stress

Figure 3 illustrates the frequency experienced by 275 respondents of the signs and symptoms commonly linked to physical or emotional stress. Respondents could indicate as many symptoms as applied; hence, the number of responses exceeded the *n* value. Anxiety, feelings of being overwhelmed, and mood changes were the top three commonly experienced symptoms: 48% (*n* = 132), 44% (*n* = 120), and 38% (*n* = 103), respectively (Figure 3). Table 2 details the distribution of signs and symptoms experienced based on workplaces, where a higher percentage of respondents from the telehealth group reported feeling anxious (53%; *n* = 72) and overwhelmed (48%; *n* = 66), compared to those working in acute hospital settings (41%; *n* = 21 and 47%; *n* = 24) or non-acute hospital/community settings (50%; *n* = 10 and 35%; *n* = 7) respectively.

**Table 1**

*Characteristics of Respondents*

| Characteristic (number of respondents) | | *n* (%) of responses |
|---|---|---|
| Ethnicity (multiple responses; *n* = 355) | European | 307 (86) |
| | Māori | 18 (6) |
| | Pacific Peoples | 0 (0) |
| | Asian | 16 (5) |
| | Middle Eastern/Latin American/African | 10 (3) |
| | Other Ethnicity | 2 (1) |
| | Residual Categories | 2 (1) |
| Duration of practice (*n* = 323) | > 10 years | 253 (78) |
| | 5–10 years | 30 (9) |
| | < 3 years | 19 (6) |
| | 3–5 years | 18 (6) |
| | Undergraduate student | 3 (1) |
| Highest education level (*n* = 325) | Degree | 93 (29) |
| | Postgraduate certificate | 85 (26) |
| | Postgraduate diploma | 61 (19) |
| | Master's | 53 (16) |
| | Diploma | 20 (6) |
| | PhD | 6 (3) |
| | Student physiotherapist | 5 (2) |
| Usual workplace (multiple responses; *n* = 414) | Private practice/Industries | 211 (51) |
| | Community care | 81 (20) |
| | Hospital inpatient | 48 (12) |
| | Hospital outpatient | 45 (11) |
| | Academia | 24 (6) |
| | Clinical management/Advisor | 5 (1) |
| Primary workplace during levels 3 and 4 (*n* = 312) | Telehealth | 158 (50) |
| | Acute hospital | 52 (17) |
| | Not working | 50 (16) |
| | Non-clinical work from home | 31 (10) |
| | Non-acute hospital/community | 21 (7) |
| Vulnerable status during lockdown (*n* = 318) | No | 292 (92) |
| | Yes (multiple responses) | 26 (8) |
| | Respiratory condition | 9 (35) |
| | Pregnant | 6 (23) |
| | Immunocompromised | 5 (19) |
| | I do not wish to answer | 3 (12) |
| | Cardiac condition | 2 (8) |
| | Diabetes | 1 (4) |

**Figure 3**

*Frequency of the Signs and Symptoms Experienced by Respondents (*N = *275)*

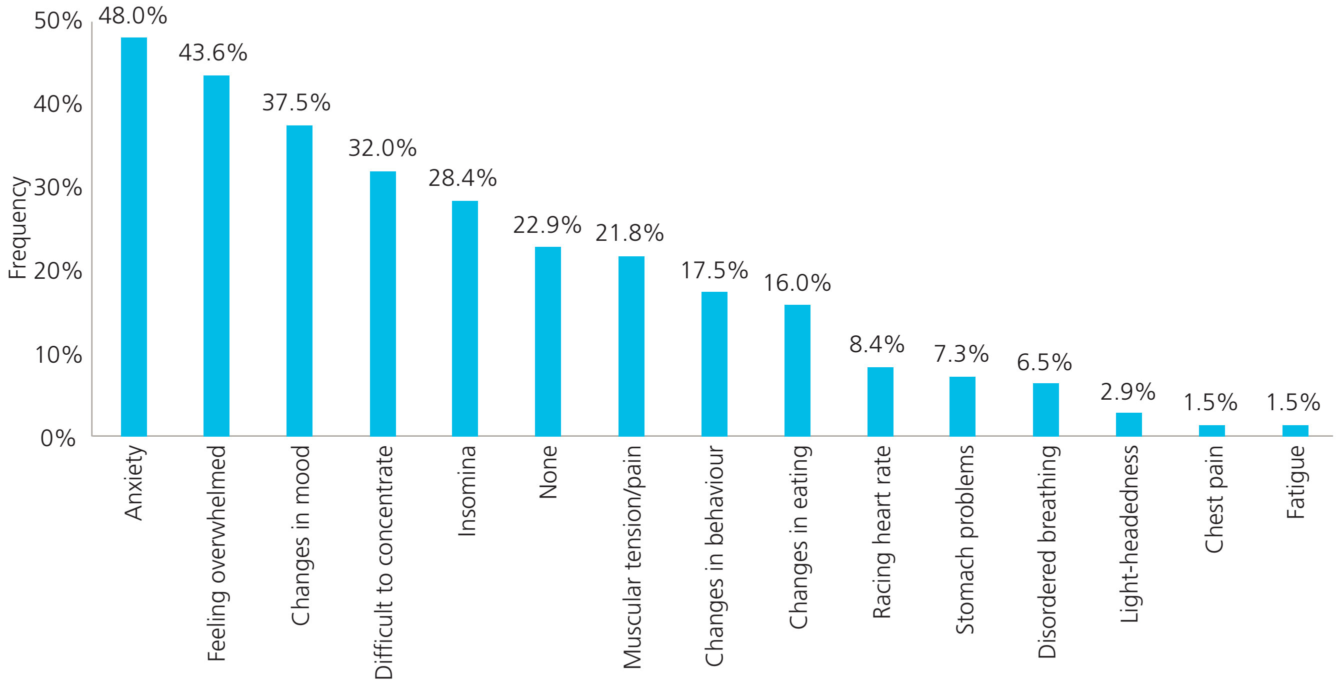


**Table 2**

*Signs and Symptoms Experienced Based on Workplaces During Alert Levels 3 and 4 (Multiple Responses)*

| Signs and symptoms | Acute hospital (51 respondents; *n* = 156 responses) | Non-acute hospital/ community (20 respondents; *n* = 48 responses) | Telehealth (137 respondents; *n* = 434 responses) | Non-clinical work from home (29 respondents; *n* = 79 responses) | Not working (38 respondents; *n* = 96 responses) |
|---|---|---|---|---|---|
| Anxiety | 21 (41) | 10 (50) | 72 (53) | 14 (48) | 15 (40) |
| Feeling overwhelmed/ forgetful | 24 (47) | 7 (35) | 66 (48) | 13 (45) | 10 (26) |
| Changes in mood | 20 (39) | 4 (20) | 54 (39) | 10 (35) | 15 (40) |
| Difficult to concentrate/ make decisions | 18 (35) | 6 (30) | 48 (35) | 7 (24) | 9 (24) |
| Insomnia | 15 (29) | 3 (15) | 46 (34) | 8 (28) | 6 (16) |
| Muscular tension/pain | 9 (18) | 2 (10) | 34 (25) | 5 (17) | 10 (26) |
| Changes in behaviour | 7 (14) | 3 (15) | 24 (18) | 7 (24) | 7 (18) |
| Changes in eating | 9 (18) | 2 (10) | 24 (18) | 5 (17) | 4 (11) |
| Racing heart rate | 4 (8) | 1 (5) | 13 (10) | 0 | 5 (13) |
| Disordered breathing | 5 (10) | 1 (5) | 10 (7) | 0 | 2 (5) |
| Stomach problems | 7 (14) | 1 (5) | 8 (6) | 3(10) | 1 (3) |
| Light-headedness | 4 (8) | 0 | 4 (3) | 0 | 0 |
| Chest pain | 0 | 0 | 2 (2) | 1 (3) | 1 (2) |
| Fatigue | 2 (4) | 0 | 2 (2) | 0 | 0 |
| None | 11 (22) | 8 (40) | 27 (20) | 6 (21) | 11 (29) |

*Note.* Data presented as n (%).

## Engagement in physiotherapy services

A sub-group of 117 respondents provided descriptions regarding the services provided at their workplace during alert levels 3 and 4. Table 3 summarises the four major themes that emerged from the analysis of the work descriptions, where respondents were either engaged, not fully engaged in their work, unable to work, or not in practice. Further analysis of comments under each major theme resulted in sub-themes being identified, where descriptors provided the reasons for the variation in types of work engagement (Table 3). (See also Appendix A, Table A3 for examples of quotes that best represent the sub-themes).

**Table 3**

*Themes and Sub-themes From Thematic Analysis*

| Themes | Engagement of physiotherapy services | | | | |
|---|---|---|---|---|---|
| | Sub-themes | | | | |
| | Acute hospital (*n* = 30) | Non-acute hospital/ community (*n* = 11) | Telehealth (*n* = 46) | Non-clinical work from home (*n* = 12) | Not working (*n* = 18) |
| Engaged (*n* = 75) | Seen as essential (*n* = 17) | Seen as essential (*n* = 9) | Sole practitioners/ contractors (*n* = 10) | Managers or leaders (*n* = 8) | – |
| | Change in role (*n* = 2) | Change in role (*n* = 2) | Change in role (*n* = 1) | Change in role (*n* = 1) | – |
| | – | – | Expected to self-manage clinical diary (*n* = 13) | – | – |
| | – | – | Regular communication (*n* = 12) | – | – |
| Not fully engaged (*n* = 24) | Not seen as essential (*n* = 6) | – | Not seen as essential (*n* = 8) | Not seen as essential (*n* = 3) | – |
| | Poor communication (*n* = 5) | – | Poor communication (*n* = 2) | – | – |
| Unable to work (*n* = 12) | – | – | – | – | Reduced clinical load (*n* = 9)<br>Lack of resources (*n* = 2)<br>Poor communication (*n* = 1) |
| Not in practice (*n* = 6) | – | – | – | – | Not practising (*n* = 4)<br>Student (*n* = 2) |
| | Education or training received at various workplaces | | | | |
| | Acute hospital (n = 33) | Non-acute hospital/ community (*n* = 7) | Telehealth (*n* = 42) | Non-clinical work from home (*n* = 11) | Not working (*n* = 16) |
| Training provided (*n* = 73) | Employer (*n* = 23) | Employer (*n* = 7) | Employer (*n* = 23) | Employer (*n* = 5) | Employer (*n* = 12) |
| | – | – | – | School of Physiotherapy (*n* = 1) | School of Physiotherapy (*n* = 2) |
| Self-directed learning (*n* = 36) | Self-initiated (*n* = 10) | – | Self-initiated (*n* = 8) | Self-initiated (*n* = 1) | Self-initiated (*n* = 1) |
| | – | – | Professional bodies (*n* = 9) | Professional bodies (*n* = 2) | Professional bodies (*n* = 1) |
| | – | – | Ministry of Health (*n* = 2) | Ministry of Health (*n* = 2) | – |

| Themes | Access to personal protective equipment | | | | |
|---|---|---|---|---|---|
| | Sub-themes | | | | |
| | Acute hospital (*n* = 31) | Non-acute hospital/ community (*n* = 12) | Telehealth (*n* = 65) | Non-clinical work from home (*n* = 13) | Not working (*n* = 18) |
| Always accessible (*n* = 91) | Readily available (*n* = 14) | Readily available (*n* = 5) | Readily available (*n* = 29) | Readily available (*n* = 7) | Readily available (*n* = 9) |
| | Initial shortage (*n* = 3) | Initial shortage (*n* = 2) | – | – | – |
| | – | – | Self-funded (*n* = 17) | Self-funded (*n* = 2) | Self-funded (*n* = 3) |
| Not always accessible (*n* = 48) | Lack of supplies (*n* = 8) | Lack of supplies (*n* = 3) | Lack of supplies (*n* = 3) | – | Lack of supplies (*n* = 2) |
| | Inappropriate fit (*n* = 4) | – | – | – | – |
| | Restricted access (*n* = 2) | Restricted access (*n* = 1) | – | – | – |
| | – | Misinformation (*n* = 1) | – | – | – |
| | – | – | Difficulty sourcing (*n* = 7) | Difficulty sourcing (*n* = 3) | Difficulty sourcing (*n* = 4) |
| | – | – | Self-funded (*n* = 9) | Self-funded (*n* = 1) | – |

Of the 117 respondents, 64% (*n* = 75) were engaged in work, while 31% (*n* = 36) were not fully engaged or unable to work due to assorted reasons categorised in Table 3. All respondents from the non-acute hospital/community and 63% (*n* = 19) of those from acute hospital settings were seen as being essential workers and had a stake in the planning of the day-to-day running of services (*n* = 9 and *n* = 17, respectively). Others at home who continued to be engaged in work were either sole practitioners or contractors (*n* = 10), clinicians who self-managed their work diaries (*n* = 13), or leaders supporting their team members (*n* = 8). For example, one respondent who was doing non-clinical work from home stated, "I manage a team of 12 … I supported them throughout lockdown" (Appendix A, Table A3). Some physiotherapists remained engaged in work but had a change in role, with 6 experiencing a shift from the outpatient setting to the acute wards or other services (Table 3). For example, a respondent in the telehealth group stated that some colleagues were "relocated towards ED", and another respondent working in an acute hospital wrote "decanting staff in the event the hospital was inundated with patients" (Appendix A, Table A3).

However, 37% (*n* = 11) of the respondents working in the acute hospital setting were not fully engaged; the reasons were that doctors and nurses saw the physiotherapists as "non-essential", despite the roles physiotherapists have in cardiopulmonary management (*n* = 6). For example, "we were represented as Allied health and so CR PHTY [cardiorespiratory physiotherapy] needs were not highlighted"; or the physiotherapists encountered poor communication with management concerning the services that should be provided (*n* = 5), e.g., "It was poor with no communication with the physio team" (Table 3; Appendix A, Table A3). Others did telehealth or non-clinical work as their usual workplace, such as in a school, was closed (*n* = 11) or they encountered a reduction in clinical load (*n* = 9), e.g., "One staff member continued to work. Two of us did not work" (Table 3; Appendix A, Table A3).

### Training or education

There were 189 physiotherapists (61% of 308 question respondents), who reported a lack of training or education in the management of patients with suspected or confirmed COVID-19. The majority of those who did not receive education were in home settings doing telehealth, non-clinical work, or not working (84%; *n* = 158), while 16% (*n* = 31) worked in healthcare facilities (acute hospital: 10%; *n* = 18; non-acute hospital/community: 7%; *n* = 13).

Among the remaining 119 respondents (39% of question respondents) who said they received education or training, 109 provided descriptions of the source and type of education/ training they received.

Table 3 summarises the themes and sub-themes that emerged from the thematic analysis: 67% (*n* = 73) of the respondents had training provided and the remaining 33% (*n* = 36) had an opportunity for self-directed learning. The majority of those working in an acute hospital (70%; *n* = 23) and all in non-acute hospital/community (100%; *n* = 7) settings were provided with education or training by their employers, while 30% (*n* = 10) from the acute hospital setting initiated their learning via online resources such as webinars (Appendix A, Table A3). For those who were at home, guidance for self-directed learning came from professional bodies such as PNZ, the Physiotherapy Board of New Zealand (total *n* = 12), and the Ministry of Health (total *n* = 4) (Table 3; Appendix A, Table A3). Topics that were commonly covered in both the acute and non-acute hospital/community settings were the use of PPE, infection control, and respiratory-related interventions (Appendix A, Table A3).

### Accessibility to PPE

Fewer than half of the 291 respondents (43%; *n* = 125) to the question regarding their accessibility to PPE said they "always" had access to the appropriate type of PPE relevant to their work. Meanwhile, 40% (*n* = 117) indicated that their accessibility to PPE was limited to "most of the time" (27%; *n* = 78), "half of the time" (4%; *n* = 12), "not very often" (5%; *n* = 15), and "never" (4%; *n* = 12).

Table 3 summarises the themes and sub-themes that emerged after analysing the descriptions from 139 respondents regarding their experiences with access to PPE. Thematic analysis of the comments resulted in accessibility being classified as "always" (65%; *n* = 91) or "not always" accessible (35%; *n* = 48) (also see Appendix A, Table A3).

While 56% (*n* = 24) of the 43 respondents working at acute and non-acute hospital/community settings reported that they "always" had accessibility to PPE, 44% (*n* = 19) encountered a lack of access due to reasons such as insufficient supplies (*n* = 11). For example, one respondent from an acute hospital setting stated, "Don't have supply of N95 masks", while another from a non-acute hospital/community setting stated that PPE "were not provided by allied health and nor were they readily available". Another example was inappropriate mask fit (*n* = 4), with one respondent stating that they "failed their N95 mask fitting tests" (Appendix A, Table A3). Other reasons included restricted access to PPE (*n* = 3), with supply "under lock and key", or misinformation (*n* = 1) where the physiotherapist stated they "were essentially told no PPE was required" (Table 3; Appendix A, Table A3). For those who were at home, comments were linked to returning to their usual workplaces at alert level 2 (Appendix A, Table A3). Within this group, PPE accessibility was limited by the difficulty in sourcing supplies (*n* = 14), e.g., "struggled to source PPE" or the need for self-funding (*n* = 10), e.g., "had to purchase own masks" (Table 3; Appendix A, Table A3).

## DISCUSSION

This survey aimed to investigate the experiences of physiotherapists during the initial response to the COVID-19 pandemic in New Zealand in March 2020. The key outcomes indicated that nearly 50% of respondents across all workplaces experienced signs and symptoms commonly linked to physical and emotional stress (Table 2); a reduced engagement in work, as other health professionals (e.g., doctors and nurses) saw them as non-essential; or encountering communication barriers with management (Table 3; Appendix A, Table A3). Not all physiotherapists were provided with education or training related to their role in the management of patients with suspected or confirmed COVID-19. Even if they did, some had to undertake self-directed learning instead of undergoing formal training provided by employers (Table 3). Furthermore, not all physiotherapists had access to appropriate PPE for their work (Table 3). These findings suggest there was a lack of pandemic readiness concerning physiotherapists in New Zealand during the initial outbreak.

The impact of pandemics on the psychological wellbeing of healthcare workers is not new knowledge, with a recent systematic review of 46 qualitative studies reporting on the negative effect of a range of pandemics on the mental health of frontline healthcare providers (Billings et al., 2021). The findings from their review included studies from Australia, Canada, Hong Kong, and South Korea, among others. Outcomes from our study in New Zealand were in line with the findings from the review, with 48% of physiotherapists saying they felt anxious and 44% felt overwhelmed (Figure 3).

In contrast to the systematic review by Billings et al. (2021), the current study found that percentages of physiotherapists using telehealth, who felt anxious and overwhelmed, showed a similar trend to the responses from those working in an acute hospital setting (53% and 48% versus 41% and 47%, respectively) (Table 2). This may suggest that physiotherapists were generally not coping well during the initial response, and, besides being involved in the direct treatment of patients with suspected or confirmed COVID-19, other factors such as stress at home may have contributed to the stress experienced. The findings may also indicate there was not enough done to support physiotherapists to prepare them at the start of the pandemic and suggest that more needs to be done to enhance the wellbeing of physiotherapists in New Zealand. Future work exploring the reasons that accounted for the stress experienced could be investigated, and potential findings could be used to propose strategies to improve the wellbeing of physiotherapists.

Globally, physiotherapy services were affected at the time of the initial outbreak of the pandemic, and continue to be negatively affected due in part to restrictions enforced on the movement of people within countries, states, or cities, resulting in the categorisation of services as "essential" or "not essential" (Prvu Bettger et al., 2020). Locally, during the initial pandemic, the only physiotherapy services considered essential were those involved in emergency and acute care to "preserve life or limb only" (Ministry of Health, 2021b, 2021c). However, 37% (*n* = 11) of respondents from the acute hospital setting were not fully engaged in work, as they were seen as non-essential by other health professionals, or faced issues with communication from management (Table 3; Appendix A, Table A3). While the categorisation of physiotherapy as an "allied health profession" may explain why others viewed physiotherapists as "non-essential", it appears to have resulted in the lack of consideration for cardiorespiratory physiotherapy (Appendix A, Table A3), which is an essential service provided in acute care (Thomas et al., 2020). Further, the lack of clear communication resulting in loss of work engagement is concerning, given that inconsistent communication could affect the sense of preparedness and ability to cope with an unfamiliar situation (Billings et al., 2021; Vindrola-Padros et al., 2020). Consequently, the findings may warrant the need for further clarification with acute hospital stakeholders and management regarding the essential role of physiotherapists, and also ensure that hospital leaders and management provide clear directions for physiotherapists, who continue to provide services during this and other pandemics.

There is strong evidence that training on the safe use of PPE and infection control during a pandemic enables health professionals to allay anxiety and execute their roles safely and with greater confidence (Billings et al., 2021). A lack of such training has been associated with feeling unprepared and an inability to deliver face-to-face healthcare services (Hoernke et al., 2021; Vindrola-Padros et al., 2020). Also, the current recommendation is that physiotherapists in acute hospitals must be trained in the safe and appropriate use of PPE, and infection prevention and control to prevent transmission of COVID-19 (Thomas et al., 2020). Despite the evidence and recommendation, outcomes from the current study continue to echo other research findings that highlight the lack of such training; even where training was provided, results from other studies showed it involved limited practical engagement (Billings et al., 2021; Vindrola-Padros et al., 2020). In the present study, 10% of the respondents from acute hospital settings and 7% from non-acute hospital/community settings did not receive any education or training, and 30% of respondents from acute hospital settings had to seek information from various external resources instead of being provided with training by their employers (Table 3).

Such findings suggest that a group of physiotherapists in acute and non-acute hospital/community settings were not adequately equipped with the knowledge to keep themselves safe, while providing physical face-to-face services during the pandemic at that time.

The fast-changing environment during the pandemic with asymptomatic cases, who may be present in unsuspecting places, coupled with physiotherapy interventions involving close contact with patients, means that physiotherapists working face to face with patients should be provided with training on aspects such as the proper use of PPE and infection control, regardless of the profile of their patients. The outcomes of this study suggest that more could have been done. In particular, leaders should have ensured they provided physiotherapists, who continued to deliver services during the pandemic in acute and non-acute hospital/community settings, with formal training to enhance their readiness. This is an essential ongoing requirement.

Accessibility to PPE has been a key concern globally in the current pandemic. Serious implications associated with limited access prompted World Physiotherapy to launch an advocacy campaign on PPE for physiotherapists (World Physiotherapy, 2021). Globally, health professionals have had inadequate access to PPE, resulting in significant fear, stress, and anxiety (Billings et al., 2021; Hoernke et al., 2021). Similarly, the outcomes from the present study indicated that physiotherapists did not always have accessibility to PPE appropriate to their work type, with only 43% indicating they “always had access”. Further, 44% of those in acute and non-acute hospital/community settings encountered barriers such as insufficient supplies, inappropriate mask fit, and restricted access (Table 3).

While the lack of supplies can be explained by the global shortage of PPE due to the sudden surge in overall demand (World Health Organization, 2020), factors such as inappropriate mask fit and restricted access were concerning, as physiotherapists work in close contact with patients or perform cardiorespiratory interventions that would require appropriate protective gear to prevent droplet or aerosols transmission (Ministry of Health, 2021a; Thomas et al., 2020; World Physiotherapy, 2020). The findings suggest the need for better clarification, particularly to medical and nursing colleagues, about the level of protection physiotherapists require to execute their role safely during a pandemic. As well, clarification on the need for physiotherapists to access PPE in acute and non-acute hospital/community settings is required for those who control access to PPE at management level.

## Implications

The outcomes of this study suggest that more work needs to be done at the managerial level to support the physiotherapy profession during a pandemic, particularly in acute and non-acute hospital/community settings where physiotherapists continue to provide physical face-to-face services. First, both workplace and personal wellbeing support should be considered in all work settings. Second, a demonstrated improvement in interprofessional practice is required, where the role of physiotherapists in acute hospitals is better understood and appreciated, to ensure that essential services such as cardiorespiratory physiotherapy continue to be delivered. Third, consistent training and education to keep physiotherapists safe needs to be ensured, particularly for those who continue to provide services in acute and non-acute hospital/community settings that operate during a pandemic. Finally, access to relevant PPE could be improved for those who continue to work in acute hospital and non-acute hospital/community settings, with a need to ensure stakeholders understand the nature of the duties and the risk physiotherapists face with COVID-19.

## Strengths and limitations

Independent parallel coding was not possible due to the design of the research project; hence, although the themes and subthemes were independently reviewed and then discussed by two authors, the interpretation may not be as robust. Second, the study is considered small in scale with an 8% response rate – reasons could include the lack of email or social media access during the period of survey dissemination or a lack of incentive for physiotherapists to participate in an eight-part survey, which may have appeared lengthy. Future studies could explore the mode of distribution that would best capture responses from a larger number of physiotherapists before dissemination, such as incentives to encourage participation or shortening the survey.

Also, the sample was primarily made up of physiotherapists with > 10 years of practice (78.3%), which means that the findings of this qualitative study may be generalised to this group of practitioners but not others. Experienced clinicians may also have a stronger perspective on the value of having their experiences surveyed and documented, acknowledging the value research brings to the profession not only to be heard, but also for future pandemic planning. The skewed response could also indicate there were more physiotherapist members of PNZ and/or the two Facebook groups, who were experienced clinicians. In addition, PNZ membership is about 75% of the approximately 5,800 physiotherapists who held an Annual Practising Certificate in New Zealand in early 2021, and those physiotherapists who work in acute hospitals are not consistently members of PNZ (Physiotherapy Board of New Zealand, 2021). Future surveys may explore other platforms to capture responses from a wider range of experiences within the profession. In consideration of the above limiting factors, the generalisability of the results from this study may be limited to the more experienced physiotherapists. Further work could be done to explore the perspectives of those whose views were not captured in this study.

Despite the limitations, the outcomes of this cross-sectional study captured a range of experiences of physiotherapists across various work settings during the initial pandemic, which provides a general perspective on the issues occurring in different areas at the time of the initial lockdown. The results also provided valuable information to justify establishing processes to enhance the professional and personal wellbeing of physiotherapists in Aotearoa New Zealand. Future research may consider methodologies that could quantify and correlate the experiences to the wellbeing of physiotherapists during the pandemic, to solidify proposals for a change.

## CONCLUSION

Physiotherapists had varying experiences in response to the initial lockdown in Aotearoa New Zealand in 2020. A key outcome of this cross-sectional study indicated that physiotherapists were going through a stressful period and may not have been ready to cope with an ongoing pandemic. While there were physiotherapists who seemed to be navigating well with adequate resources, others within the profession were not. This study has brought to light the concept that more work may need to be done to enhance the readiness and safeguard the wellbeing of physiotherapists in Aotearoa New Zealand during the ongoing pandemic.

## KEY POINTS

1. Physiotherapists in Aotearoa New Zealand may not have been coping well during the initial COVID-19 pandemic and may require further workplace and personal wellbeing support both in the early phase of this pandemic and any subsequent pandemics.
2. A better appreciation of the role of the physiotherapist in tertiary hospitals is needed through interprofessional practice to ensure their contribution is clarified and secured.
3. Consistent training and education need to be provided to all physiotherapists who continue to provide physical face-to-face services during the pandemic.
4. Further clarification with stakeholders is required regarding the PPE physiotherapists require.

## DISCLOSURES

No funding sources were used for the study. None of the authors has any conflict of interest.

## PERMISSIONS

This study was approved by the University of Otago Ethics Committee (reference number D21/054).

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## CONTRIBUTIONS OF AUTHORS

The primary author (PHG) undertook all the analysis of the data and drafting of the manuscript; all other co-authors undertook the initial development of the survey, discussion of results, contributed to the writing of the manuscript and approved the final draft.

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# Appendix A

**Table A1**

*Selected Survey Questions Used to Illustrate Their Purpose in Answering the Research Questions*

| Section | Item | Question | Purpose |
|---|---|---|---|
| 1 | 1,2,3,4,6,6a | Ethnicity, duration of physiotherapy practice, professional qualification, usual workplace(s), and vulnerability status during alert levels 3 and 4. | To explore the demographics of survey respondents. |
| 2 | 2 | Primary workplace during March–June 2020 alert levels 3 and 4. | To identify where people were working, and categorise the data set based on workplaces. |
| 2 | 3, 3a | In your primary workplace, were physiotherapists working in clinical roles included in the planning of the day-to-day running of services? Please provide a comment to your answer. | To investigate if physiotherapists were involved in the engagement of physiotherapists in work. |
| 2 | 4, 4a | Did you receive training or education on the role of physiotherapy in the management of patients with suspected or confirmed COVID-19?<br>Please describe the training or education you received. | To investigate if people were educated on their role in the management of patients with suspected or confirmed COVID-19, and what kind of training or education was provided. |
| 3 | 3, 3a | How often did you have access to appropriate PPE relevant to your type of work? Please give examples, if possible. | To investigate if physiotherapists were getting the PPE they required, and the reasons why it did not happen. |
| 4 | 7 | The following are symptoms that may be associated with physical or emotional stress. Please indicate which, if any, applied to you. | To investigate if respondents were affected physically and/or emotionally. |

*Note.* PPE = personal protective equipment.

**Table A2**

*The Six Main Workplaces*

| Main workplaces | Responses from survey |
|---|---|
| Private practice/industries | Private practice community<br>Sports centre/Gym<br>Industry/Occupational health<br>Rural practice |
| Community care | Community/District<br>Schools<br>Rest home |
| Hospital inpatient | ICU/HDU<br>ED/Admissions<br>Adult acute wards<br>Paediatric acute wards<br>Inpatient rehabilitation environment<br>Private hospital medical/surgical<br>Private hospital nonacute |
| Hospital outpatient | Outpatient department/Hospital clinic<br>Paediatrics outpatient/Community paediatrics |
| Academia | Academia/Tertiary institute – education<br>Academia/Tertiary institute – research<br>Clinical educator for students<br>Student |
| Clinical management/advisor | Clinical management/Advisor |

*Note.* ED = emergency department; HDU = high dependency unit; ICU = intensive care unit.

**Table A3**

*Examples of Quotes that Best Represent the Themes and Sub-themes*

| Themes | Engagement of physiotherapy services | | | | |
|---|---|---|---|---|---|
| | Sub-themes | | | | |
| | Acute hospital (*n* = 30) | Non-acute hospital/ community (*n* = 11) | Telehealth (*n* = 46) | Non-clinical work from home (*n* = 12) | Not working (*n* = 18) |
| Engaged (*n* = 75) | *Seen as essential (n = 17)*<br>*#181:* "Physiotherapists were consulted as part of a multidisciplinary team" | *Seen as essential (n = 9)*<br>#145: "Our role as rehabilitation therapists did not stop" | *Sole practitioners/ contractors (n = 10)*<br>#179: "I took full control of my reception as well as the clinical side of my business" | *Managers or leaders (n = 8)*<br>#176: "I manage a team of 12 … I supported them throughout lockdown" | – |
| | *Change in role (n = 2)*<br>#170: "…decanting staff in the event the hospital was inundated with patients …" | *Change in role (n = 2)*<br>#151: "I was transferred to work on inpatient wards" | *Change in role (n = 1)*<br>#273: "…some colleagues were relocated towards ED …" | *Change in role (n = 1)*<br>#63: "Organised flu vaccine for the school …" | – |
| | – | – | *Expected to self-manage clinical diary (n = 13)*<br>#73: "Physiotherapists were expected to monitor emails and Gensolve for online bookings …" | – | – |
| | – | – | *Regular communication (n = 12)*<br>#110: "Daily communication with colleagues and business owners" | – | – |

| Themes | Engagement of physiotherapy services | | | | |
|---|---|---|---|---|---|
| | Sub-themes | | | | |
| | Acute hospital (*n* = 30) | Non-acute hospital/ community (*n* = 11) | Telehealth (*n* = 46) | Non-clinical work from home (*n* = 12) | Not working (*n* = 18) |
| Not fully engaged (*n* = 24) | *Not seen as essential* (n = *6)*<br>#325: "…we were represented as allied health and so CR PHTY [cardiorespiratory physiotherapy] needs were not highlighted" | – | *Not seen as essential* (n = *8)*<br>#146: "Schools were closed, we offered teletherapy to families, most declined" | *Not seen as essential* (n = *3)*<br>#173: "School physio/ hand therapist so could not see students unless very urgent care" | – |
| | *Poor communication* (n = *5)*<br>#80: "It was poor with no communication with the physio team" | – | *Poor communication* (n = *2)*<br>#44: "Not transparent – decisions came from leadership who are not physiotherapists" | – | – |
| Unable to work (*n* = 12) | – | – | – | – | *Reduced clinical load* (n = *9)*<br>#163: "One staff member continued to work. Two of us did not work"<br>*Lack of resources* (n = *2)*<br>#189: "If Northland had better internet service/ access, I would have been able to do telehealth"<br>*Poor communication* (n = *1)*<br>#233: "We wrongly led to believe!!! … we should have been there in level 4 if needed" |
| Not in practice (*n* = 6) | – | – | – | – | *Not practising* (n = *4)*<br>*Student* (n= *2)* |

| Themes | Education or training received at various workplaces | | | | |
|---|---|---|---|---|---|
| | Sub-themes | | | | |
| | Acute hospital (*n* = 33) | Non-acute hospital/ community (*n* = 7) | Telehealth (*n* = 42) | Non-clinical work from home (*n* = 11) | Not working (*n* = 16) |
| Training provided (*n* = 73) | *Employer* (n = *23)*<br>#191: “mask fitting, proning, respiratory adjuncts, donning and doffing etc.” | *Employer* (n = *7)*<br>#103: “…staff-led inservice on resp [respiratory] physio in COVID” | *Employer* (n = *23)*<br>#98: “PPE education, hand washing review” | *Employer* (n = *5)*<br>#180: “Education sessions, resources provided, prompt sheets, flow charts etc.” | *Employer* (n = *12)*<br>#163: “Screening questions. Cleaning treatment room limiting contact time. Avoiding hands on and shared breathing space” |
| | – | – | – | *School of Physiotherapy* (n = *1)*<br>#48: “General information from School of Physiotherapy” | *School of Physiotherapy* (n = *2)*<br>#45: “…given education from Otago Physio school” |
| Self-directed learning (*n* = 36) | *Self-initiated* (n = *10)*<br>#275: “webinars and articles” | – | *Self-initiated* (n = *8)*<br>#102: “just reading on websites” | *Self-initiated* (n = *1)*<br>#61: “Bulletins and links to articles/ commentary from clinical advisors” | *Self-initiated* (n = *1)*<br>#138: “On-line reading” |
| | – | – | *Professional bodies* (n = *9)*<br>#214: “Main source of information from Ministry of Health and PBNZ and PNZ” | *Professional bodies* (n = *2*)<br>#121: “Shared resources and discussion with other physios via CRSIG” | *Professional bodies* (n = *1)*<br>#36: “board [PBNZ]” |
| | – | – | *MoH* (n = *2)*<br>#101: “Ministry of Health guidelines only” | *MoH* (n = *2)*<br>#167: “Ministry of Health procedures…” | – |

| Themes | The accessibility to PPE | | | | |
|---|---|---|---|---|---|
| | Sub-themes | | | | |
| | Acute hospital ( *n* = 31) | Non-acute hospital/ community (*n* = 12) | Telehealth (*n* = 65) | Non-clinical work from home (*n* = 13) | Not working (*n* = 18) |
| Always accessible (*n* = 91) | *Readily available* (n = *14)*<br>#282: "Never had problems accessing masks, sanitiser, gloves, face shields. Was given own goggles" | *Readily available* (n = *5)*<br>#82: "Able to access gloves, gowns and basic masks at all times…" | *Readily available* (n = *29)*<br>#89: "I have been provided with gloves, masks and hand sanitiser which I always carry" | *Readily available* (n = *7)*<br>#170: "Our clinic was closed, so we did not need PPE gear, but we had masks, gloves and gowns in storage" | *Readily available* (n = *9)*<br>#40: "As we returned to person to person contact in level 2 our only measure was masks and gloves. There was no problem with the supply of these" |
| | *Initial shortage* (n = *3)*<br>#129: "…At the beginning, there were no small N95 masks available but these became available towards the end" | *Initial shortage* (n = *2)*<br>#267: "Initially we did not have access to PPE but later on we did" | – | – | – |
| | – | – | *Self-funded* (n = *17)*<br>#265: "We didn't need this for Level 3/4 as at home but were able to get a supply of masks, gloves and face shields while in lockdown in prep for returning to clinic" | *Self-funded* (n = *2)*<br>#85: "Was able to source necessary PPE through private enterprises and contacts. No PPE obtained through the DHB or MoH" | *Self-funded* (n = *3)*<br>#141: "Purchased my own clinic supplies of PPE masks both fabric/reusable and disposable…" |
| Not always accessible (*n* = 48) | *Lack of supplies* (n = *8)*<br>#152: "Don't have supply of N95 masks…" | *Lack of supplies* (n = *3)*<br>#287: "They were not provided by allied health and nor were they readily available on the wards I worked on" | *Lack of resources or supplies* *(n = 3)*<br>#281: "We were stopped from seeing clients … because there was insufficient PPE" | – | *Lack of supplies* (n = *2)*<br>#182: "Disinfectant ran out in one hospital to wash hands" |

| | | | | | |
|---|---|---|---|---|---|
| | *Inappropriate fit* (n = *4)*<br>#70: "…most workers in the hospital failed their N95 mask fitting tests and they had no alternatives to provide us with…" | – | – | – | – |
| | *Restricted access* (n = *2)*<br>#325: "…it was a terrible time where we needed to campaign hard to educate anyone who would listen about how we perform our duties and where we needed protection…" | *Restricted access* (n = *1)*<br>#212: "In the early days the supply was under lock and key" | – | – | – |
| | – | *Misinformation* (n = *1)*<br>#151: "We were essentially told no PPE was required…" | – | – | – |
| | – | – | *Difficulty sourcing* (n = *7)*<br>#73: "…there was a huge wait for masks and gloves when we returned to work" | *Difficulty sourcing* (n = *3)*<br>#117: "At one point it was not possible to order facemasks or hand sanitiser" | *Difficulty sourcing* (n = *4)*<br>#268: "The clinic owner struggled to source PPE" |
| | – | – | *Self-funded* (n = *9)*<br>#75: "contractor in community and no PPE provided – had to purchase own masks" | *Self-funded* (n = *1)*<br>#94: "…some requested we bring our own as contractors" | – |

*Note*. CRSIG = Cardiorespiratory Special Interest Group [of Physiotherapy New Zealand]; DHB = District Health Board; MoH = Ministry of Health; PBNZ = Physiotherapy Board of New Zealand; PNZ = Physiotherapy New Zealand; PPE = personal protective equipment.

# Uo mo aso uma, a o uso mo aso vale: Lessons from Aotearoa Physiotherapists Responding to Disasters within the Pacific

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## ABSTRACT

Disasters can have sudden and devastating impacts on the health systems in the Pacific region, many parts of which are in a precarious state. The region is increasingly recognised as being prone to disasters such as those caused by climate change or epidemics. Physiotherapists have been identified as vital members of the interprofessional health team that responds to such catastrophic events. Despite this, in the Pacific region little is known about the nature of physiotherapists' involvement and the multifaceted roles physiotherapists play in responding to disasters. This clinical commentary contains 1) an evaluation of the relevant literature sourced to describe the current knowledge base; and 2) a commentary on the experiences gained from physiotherapists' response to the Samoa measles outbreak in 2019. Outcomes from the commentary have formed the basis of recommendations for the role the physiotherapy profession in Aotearoa New Zealand could have in responding to future potential disasters in the wider Pacific region.

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Key Words: Disaster, Measles, Pacific, Physiotherapist, Samoa

## INTRODUCTION

The United Nations Office for Disaster Risk Reduction (UNDRR) defines a disaster as "a serious disruption of functioning of a community or a society causing widespread human, material, economic or environmental losses, which exceeds its ability to cope using its own resources" (United Nations, 2009). This definition encompasses any cause of a disaster, whether it be through natural causes such as earthquakes, floods, and volcanic eruptions or man-made causes such as acts of violence or pandemics of transmittable diseases, such as the SARS-CoV-2 virus (COVID-19) that is currently impacting the world. UNDRR's definition of disaster mandates the involvement of local and international health professionals in providing humanitarian assistance during periods of societal disruption.

Since World War I, physiotherapists have played a critical role in providing physical rehabilitation during global conflicts and disasters, and were focused initially on the provision of physiotherapy on an individual level (Linker, 2005). The role of physiotherapists in disasters has evolved and expanded immensely since the early 1900s and now incorporates the planning and provision of skilled services at an individual, community, and governmental level (Lathia et al., 2020). The professional enactment of this role has conversely shaped the profession itself and positioned physiotherapists "the primary providers of orthodox physical rehabilitation" (Nicholls, 2017, p. 3).

Physiotherapists continue to be involved in humanitarian support efforts in response to disasters through multiple avenues, including non-governmental organisations such as the International Committee of the Red Cross and governmental bodies such as emergency medical teams. There is a growing awareness, both within and beyond the profession, of the multidimensional and essential roles physiotherapists perform before, during, and long after disasters. From within the profession, these roles have been mandated by World Physiotherapy (World Physiotherapy, 2019) and have been echoed and strengthened within the region by the Asia-Western Pacific (AWP) regional organisation of World Physiotherapy (Skinner, 2006).

### Regional context: The relationship between Aotearoa New Zealand and the Pacific

Aotearoa New Zealand has a historical and enduring cultural and political connection to the wider Pacific region. Pacific peoples come from the 22 Pacific Island countries and territories and comprise distinct populations with diverse political structures, socioeconomic status, language, and cultures spanned across the largest ocean in the world. The Pacific Island countries and territories, excluding Australia and Aotearoa New Zealand, comprise almost 13.6 million people (United Nations, 2022). There are also approximately 382,000 people who identify as Pacific living in Aotearoa New Zealand (Ministry for Pacific Peoples, 2020). Thus, Aotearoa New Zealand is geographically a Pacific nation, as are its territories Tokelau and the Ross Dependency, and the self-governing associated states of the Cook Islands and Niue. The association with Pacific peoples dates back to the earliest settlement of Aotearoa New

Zealand by Polynesians, who were the inventive sea-faring ancestors of the Māori, the Indigenous people of Aotearoa New Zealand (Ministry for Culture and Heritage, 2021). This history reveals a shared genealogy between Māori and Pacific peoples (Salesa, 2017). The country's political history in the Pacific links to Aotearoa New Zealand's administration of some of the Pacific islands (Ministry for Culture and Heritage, 2020). These diplomatic relationships have endured as exemplified in Aotearoa New Zealand's Treaty of Friendship with Samoa signed in 1962 (New Zealand Ministry of Foreign Affairs and Trade, 1962).

In general, Pacific peoples in Aotearoa New Zealand continue to maintain strong social, spiritual, and familial links to their Pacific Island countries of heritage. Pacific peoples in Aotearoa New Zealand traditionally support family in the Pacific Islands through the sending of remittances and other material donations, as well as through accommodating and assisting with the settlement of new arrivals from the Pacific (Schanzel et al., 2014; Enari & Viliamu Jameson, 2021). The increasingly significant size of the Pacific population in Aotearoa New Zealand, the shared history between Aotearoa New Zealand and the Pacific Islands, and the ongoing sense of responsibility to the Pacific region, mean that the health and wellbeing of Aotearoa New Zealand will always be linked to the health status of Pacific peoples (New Zealand College of Public Health Medicine, 2019). This is particularly true in the city of Tāmaki Makaurau/Auckland, a city that hosts over 63% of the country's Pacific population (Ministry for Pacific Peoples, 2020).

Over 180,000 of these Pacific people identify as being Samoan, making this group the single largest subgroup of Pacific peoples living in Aotearoa New Zealand (Stats New Zealand, 2018). This group is estimated to grow to between 220,000 to 240,000 by 2025 (Ministry for Pacific Peoples, 2020). Despite the majority (66%) of the Pacific population being born in Aotearoa New Zealand (Ministry of Health, 2020), enduring cultural values remain shared among Pacific groups. These values include the importance of family, collectivism and communitarianism, spirituality, reciprocity, and respect (Ministry of Health, 2020). In the Samoan context, these values underpin the phenomenon that is known as *fa'asamoa* – the defining rituals, practices, and attitudes of Samoan culture, and include the foundational values of *fa'aaloalo* (humility) and *alofa* (love) (Ioane & Tudor, 2017).

Weaving these cultural contexts, world views, and understandings of holistic health and wellbeing (all of which are tightly linked to family, community, and the environment) into the delivery of health services is recognised to be fundamental to quality care for Pacific peoples (Ministry of Health, 2008). It is also recognised that a culturally responsive workforce will have a greater ability to meet Pacific peoples' needs and improve health outcomes by translating cultural practices, concepts, and diverse world views into high-quality, evidence-informed health services (Pacific Perspectives Limited, 2019). A culturally responsive health workforce that delivers high-quality health services during a period of societal crisis elicits the Samoan saying: "O uo mo aso uma, a o uso mo aso vale", which translates to "friends for all seasons and kin in moments of crisis" (Efi, 2007). Such responses are of particular importance for the physiotherapy profession to take note of as only 1% of registered physiotherapists identifies as being Pacific (Physiotherapy Board of New Zealand, 2022). Furthermore, the sense of kinship described above affirms the United Nations Universal Declaration of Human Rights Article 1 to "act towards one another in a spirit of brotherhood" (United Nations, 1948) and provides the overarching theme for this commentary.

The literature reviewed in this commentary was instigated by the primary author's (LOS) involvement in an emergency medical team during the measles epidemic in Samoa in 2019. An exploration of the links in the publications between the physiotherapy profession in Aotearoa New Zealand and its involvement in responding to disasters within the Pacific region was then undertaken.

The aims of this clinical commentary were 1) to review the published literature supporting the role of physiotherapists in disasters, with a particular emphasis on their role within the Pacific region; and 2) to identify the roles of Aotearoa New Zealand-based physiotherapists in the management of disasters that have occurred within the Pacific region, utilising the response to the 2019–2020 measles epidemic in Samoa as a case example. The key outcome intended was to highlight potential opportunities Aotearoa New Zealand-based physiotherapists have in responding to and participating in disaster responses within the wider Pacific region.

## METHODS

Articles for review were sourced through an electronic search of the following databases: MedLine, PubMed, Scopus, Web of Science, CINAHL, and Cochrane Library. Search terms included "disaster", "hurricane", "tsunami", "earthquake", "flood", "pacific", "oceania", "physiotherap*", "physical therap*", and "rehabilitation". Articles were restricted to those published since 2010 and written in the English language. Abstracts were read by LOS to determine appropriateness and the references of included articles were searched for other relevant articles. Searches of the grey literature were employed to locate other articles, reports, policies, and guidelines through search engine websites such as Google.

## FINDINGS

### History of physiotherapists' involvement in disaster management

Findings from the literature searched indicated there was a growing consensus around the indispensable roles physiotherapists play as the principal provider of physical rehabilitation. These roles span the entire "disaster continuum", from preparation to response and on to recovery, and have been recognised through a comprehensive report entitled "The role of physical therapists in disaster management" (World Confederation of Physical Therapy [WCPT] 2016). In the report, the WCPT, now known as World Physiotherapy, detailed the role of the physiotherapist at each phase along the disaster continuum, as outlined in Table 1.

In the *response* phase of a disaster, intervention by the physiotherapist is required as early as possible. Lathia and colleagues (2020) noted that the "early rehabilitation of traumatic injuries is a crucial element of the acute medical

**Table 1**

*Roles of Physiotherapists Preparing for Disasters*

| Physiotherapists' roles |
|---|
| 1. Increasing their awareness of the likely consequences of disasters – in terms of impact on services and infrastructure, injuries, disease, psychological impacts, and social impacts. |
| 2. Lobbying governments and non-governmental organisations and institutions to be prepared for disasters and to include physical therapists in their planning. |
| 3. Playing a lead role in advocating for and ensuring the inclusion of all vulnerable groups in emergency preparedness. |
| 4. Contributing to disaster risk reduction efforts and reducing the vulnerability of populations by providing effective development programmes. |

*Note.* Adapted from "The role of physical therapists in disaster management" (WCPT, 2016, p. 21).

response" (p. 2). Global health authorities, including the World Health Organization (WHO), continue to emphasise that medical rehabilitation should be initiated acutely during the emergency disaster response and should be continued in the community over a longer term (Kahn et al., 2019).

In its report on disaster management, the WCPT outlined the skills commonly required by the physiotherapist to be included in the rehabilitation of people with the following conditions: fractures, spinal cord injury, amputation, brain injury, burns, soft tissue injury, and nerve injury; and stated that respiratory management is likely to be required for people in disasters involving tsunami or floods (WCPT, 2016). The role of the physiotherapist is not limited only to the direct provision of rehabilitation following a diaster but can also include assessment, coordination, psycho-social support, and advocacy. As noted by Nixon and colleagues (2010) following the Haiti earthquakes in 2010, physiotherapists often operate in communities with poor resources, limited health infrastructure, and at times no local rehabilitation profession. Thus, strong clinical expertise, communication, coordination, leadership, and collaboration skills have been identified to be essential competencies for physiotherapists operating in disaster settings during the response phase (Cassady et al., 2014; Nepal Physiotherapy Association, 2015).

Importantly, the WCPT (2016), acknowledges that rehabilitation in humanitarian disasters is best provided by experienced local providers. Local providers have an understanding of the cultural-political history that has led to the current health system, are readily able to navigate this system during disaster responses, and can communicate effectively with other health care workers and patients during periods of societal distress. An interesting qualitative study by Canadian physiotherapists who had worked in foreign resource-poor countries highlighted the importance of being aware of subjects that are relevant to global health, as well as being adept at managing challenges to communication, such as differences in language, by using translators, utilising non-verbal techniques, and learning the local language (Cassady et. al., 2014).

For the *recovery* phase, WCPT (2016) recognises that physiotherapists form a key link between disaster response and recovery, and should play a role in rehabilitation capacity building, as well as planning of service delivery, accessibility, and inclusion. This involves providing professional skill development opportunities for local services on topics where a learning need has been identified, with the aim to "build back better" (World Physiotherapy, 2016, p. 6). Again, the importance of locally led recovery initiatives is encouraged in order to serve the long-term health outcomes of the local people.

Beyond the profession, other organisations such as the International Committee of the Red Cross have also acknowledged both the general and specialised skill sets of physiotherapists in providing rehabilitation. These organisations have ensured that rehabilitation is a required component of "medical" responses to disasters (United Nations, 2009; Skelton & Harvey, 2015; Sphere Association, 2018; International Committee of the Red Cross, 2022). They have also ensured that physiotherapists are integrated as essential team members in specially trained emergency medical teams, who provide international humanitarian medical support on behalf of foreign governments (Skelton & Harvey, 2015; World Health Organization, 2016; Sphere Association, 2018; Ministry of Health, 2021; World Health Organization, 2021). Physiotherapists have also been recognised as being able to optimise positive post-surgical outcomes as part of best practice recommendations for surgical responses in disasters (Chackungal et al., 2011). This ability was aligned with a growing awareness that improvements in international medical responses led to a reduction in mortality following a disaster with a consequent increase in impairment and rehabilitation needs (Landry et al., 2010; Khan et al., 2015; Sheppard & Landry, 2016).

The vast skill set physiotherapists have extends beyond conventional roles in managing the victims of a disaster to include the provision of physiotherapy services to fellow disaster response workers, as well as education and professional development opportunities for local health professional staff, as noted during the 2015 earthquakes in Nepal (Nepal Physiotherapy Association, 2015). Additionally, a patient-centred and collaborative approach is important, through attentive listening to the patients' experiences and working with colleagues to ensure a high level of psychological support is available for patients, as observed during the 2011 Christchurch earthquakes (Mulligan et al., 2015).

### Role of physiotherapists in disasters in the Pacific region

Little has been specifically documented around the role of physiotherapists in disaster responses in the Pacific region, despite the recognised increasing frequency and impact of natural disasters (Enari & Viliamu Jameson, 2021) and infectious disease epidemics (Mishra et al., 2007; Morand et al., 2014). Examples of recent disasters in the region include the 2009 tsunami in Samoa (Leong-Newell et al., 2012); 2011 Christchurch earthquakes (Ardagh et al., 2012; Mulligan et al., 2015); 2019 measles epidemic in Samoa (Isaacs, 2020; Thornton, 2020); 2019 eruption of Whakaari/White Island (Cuthberson et al., 2020); and the Hunga Tonga-Hunga Ha'apai eruption in December 2021 (Burki, 2022).

As summarised in Table 2, of the five disasters listed above that have occured in the region in the past 13 years, 12 articles describing the rehabilitative response to the disaster have been published. However, when reviewed more closely, only three of the 12 articles mentioned physiotherapy specifically. One article was a reflection on the need for respiratory physiotherapy following the 2009 tsunami in Samoa (Leong-Newell et al., 2012); the second was an insightful qualitative study about local physiotherapists who were involved with rehabilitation efforts during and after the Christchurch earthquakes (Mulligan et al., 2015); and the third was an article that only briefly mentioned the assistance given by physiotherapists at the National Burns Centre following the Whakaari/White Island eruption (Baker et al., 2021).

### A Pacific case: Samoa measles epidemic and the Samoan Physiotherapists' Network

In recent years, Samoa has been experiencing declining measles, mumps, and rubella (MMR) immunisation rates. By 2018 the rates had dropped to 28% of infants having received their second MMR dose down from 77% recorded in 2017 (Dyer, 2019). These rates were well below the WHO's target of 95% coverage required to attain herd immunity (Health Navigator, 2022) at the onset of the measles outbreak in 2019. This fall in vaccination rate was contrary to the WHO's efforts towards "measles elimination" (World Health Organization, 2015, p. 2) but reflected the global trend of measles vaccine coverage plateauing coupled with subsequent outbreaks (MacDonald et al., 2020). This decline in vaccination rate was compounded by a period of suspension of the national MMR immunisation programme following two paediatric deaths as a result of the babies mistakenly being injected with muscle relaxants rather than the MMR vaccinations (Dyer, 2019; Jackson & Lyons, 2019; Thornton, 2020). An immediate recall of all MMR vaccines was ordered following these deaths, in the period July 2018 through to April 2019. This series of events created public mistrust surrounding vaccinations (Hooper, 2020). The risk of obtaining the virus was heightened by such factors as unrestricted travel between Samoa and other measles-affected countries (Craig, Heywood, & Worth, 2020). These elements set the scene for the widespread measles outbreak that occured in Samoa in 2019 after the virus was transferred by a single passenger from Aotearoa New Zealand (Isaacs, 2020; Kaspar et al., 2020).

The subsequent measles epidemic that occurred in Samoa caused a state of emergency to be declared on 15 November 2019, which was withdrawn towards the end of December 2019. It infected over 5,700 Samoans (up to 3% of the population) and claimed 83 lives (Macintyre et al., 2020; World Health Organization, 2020). The majority (87%) of these fatalities were children under the age of four years (Craig, Heywood, & Worth, 2020; Duckor-Jones, 2020). The mortalities were attributed to secondary complications from

**Table 2**

*Summary of Articles Published on Disasters*

| Reference(s) | Disaster event | Country | Year | Relevance to physiotherapy |
|---|---|---|---|---|
| Leong-Newell et al. (2012) [a] | Tsunami | Samoa | 2009 | Need for respiratory physiotherapy. |
| Ardagh et al. (2012)<br>Goldstraw et al. (2012)<br>Mulligan et al. (2015) [a]<br>Nunnerley et al. (2015) | Earthquakes | Aotearoa New Zealand (Christchurch) | 2011 | Role of physiotherapy in psychosocial support.<br>Role of physiotherapy in rehabilitation for older adults. |
| Cuthberson et al. (2020)<br>Baker et al. (2021) [a] | Volcanic eruption | Aotearoa New Zealand (Whakaari/White Island) | 2019 | Mention the assistance of physiotherapists working at the National Burns Centre during the response. No detail on what that assistance entailed. |
| Craig et al. (2020)<br>Isaacs (2020)<br>Schnirring (2019)<br>Thornton (2020) | Measles outbreak | Samoa | 2020 | No mention of physiotherapy or rehabilitation. |
| Burki (2022) | Volcanic eruption | Tonga | 2021 | No mention of physiotherapy or rehabilitation. |

*Note.* This table summarises articles published on disasters that have occurred in the Pacific region since 2009, including those that outline the relevance of physiotherapy input and reference the physiotherapists' contribution(s).

[a] Articles specifically refer to physiotherapist involvement.

the measles infections such as pneumonia and multi-organ failure, rather than the measles infections themselves. During this outbreak, the Samoan Prime Minister requested the assistance of Samoan health professionals living in Aotearoa New Zealand and Australia to support the overwhelmed local health service (New Zealand Ministry of Foreign Affairs and Trade, 2019). The manager of allied health in Samoa, who was also a physiotherapist by profession, reported at the time that the Samoan service was already receiving some support from physiotherapists who were part of emergency medical teams from the United Kingdom, Israel, and Japan. The manager made a strong request for additional support from Aotearoa New Zealand-based physiotherapists, in particular those with experience in acute respiratory management and paediatrics, as well as a conversational level of Samoan language ability. At the end of one of the manager's early emails in her call for help she wrote, "Malo lava fa'afetai le loto nuu, manaomia lava outou e Samoa!!", meaning "Thank you for your heart for our country, Samoa desperately needs you!!" (E. Pouesi-Young, personal communication, December 17, 2019).

In response to this call, the primary author (LOS) contacted Aotearoa New Zealand-based physiotherapists of Samoan descent and established the Samoan Physiotherapists' Network (SPN). Subsequently, three physiotherapists from within the network offered to volunteer their clinical and professional services in Samoa between December 2019 and March 2020.

The SPN received generous funding support through donations from individuals, student groups, church groups, and Pacific Island Community Trusts, as well as secretariat support from the office of the Associate Dean (Pacific) of Health Sciences at the University of Otago, Professor Faumuina Fa'afetai Sopoaga. Professor Sopoaga led a medical response team of Samoan physicians based in Aotearoa New Zealand (University of Otago, 2019) and encouraged the primary author in his co-ordination of the SPN (F. Sopoaga, personal communication, December 17, 2019). This support enabled the SPN to liaise with the Samoan health registering body to secure temporary practising certificates, which subsequently resulted in the deployment to Samoa at the end of 2019 three Aotearoa New Zealand registered physiotherapists spanning a period of three and a half weeks in total. These three physiotherapists worked alongside the international emergency medical teams on a rostered basis to provide respiratory assessments and treatments for patients needing acute management in the intensive care unit, and paediatric and adult wards, as well as musculoskeletal and neurological rehabilitation in the outpatient department at Tupua Tamasese Meaole II Hospital in Moto'otua, Apia, the capital of Samoa. The SPN physiotherapists were very well received and there were many highlights including the camaraderie established among local and overseas staff; provision of professional development sessions to the local Samoan team of physiotherapists and wider allied health staff; and the emotional contribution from being able to relieve local physiotherapists of their duties so they could celebrate the New Year's holidays with their families. The two local physiotherapists reported that these were their first days they had had off work in eight weeks.

## DISCUSSION

### Learnings and clinical implications from the Samoan measles response

There are several relevant reflections that arose as a consequence of being involved in providing services during the Samoa measles epidemic. First, it is clear that Aotearoa New Zealand-based physiotherapists can have an important role in helping Pacific neighbours. The SPN physiotherapists provided an ideal solution to the acute health workforce needs during the disaster response and recovery phases. In Aotearoa New Zealand there is a pool of around 6,000 registered, practising physiotherapists who are "experienced local providers" (Physiotherapy Board of New Zealand, 2022), who could be contacted to provide a neighbouring workforce solution in the Pacific in response to a potential future disaster. Physiotherapists who may volunteer could be mobilised swiftly and relatively inexpensively.

Second, the expectations of Aotearoa New Zealand-based physiotherapists to demonstrate reflective competence in their understanding of the principles of Te Tiriti o Waitangi (Physiotherapy Board of New Zealand, 2018b), as well as the likely familiarity in working with Pacific peoples living in Aotearoa New Zealand, further enriches Aotearoa New Zealand-based physiotherapists with nuanced cultural and communication skills when working with Pacific peoples in times of heightened anxiety, such as within disaster settings. As noted by the Samoan manager of allied health, it was these culturally responsive skills coupled with the relevant clinical expertise that were desperately needed during the measles epidemic. As demonstrated by the SPN, Pacific physiotherapists living in Aotearoa New Zealand who have a command of their native languages could and should play a leading role in future disaster management efforts in the Pacific.

The SPN physiotherapists successfully demonstrated the critical role physiotherapists have in the acute phase of a disaster response, in particular during the measles outbreak, in the acute management of both paediatric and adult cases with respiratory conditions that were secondary complications of the measles. Physiotherapists also have an important role in preparing patients for discharge from the hospital back into the community and in ongoing community rehabilitation (WCPT 2016; Kahn et al., 2019).

WCPT (2016) encourages physiotherapists from any location in the world who have an interest in providing humanitarian support to indicate their interest through direct contact with a local aid agency. For Aotearoa New Zealand-based physiotherapists, this could involve applying to the New Zealand Medical Assistance Team (NZMAT) or the Pacific Medical Assistance Team (PACMAT) (Pasifika Medical Association, 2020). The NZMAT team is coordinated by the Ministry of Health and is deployed by the Ministry of Foreign Affairs and Trade to assist with disaster responses in the Pacific region. Potential benefits from working within the NZMAT include providing rehabilitation within a co-ordinated team with pre-determined reporting lines, receiving specialised training, and entering into an agreement with the therapists' employer to ensure NZMAT deployments are paid at the standard working hourly rate (Ministry of Health, 2021; New Zealand Medical Assistance Team, 2021). The paid deployment could be an attractive option for members of the SPN and other volunteer groups, as the SPN members who volunteered in the Samoan measles response used annual leave from their employment to provide this vital humanitarian support. In a similar way, PACMAT also coordinates and deploys emergency medical teams during disasters within the Pacific region, though this is coordinated by the Pasifika Medical Association in consultation with the Ministry of Foreign Affairs and Trade (Pasifika Medical Association, 2020).

Physiotherapists have a role in disseminating and promoting public health messages (Cassady et al., 2014; Physiotherapy Board of New Zealand, 2018b). This is of particular importance during pandemics or disasters as a consequence of transmittable diseases, such as in the measles outbreak in Samoa. In the latter event, health education included providing advice to parents about the urgency of seeking medical attention if children were demonstrating symptoms; providing education on the efficacy of vaccinations for measles and other transmittable illnesses; and providing reassurance and education on the benefit of hospital-level care alongside traditional healing practices.

### Professional capacity-building implications

There is great potential and scope for physiotherapists in Aotearoa New Zealand to work more closely with and build the capacity of physiotherapy services in the Pacific. In the future, this could encompass things such as providing locum clinical cover; sharing expertise and professional development opportunities that focus on developing local skill capacity and service planning in the Pacific; and strongly advocating potential benefits for Pacific people to governments and funding bodies in order to resource such services. Recent advances in digital technologies could further facilitate these initiatives. Strength and support for such initiatives to benefit our Pacific neighbours should be promoted by Physiotherapy New Zealand, the voice of the physiotherapy profession in Aotearoa New Zealand and member organisation of the AWP region of World Physiotherapy (Skinner, 2006).

In 2021 the Pasifika Physiotherapists' Association was reestablished and the SPN group merged with it. This group of Aotearoa New Zealand-based physiotherapists of Pacific descent could play a leading role in establishing formal relationships with physiotherapy services in the Pacific, to provide culturally nuanced expertise in co-developing tailored disaster readiness plans in local languages and by building local skill capacity. There may also be a role in advocating for innovative solutions not only in the initial response phase but also in the provision of medium- to long-term rehabilitation following a disaster. This would help ensure health gains established in the response phase are sustained and meaningfully translated into the resumption of family and community roles.

### Clinical implications

There is little documentation on or published accounts of the involvement of physiotherapists in the provision of health services surrounding disasters in the Pacific region. Of the literature searched within the past 13 years, only three published articles had a specific reference to physiotherapy in disaster management within the Pacific region. However, it is widely accepted that physiotherapists are integral members of interdisciplinary health teams that respond to disasters. A recent local example was following the 2019 eruption of Whakaari/White island volcano, where physiotherapists across Aotearoa New Zealand were actively involved in the acute and long-term rehabilitation of people injured in this disaster. Yet, to date, only one article made mention of the physiotherapists' contribution in the following brief acknowledgement: "Additionally, we received allied health assistance for occupational therapy and physiotherapy. We were exceedingly grateful to receive so many offers of assistance and would have struggled to manage the huge workload without our friends and colleagues help" (Baker et al., 2021, p. 8). This disparity between the active clinical response during the disaster and the published account of physiotherapists' contributions highlights the gap in recognition of physiotherapists alongside the importance of documenting such clinical experiences in order to benefit the ongoing learning of the local, regional, and global profession.

There is potential for the development of a working group or subgroup associated with PNZ that focuses on disaster management policies, procedures, and initiatives. Potential aims for such a group could be to: 1) create a network of those with interests in providing their skills and expertise to contribute to disaster management activities in the Pacific region; 2) increase the awareness of a range of recognised pathways that may lead to involvement in disaster responses; and 3) promote more publications around the contributions of Aotearoa New Zealand-based physiotherapists in disaster settings in the Pacific region.

### COVID-19

Besides the measles epidemic in Samoa, the current COVID-19 pandemic has reiterated the precarious status of the health systems in the Pacific (Craig, Heywood, & Hall, 2020). For Samoa, this is particularly concerning as it is well known that non-communicable diseases are prevalent – one in four adults has Type II diabetes mellitus and over half of the adult population is obese (Lin et al., 2016) – placing the nation at disproportionately higher risk of mortality associated with comorbidities. It is for this reason that the Samoan government was among the first to close its borders to international travel following announcement of the global pandemic in 2020 (Thornton, 2020). COVID-19 thus remains a serious risk to the health and wellbeing for people living in the Pacific islands. This risk further highlights the imminent importance of Aotearoa New Zealand-based health professionals being prepared to provide clinical support within the region by enlisting with local emergency response teams using the NZMAT and PACMAT application processes (Pasifika Medical Association, 2020; Ministry of Health, 2021; New Zealand Medical Assistance Team, 2021).

## CONCLUSION

The physiotherapy profession would benefit from more information on the experiences of physiotherapists who have contributed to disaster management and/or are actively participating in disaster responses within the Pacific region. Such examples would provide contextual insight into the opportunities, barriers, and challenges surrounding the provision of support from physiotherapists during and after disasters.

The information would also enable physiotherapists to learn more about the value of contributing to disaster management, irrespective of their clinical area(s) of expertise. A key feature of all disaster management is to work with the local community and this highlights the unique importance of the physiotherapist demonstrating cultural knowledge and culturally safe skills in working alongside people of the Pacific region. Such knowledge strengthens physiotherapists' ability to perform their critical and multifactorial roles in disaster responses and long-term recovery (International Federation of Red Cross and Red Cross Societies, 2012; Cassady et al., 2014; Skelton & Harvey, 2015; Physiotherapy Board of New Zealand, 2018a).

In Samoa there is a saying: "O uo mo aso uma, a o uso mo aso vale", which means "friends for all seasons and kin in moments of crisis" (Efi, 2007). It is this sense of kinship in the midst of profound hardship that has been repeatedly demonstrated by the physiotherapy profession since the early 1900s, and the same sense that was shared during the Samoa measles epidemic of 2019–2020 among Samoan physiotherapists based in Aotearoa New Zealand. This sense of connection should also guide the efforts of physiotherapy colleagues in actual and potential disaster responses within the Pacific region in the future.

## KEY POINTS

1. Physiotherapists play vital and multifaceted roles in disaster planning, response, and recovery.
2. Physiotherapists in Aotearoa New Zealand provide a skilled and equipped workforce that could respond to disasters in the Pacific region swiftly and appropriately.
3. Physiotherapists of Pacific descent should play a leading role in coordinating and delivering physiotherapy responses to disasters in the Pacific region.
4. Involvement of physiotherapists in disasters should be documented in order to promote and further inform physiotherapists about disaster management and clinical responses.

## DISCLOSURES

No funding was received for this project. LOS is the current Chair of the Pasifika Physiotherapists Association Inc. and coordinated the Samoa Physiotherapists' Network as described in the manuscript. The authors are not aware of other conflicts of interest related to this article.

## PERMISSIONS

None.

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## CONTRIBUTIONS OF AUTHORS

The primary author (LOS) undertook all the analysis of the data and drafting of the manuscript. The secondary author provided advice during the initial development of the manuscript, contributed to the writing of the manuscript and approved the final draft.

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# PHYSIOTHERAPY CONFERENCE 2022

## CONFERENCE ABSTRACTS

PHYSIOTHERAPY
NEW ZEALAND
*Kōmiri Aotearoa*

NZJP

**Abstracts from the Physiotherapy New Zealand Conference 2022, held in Rotorua, New Zealand, from September 8–11, 2022 [https://doi.org.10.15619/NZJP/50.3.07]**

Peer-reviewed abstracts are listed in order by first-named author under the following categories – classic, rapid 5, focussed symposium and fishbowl. The presenting author's name(s) is underlined.

# Classic Abstracts

## MANAGEMENT OF WOMEN WITH PREGNANCY-RELATED PELVIC GIRDLE PAIN: AN INTERNATIONAL DELPHI STUDY

**Aldabe, D[1]., Lawrenson, P[2]., Sullivan, S. J[1]., Hyland, G[1]., Bussey, D. M[1]., Hammer, N[3]., Bryant, K[1]., & Woodley, S[1].**

[1]*University of Otago;* [2]*University of Queensland, Australia;* [3]*University of Graz, Austria*

**Background:** Pregnancy-related pelvic girdle pain (PPGP) affects a third of women during pregnancy and postpartum, negatively impacting their activity and participation. Clinical guidelines suggest a variety of conservative treatments with limited effectiveness. Additionally, the management of this condition varies among clinicians and between countries.

**Purpose:** This study aimed to reach a consensus on the essential elements of PPGP management through an international Delphi study involving women's health experts.

**Methods:** Eighty-seven international experts in the field of PPGP were invited to participate, and surveyed over three rounds. In Round 1 of the survey, open-ended questions were used to obtain feedback on 16 components of PPGP management previously identified by a focus group. Panel member feedback guided modification and refinement of questions for Rounds 2 and 3. A 5-point Likert scale was used to rate level of agreement, with a minimum threshold for consensus of ≥ 75% agreement set across all rounds of the survey.

**Results:** The response rate for participation in the panel was 50% (44/87), with 77% (34/44) of panellists contributing to all three rounds. After Round 3, 10 essential components of the management of PPGP reached consensus: pain education; postural and ergonomic advice; social and lifestyle factors; psychological factors, cultural considerations, strengthening exercise, other exercise, exercise precautions, manual therapy, and the use of crutches.

**Conclusions:** Ten components were identified that clinicians should consider in their management of women with PPGP. These components also provide a framework for future research into the conservative management of PPGP.

**Implications:** Managing patients with PPGP is complex, with experts across a range of health professions suggesting it is essential to consider several treatment components. While some components such as cultural and psychosocial aspects are evidence-based and important from a patient-centred case perspective, others such as pain neuroscience education and postural and ergonomic advice lack clinical evidence.

## SUBACROMIAL BURSITIS AND SHOULDER PAIN: EXPLORING THE PREDICTORS FOR A NEGATIVE ANAESTHETIC RESPONSE

**Betteridge, S[1]., Devan, H[2]., & Cadogan, A[1].**

[1]*Advance Physiotherapy, Christchurch;* [2]*University of Otago*

**Background:** Subacromial bursitis is a common ultrasound finding in people with shoulder pain. It can be treated with bursal corticosteroid injection.

**Purpose:** The aim of this retrospective cross-sectional study was to (1) investigate the association between the presence of subacromial bursal pathology and response to subacromial anaesthetic injection; (2) identify variables predicting a negative anaesthetic response; and, (3) calculate diagnostic accuracy of predictors.

**Methods:** A total of 208 people with shoulder pain referred from primary care received an ultrasound guided local anaesthetic injection into the subacromial bursa following standardised clinical examination. Pain was recorded on a visual analogue scale and participants completed self-reported questionnaires. Kruskal-Wallis test, logistic regression analyses and diagnostic accuracy statistics were utilised.

**Results:** No difference in pain reduction post-injection was found between those with and without bursal pathology ($p < 0.05$). Five potential predictors of a negative anaesthetic response were identified, which did not reach statistical significance. Use of a cluster of any three predictors of a negative anaesthetic response (high occupational shoulder demands; high or low sport/recreational shoulder demands; no current history of night pain; loss of passive external rotation range of movement of more than 30° and shoulder pain reproduced on cervical spine testing) results in post-test probability of 93% (pre-test probability 69%).

**Conclusions:** Not all bursal pathology identified by ultrasound is symptomatic. The high specificity and moderate positive likelihood ratio associated with the presence of any three of the five predictors provides support for an assumption that a patient with such a finding would be more likely not to respond to targeted injection therapies

Implications: Ultrasound results should be considered alongside clinical findings to better inform decisions regarding most appropriate treatment. This may lead to a reduction in the use of unnecessary injections in patients with shoulder pain.

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## PERCEPTIONS OF A PHYSICAL ACTIVITY AND TEXT MESSAGING PROGRAMME FOR ADULTS WITH OBSTRUCTIVE SLEEP APNOEA

**Brockway, B., Skinner, M., Waters, D., & Rhodes, S[1].**

*[1]University of Otago*

**Background:** Obstructive sleep apnoea (OSA) is associated with increased morbidity and mortality from cardiovascular disease. Physical activity is protective against the symptoms linked to OSA and is a known moderator for cardiometabolic risk. However, physical inactivity is common in populations with high cardiometabolic risk and low motivation is a known barrier to being physically active. Our feasibility study focused on a physical activity and text messaging programme to enhance motivation and support physical activity behaviour change in adults with OSA.

**Purpose:** To determine the perceptions of adults with OSA who completed a feasibility study, focussed on physical activity and motivation through text messaging.

**Methods:** Fifteen-minute phone interviews were conducted with 17 individuals., A semi-structured question format was used, with an emergent design approach employed to allow for flexibility including unscripted follow-up questions. Interviews were recorded and transcribed verbatim. The collated data were analysed using Braun and Clarke's thematic analysis. Initially, 148 codes were identified and through a process of repeated review and interpretation of the coded data, eight themes were eventually generated.

**Results:** The key themes were exercise is worthwhile; the impact of text messages; content and delivery of texts; motivation; connection; barriers and enablers; self-management; and investment in the study.

**Conclusion(s):** The majority of interviewees regarded exercise as 'worthwhile' and recognition of this appeared to be linked to positive changes in motivation over time. The personalised nature of the text messages and a sense of connection to the study appeared to further support participant motivation. Recognition of the need to take responsibility for physical activity behaviour over time suggested there was a move towards self-management.

**Implications:** A physical activity programme in conjunction with personalised text messaging shows promise as a means of supporting adults with OSA to make positive changes to their physical activity behaviour.

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## PHYSIOTHERAPIST AND PATIENT PERCEPTIONS OF STRATIFIED ACUTE LOW BACK PAIN CARE IN NEW ZEALAND

**Chapple, C[1]., Ellis R[2]., & Hill J[2].**

*[1]University of Otago, [2]Auckland University of Technology*

**Background:** While acute low-back pain (LBP) has a generally favourable course, ongoing pain and recurrent pain are common. Better management of acute LBP may decrease long-term impact on individuals and decrease costs. STarT Back is a stratified care approach, identifying subgroups of patients at risk of persistent LBP and providing matched care. Although clinically and cost-effective, its use in New Zealand (NZ) is inconsistent.

**Purpose:** To explore patient and physiotherapist perspectives about their experience of LBP care in NZ, and the acceptability of STarT Back.

**Methods:** Six online focus groups were conducted with people with LBP (four) and physiotherapists (two). Data comprising transcriptions of audio recordings, notes, and reflective statements were analysed using reflexive thematic analysis.

**Results:** Participants with LBP reported uncertainty navigating a chaotic clinical environment. Many reported “shopping around” for different treatments. They felt STarT Back provided a good framework, allowing clear treatment expectations. Discussion of psychosocial factors was acceptable if conducted by a trusted health professional and clearly explained.

Physiotherapists were confident recognising psychosocial factors during assessment, but not in managing these factors. Many preferred onward referral of patients to psychologists or general practitioners. Physiotherapists identified differences between health systems in the United Kingdom and NZ meaning patients with acute LBP accessed care much earlier in NZ. Hence, anxiety or fear of movement displayed by patients was understandable, rather than a risk factor for poor outcome. They were more likely to consider use of STarT Back if symptoms persisted.

**Conclusion:** Benefits of STarT Back were identified for people with acute LBP. However, adaptations to the NZ context are necessary.

**Implications:** STarT Back could benefit patient experience; Discussion of psychosocial factors is acceptable; Physiotherapists need further training to develop confidence in managing psychosocial factors in patients with acute LBP; STarT Back requires further research before implementation in NZ.

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## ADAPTING A QUALITATIVE DESCRIPTIVE REHABILITATION RESEARCH METHOD TO SUPPORT A MÄORI-CENTRED APPROACH

**Charlesworth, K., Barlow, R., Wilson Uluinayau, T., Wilson, B., Alder, G., & Signal, N.**

*Auckland University of Technology*

**Background**: As healthcare professionals and researchers, it is essential that we work to address the inequities in access to and outcomes from rehabilitation, experienced by Māori. Amplifying Te Ao Māori (Māori worldviews), Māori whakaaro (opinions and ideas) and mātauranga (knowledge) in rehabilitation research and practice is an important step toward achieving these aims.

**Purpose:** This presentation describes the process undertaken to adapt an existing qualitative descriptive research method, aimed at establishing the user requirements for robotic devices for upper-limb rehabilitation following stroke, to support a Māori-centred approach.

**Methods:** A bicultural research team (Māori and non-Māori) utilised the Meihana Model of health and the Hui Process for clinical engagement to adapt the research method.

**Results:** Developing bicultural working relationships within the research team supported us to ensure that the needs of whānau Māori, both as part of the research team and as research participants, were prioritised. The Hui Process was applied through researcher interactions with participants and influenced their entire journey throughout the research. Changes to the recruitment process, information provided and initial engagement enhanced whakawhanaungatanga (connections). Data collection was tikanga led, facilitated by a Māori researcher opening and closing interactions with karakia (blessing), and mihimihi (introductions) meaningfully shared between researchers and participants to support the cultural safety of all involved. Application of the Meihana Model enabled a conceptual and structural reframing of the interview. The interviews addressed not only concepts of person, whānau (support network), wairua (spirituality), tinana (physical health), hinengaro (psychological and emotional wellbeing), taiao (physical environment) and iwi katoa (services and systems) as they related to rehabilitation robotics but also the broader concepts of Nga Hau e Wha (the historical and societal influences on Māori) and Nga Roma Moana (how Māori world views may influence Māori in clinical settings).

**Conclusion:** Explicitly applying Māori models of health and healthcare provision to research design supported us to enhance the cultural responsiveness of the research.

**Implications:** Rehabilitation researchers often seek to include a Māori perspective in their research but may not have the confidence or skillset to be able to conduct Māori-centred research. This presentation offers practical ideas and tools which bicultural research teams can apply to future research to empower Māori voices and practices.

## DEVELOPING AN INTERDISCIPLINARY PATHWAY OF CARE FOR NEW ZEALANDERS WITH TEMPOROMANDIBULAR DISORDERS

**Falling, C., & Dick, M.**

*University of Otago*

**Background:** Temporomandibular disorders (TMD) are musculoskeletal conditions involving the jaw, characterised by ongoing pain and mechanical symptoms. Up to 75% of people may have signs or symptoms of TMD, yet only 5–10% seek care. Patients report difficulty in navigating healthcare systems to find knowledgeable practitioners, obtaining adequate and consistent information, and receiving timely care. The complexity of TMD creates significant clinical challenges, causing many clinicians to lack confidence in assessing and managing patients. Despite numerous treatment approaches, reports suggest a notable failure to treat people effectively and efficiently, which is attributed to a lack of integrated care. TMD management is largely unfunded with increasing service costs, creating significant barriers to care. New Zealanders with TMD are often referred to dental services, where appointment waitlists are extensive, creating a bottleneck effect and limiting access to treatments, such as physiotherapy. Consequently, an interdisciplinary model of care is needed to improve health outcomes in New Zealanders with TMD.

**Purpose:** This programme of research aims to identify successes and limitations of current TMDcare pathways, issues surrounding equity of access and service delivery, patient and clinician priorities for care.

**Findings:** Research activities include review of clinical practice guidelines, clinical audits, and stakeholder engagement. Guidelines suggest multidisciplinary approaches to care yet acknowledge the lack of integration in current practice. Clinical audit of one tertiary TMD service indicates a waitlist of over 250 patients, where 52% have been referred by their general practitioner. Clinician engagement confirms the lack of integration of TMD care in NZ, with few referrals to physiotherapy. Conclusion and implications: This programme of research aims to develop an interdisciplinary framework that addresses inequities in access to TMD services through priority setting, identifying facilitators/barriers to care, and integration of clinical specialties. This represents a collaboration between Māori and non-Māori researchers, clinicians, patients, and stakeholders.

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## PHYSIOTHERAPY TREATMENT AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION IMPROVES SUBJECTIVE RATINGS OF KNEE SYMPTOMS AND FUNCTION

**Garrett, N., Fausett, W., Reid, D., & Larmer, P.**

*Auckland University of Technology*

**Background:** Patient outcomes following anterior cruciate ligament reconstruction (ACLR) are influenced by multiple factors, including the quantity of pre- and post-surgical physiotherapy treatment. However, the relationship between the quantity of physiotherapy treatment and patient outcomes following ACLR is unclear.

**Purpose:** To determine the relationship between the quantity of physiotherapy treatment and patient-reported outcomes (PRO) following ACLR in NZ.

**Methods:** We used PRO data from the NZ ACL Registry and physiotherapy treatment data from the Accident Compensation Corporation (ACC). Multiple regression analysis was used to determine the likelihood of subjects achieving a Patient Acceptable Symptom State (PASS) on the Knee Injury and Osteoarthritis Outcome Score (KOOS) or a normative score on the Marx Activity Rating Scale (MARS).

**Results:** Following data matching and exclusions, 5345 subjects were included in the final analysis (male = 53%; average age at ACLR = 29.4 years). Average number of physiotherapy treatments in the 24 months post-ACLR was 11.7 ± 10.5. The percentage of subjects achieving a $\text{KOOS}^4$ PASS score and normative MARS score at 24 months post-ACLR was 75% and 28% respectively. When adjusted for confounders (age at ACLR, gender, days from ACL injury to ACLR, presence of vocational rehabilitation), physiotherapy treatment between 0–12 months post-ACLR was associated with an increased likelihood of achieving a $\text{KOOS}^4$ PASS score ($p = 0.0035$). When adjusted for confounders, physiotherapy treatment was not associated with an increased likelihood of achieving a normative MARS score ($p = 0.15$).

**Conclusion(s):** Physiotherapy treatment following ACLR increases the likelihood of achieving an acceptable level of symptoms after 12 months but is not associated with achieving a 'normal' level of activity.

**Implications:** Following ACLR, physiotherapy treatment may improve how a patient feels about their knee. However, factors other than physiotherapy treatment i.e., age, gender, delay to surgery, are likely to influence post-surgical activity levels more.

## PREPARATION AND SUPPORT FOR PHYSICAL ACTIVITY ENGAGEMENT FOLLOWING CABG SURGERY IN NEW ZEALAND

**Gray, E[1]., Skinner, M[1]., Hale, L[1]., Bunton, R[2].**

*[1]School of Physiotherapy, University of Otago; [2]Department of Surgical Sciences, University of Otago*

**Background:** Engagement in physical activity following coronary artery bypass graft (CABG) surgery has many potential physical and psychological barriers. People who have undergone CABG surgery need to self-manage their return to physical activity engagement, including overcoming barriers, after discharge home.

**Purpose:** The aim of this study was to examine the current practice in New Zealand hospitals to prepare and support people to engage in physical activity following CABG surgery.

**Methods:** A questionnaire was sent to all New Zealand hospitals that provided cardiac surgery services and granted locality authorisation for participation in the study. One health professional was requested to complete the questionnaire on behalf of their hospital service.

**Results:** Locality authorisation was granted by nine of the 11 hospitals. Responses were received from 5/5 public and 4/6 private hospitals. All sites reported they prepared people to engage in physical activity. However, there were inconsistencies in the advice provided for the frequency and rate of progression of exercise; timing of reintroduction of activities of daily living; and sternal precautions. Potential gaps identified from the responses included a lack of information on safe engagement for resistance exercise; limited facilitation of self-management skills, including problem solving to manage potential barriers; and a general lack of follow up support provided to individuals not able to attend an outpatient cardiac rehabilitation programme.

**Conclusion(s):** The findings provided a benchmark for current practice in New Zealand and identified areas where guidelines for preparation and support may be enhanced.

**Implications:** Including evidence-based information regarding resistance exercise, and a greater emphasis on facilitating self-management skills may result in improved outcomes for patients, particularly those unable to access outpatient cardiac rehabilitation. The inconsistencies in preparation and follow up support that are currently provided across services in New Zealand indicate the potential need for enhancing guidelines for practice in this area.

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## THE EFFECT OF AGE, SEX, THORACIC KYPHOSIS AND HEIGHT ON ACROMIOHUMERAL AND CORACOHUMERAL DISTANCES. AN ULTRASONOGRAPHIC STUDY

**Kennedy, M., Nicholson, H. D., & Woodley, S. J.**

*University of Otago*

**Background:** Shoulder pain has been associated with changes in the acromiohumeral distance (AHD) and coracohumeral distance (CHD). While manual therapy techniques may influence shoulder position, little is known about how these anatomical measures may be influenced by age or other factors in healthy individuals.

**Purpose:** To determine, in healthy volunteers, the relationship between anatomical parameters (AHD and CHD) and independent variables including age, sex, thoracic kyphosis and height.

**Methods:** One hundred and four participants (52 male, mean age ± SD 45.9 ± 16.0 years) without a history of shoulder pain underwent ultrasonographic assessment of AHD (in neutral and shoulder abduction) and CHD (in neutral and shoulder elevation). The length and height of the thoracic curvature (C7 to T12) were measured and expressed as an index. Associations between variables were explored using multiple linear regression analysis.

**Results:** Age, sex and thoracic index were not significantly related to the measures of AHD or CHD ($p > 0.5$). Height showed a significant positive relationship with AHD in neutral ($p < 0.05$) and CHD (in neutral and shoulder elevation; $p < 0.05$), explaining between 5.6% and 14.2% of the variation in these measures.

**Conclusion:** These results clarify that measures of AHD and CHD in healthy volunteers are not associated with age, sex or thoracic kyphosis, yet do relate to stature.

**Implications:** When considering shoulder pain, physiotherapists require an understanding of factors that influence measures of the subacromial and subcoracoid spaces in healthy individuals. These data provide a basis for further research in people with shoulder disorders.

## EVALUATING THE CERVICAL SPINE IN CONCUSSION. A SCOPING REVIEW OF STANDARDISED CONCUSSION EVALUATION TOOLS

**Mohai, A[1]., Gifford, J[1]., Herkt, R[1]., Parker, A[1]., Toder, A[1]., Dixon, D[2]., & Kennedy, E[1].**

*[1]University of Otago; [2]Southern District Health Board*

**Background:** It can be a challenge for clinicians to evaluate trauma that could represent cervical spine injury, concussion, or both. These conditions share common mechanisms of injury and symptom profiles, yet distinct aetiology and management. In the clinical evaluation of concussion, a range of standardised tools are available but the extent to which such tools include cervical spine evaluation is unclear.

**Purpose:** To identify a variety of standardised clinical concussion evaluation tools, examine if these tools include cervical spine evaluation, and describe the characteristics of cervical spine evaluation included. To have an informed discussion about how cervical spine evaluation might best be approached after a concussion event.

**Methods:** A structured literature search was performed in eight databases to identify standardised clinical concussion evaluation tools. Each tool was then reviewed for cervical spine evaluation, and the cervical spine evaluation components of tools were extracted and summarised.

**Results:** The structured search identified 82 standardised clinical concussion evaluation tools. Eleven tools included cervical spine assessment related primarily to the evaluation of red flags and neck pain as a symptom, just three included physical examination.

**Conclusion(s):** Few standardised clinical concussion evaluation tools include cervical spine evaluation, and even fewer include physical examination. Cervical spine evaluation in concussion may benefit from closer alignment with established approaches to screening for clinically significant cervical spine injuries such as the Canadian C-Spine rules and NEXUS criteria. This has the potential to improve screening for red flags and assist in identifying cervicogenic symptoms.

**Implications:** We advocate for an approach to cervical spine evaluation in suspected concussion that includes screening for dangerous mechanisms of injury, neurological deficit, distracting injury and neck pain; and physical examination of neck range of motion and neck tenderness.

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## DRIVERS AND BARRIERS TO THE DEVELOPMENT OF ADVANCED PHYSIOTHERAPY PRACTITIONER ROLES IN NEW ZEALAND

**Naik, L., Reid, D., White, S., & Neville, S.**

*Auckland University of Technology*

**Background:** Musculoskeletal complaints affect one in four New Zealanders, accounting for 25% of its total annual health spending. Internationally, Advanced Physiotherapy Practitioner (APP) roles have demonstrated the ability to impact on orthopaedic waiting lists and improve timely patient access to specialist care and services. In 2011, Health Workforce New Zealand, recommended up-skilling physiotherapists into APP roles to work in collaboration with multidisciplinary teams to deliver future musculoskeletal healthcare. Nevertheless, these roles have not gained traction in New Zealand (NZ).

**Purpose:** This study investigated the drivers and barriers to APP role development in the NZ context.

**Methods:** An exploratory single embedded case study design was used. Document analysis, qualitative survey data analysis, and semi-structured interviews were utilised as data sources. A purposive sampling strategy was used. Data were analysed using qualitative content analysis and triangulated to ensure rigour.

**Results:** The results of this research identified access to care, service needs, government drivers, fiscal constraints, legislative drivers, surgeon-led drivers, and profession-led drivers as the key drivers for APP role development in NZ. Interviewees identified that APP role development barriers relate to NZ's dual healthcare system with split funding streams between the Ministry of Health and Accident Compensation Corporation. Additional barriers include a lack of recognition, lack of funding, lack of training, lack of career pathway, lack of title recognition, inter-professional barriers, and intra-professional barriers.

**Conclusions:** This research identifies a niche for the APP role in NZ and explores the reasons for the limited uptake of the APP roles in the NZ context despite these strong drivers. These findings need to be considered by the stakeholders when considering the APP role implementation in the NZ context.

**Implications:** Development of APP role has implications for patients, practice, profession, universities, and legislative body. To ensure its promising future, APP roles need to be tailored to meet NZ's unique healthcare drivers and reduce the barriers.

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## WHAT MATTERS MOST TO NEWLY QUALIFIED PHYSIOTHERAPISTS AS THEY NAVIGATE THEIR EMERGING PROFESSIONAL IDENTITY?

**Neal, A[1]., Murthy, V[1]., Waterworth, K[1]., Cummins, C[1]., Søgaard Hansen, L[2]., & Mudge, S[1].**

*[1]Auckland University of Technology; [2]Roskilde University, Denmark*

**Background:** The first five years post-graduation are a critical time for the novice practitioner as they internalise a range of implicit values, behaviours and understandings that become embedded in their future professional identity. Although often viewed in research as an individual acquisition, professional identities are developed within communities of practice. These socio-material and contextual structures have had limited attention in research to date.

**Purpose:** We conducted a qualitative study to investigate the experiences of the novice physiotherapist, to understand how they navigate the day to day demands of their role to explore the contextual factors that influence their emergent professional identity. This presentation reports on one aspect of the analysis conducted as part of the supervised 4th year student research project and focuses on the value that newly qualified physiotherapists placed on feeling supported in their roles.

**Methods:** Semi structured interviews were conducted via video-calling with ($n$ = 12) physiotherapists from across Aotearoa, who were up to five years post-graduation from a New Zealand physiotherapy qualification. Data were analysed using thematic analysis.

**Results:** Support mattered, however, what was conceived of as support varied across individuals and contexts. Physiotherapist who reported satisfaction with their role and a strong sense of professional identity described clear and responsive support systems within their communities of practice.

**Conclusions:** Communities of practices need to be able to respond to diverse preferences for support.

**Implications:** Those concerned with entry-to-practice and professional development may wish to consider how established communities of practice are able to respond to and meet these needs. Managers and the industry more generally could consider how preferred types of support early in a career may relate to retention rates for mid-career physiotherapists.

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## CO-DESIGNING AN OSTEOARTHRITIS PATIENT GUIDEBOOK FOR AOTEAROA NEW ZEALAND: MORE THAN JUST PRETTY PICTURES

**O'Brien, D[1]., Ellis, R[1]., Nakarada-Kordic, I[1]., Khoo, C[1]., Wilson, B[1]., Cahan, J[1]., Quicke, J[2]., & Baldwin, J[3].**

*[1]Auckland University of Technology; [2]Keele University, UK; [3]The University of Sydney, Australia*

**Background:** Osteoarthritis (OA) affects one in ten people in Aotearoa New Zealand (AoNZ), costing the healthcare system hundreds of millions of dollars annually. Effective patient education resources are considered a crucial part of high-value OA care, with OA guidebooks a common method of patient education and knowledge translation. Despite the widespread availability of OA guidebooks and written resources, few are designed for the AoNZ context, and little research exists about the development and testing of these resources.

**Purpose:** We aimed to co-design an OA guidebook specific for AoNZ, drawing upon the experiences and perspectives of a diverse group of people with direct knowledge and understanding of OA.

**Methods:** We used a multi-phase, collaborative co-design approach (idea generation, development, testing, refinement), including prototyping, workshop, and individual data collection. Participants were purposively sampled and included patients, the public, patient advocacy groups; a wide range of healthcare professionals active in OA management; and health researchers. Data were analysed using qualitative content analysis.

**Results:** Across the four phases of the collaboration, data were collected via five workshops and 32 individuals. Data analysis identified five key themes that guided the construction of the book: (1) *The 'Goldilocks zone' – considering cultural, social, and psychological impacts;* (2) *What you write matters;* (3) *Keeping it simple*; (4) *The value of design;* (5) *Take-home messages*.

**Conclusion(s):** We experienced a high level of stakeholder engagement. Findings showed that participants liked aspects of the prototypes and highlighted several areas that merited improvement, including balancing the bi-cultural context, the tone of written content, and the communication messaging implied by some images and layout.

**Implications:** It is never too early to engage stakeholders when developing health education resources, and don't underestimate the time required for meaningful collaboration. This bespoke resource will be freely available for OA management services in AoNZ.

## VARIABILITY OF COUGH ASSIST (MI-E) SERVICE PROVISION ACROSS NEW ZEALAND FOR PEOPLE WITH NEUROMUSCULAR DISORDERS

**Perry, M[1]., Fung, C[1,2]., Neill, A[1,2]., Jones, B[1]., & Ingham, T[1].**

*[1]University Of Otago; [2]Capital and Coast District Health Board*

**Background:** Neuromuscular disorders (NMD), affecting approximately 22.8 per 100,000 New Zealanders, can cause reduced cough strength leading to an inability to clear secretions from the proximal airways and subsequent respiratory morbidity or mortality. Mechanical insufflation-exsufflation (MI-E or Cough Assist) machines may assist with secretion clearance. The number of, and criteria for, MI-E prescription is unknown in NZ. Experiences of physiotherapists as MI-E providers and people with NMD as consumers of MI-E are also unknown.

**Purpose:** To explore MI-E service provision for people with NMD.

**Methods:** This research used mixed-methods to 1) survey DHB's about number of MI-E machines and guidelines for prescription; 2) interview physiotherapists about MI-E training and experience with administering MI-E and; 3) interview people with NMD about their experiences of being administered MI-E. Survey data was descriptively analysed. Interview data was analysed thematically.

**Results:** The number of MI-E machines in each DHB was highly variable and not proportionate to the population with NMD in that DHB area. Physiotherapists described variable amounts of MI-E training and access to MI-E. Participants with NMD described differences in service provision between DHBs; several participants bought their own machine.

**Conclusion(s):** There is inequitable service delivery of MI-E machines occurring at meso and micro system levels across NZ. Physiotherapists were, at times, forced to make difficult decisions when determining who had access to this limited resource. Participants perceived the MI-E machine not as a "nice to have" but as "life-saving".

**Implications:** National service specifications, with dedicated funding, which would support the provision of acute and community funded MI-E machines for patients with complex respiratory conditions, are required to ensure equitable access. Educational resources and regular training opportunities for physiotherapists, and people with NMD and their carers are required to ensure upskilling of MI-E recommendations and practicalities of use.

## NEXT GENERATION PHYSIOTHERAPY: FUNCTIONAL ACTIVATION USING VIRTUAL REALITY IN CHRONIC PAIN MANAGEMENT

**Pollard, C[1,2]., Tuck N[2]., & Bean, D[2].**

*[1]Auckland District Health Board, [2]Auckland University of Technology*

**Background:** Improving function in people with chronic pain is vital. Virtual reality (VR) games may make functional activation more fun, promoting greater success with therapy.

**Purpose:** To determine the feasibility of conducting a randomised controlled trial to explore the efficacy of VR as an intervention for people with chronic pain and to assess the acceptability of VR treatment for this patient cohort.

**Methods:** The feasibility study utilised a mixed-method approach. Twenty-nine subjects with chronic pain attending a tertiary pain service were randomised to an active VR intervention or physiotherapy treatment as usual (TAU). The TAU group completed a 6-week waitlist (WL) preceding treatment, to act as a no treatment control group. The VR intervention involved physiotherapy directed, twice weekly immersive games focussed at increasing movement. Seven VR participants also completed semi-structured interviews to assess their perceptions of the intervention.

**Results:** Of 99 patients referred to physiotherapy, 53 were eligible, 29 enrolled, and 17 completed the trial. VR group participants exhibited greater improvements in activity levels, pain intensity, pain interference, as well as greater treatment satisfaction, and perceived improvement compared to both WL and TAU. Relative effect sizes were larger when VR was compared to WL, and smaller when VR was compared to TAU. Qualitative analysis revealed three themes; 1) VR is an enjoyable alternative to traditional physiotherapy; 2) VR has functional and psychological benefits despite continued pain, and 3) a well-designed VR set-up is important.

**Conclusion(s):** VR was highly acceptable, producing positive effects compared to no treatment and similar outcomes as TAU. A larger RCT is warranted, however low recruitment indicates that a different setting or multicentre trial is needed.

**Implications:** VR is growing in popularity and has been deemed effective for managing acute pain episodes. Its use in chronic pain management is currently being investigated with early work demonstrating positive outcomes, however further research in this field is required.

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## ESCALATED CARE PATHWAYS – A VISION FOR THE FUTURE OF PHYSIOTHERAPY

**Reid D., Lowry, P., & Stewart, A.**

*Auckland University of Technology*

**Background:** In 2020 the Accident Compensation Corporation (ACC) initiated a series of pilot programmes named Escalated Care Pathways (ECP) to improve the pathway of people with knee, shoulder and spinal injuries. The pilots were aimed to improve four key areas: Faster return to work, improved utilisation of services, more timely access to surgery and rehabilitation and improved equity and access for Māori and pacific peoples. Careway, based in Auckland, was one of the five successful pilot groups and was an inclusive model to join physiotherapists and specialists.

**Purpose:** The purpose of this presentation is to outline the processes and systems that were developed by Careway to meet the aims of ECP.

**Methods:** A series of working groups were set up to develop clinical pathways for acute knee injuries (ACL), traumatic rotator cuff tears, and leg dominant low back pain. The groups consisted of leading orthopaedic surgeons, private practice physiotherapists, sports physicians, academics and consumer groups These groups developed resources and processes that were innovative, evidence based and patient centred.

**Results:** The new areas of innovation were: 1) tight criteria for entry to the pathway for surgery and/or well guided conservative care; 2) The use of patient reported outcome measures at baseline and 6 weekly intervals; 3) the use of key strength measures per body site; 4) clear measures of success at discharge; 5) the early implementation of vocational rehabilitation.

Once agreed, these pathways were delivered as a series of education packages to over 55 orthopaedic surgeons and 500 physiotherapists in the Auckland region.

**Conclusion(s):** To date these pathways have been well accepted by surgeons, sports physicians, physiotherapists and vocational therapist. Further evaluation is due in the next 18 months.

**Implications:** ACC is keen to support these pathways and move towards this being a better way of improving patient outcomes and working with key health providers.

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## BARRIERS AND FACILITATORS FOR PHYSIOTHERAPISTS ENGAGING WITH THE CAREWAY ESCALATED CARE PATHWAY PILOT PROGRAMME

**Reid, D., Stewart, A., & Cassidy, C.**

*Auckland University of Technology*

**Background:** In 2019, ACC launched a series of pilot programmes termed escalated care pathways (ECP); one of the successful pilots in the Auckland being Careway. Careway aims to provide a smoother, simpler, and faster recovery for New Zealanders with ACC knee, shoulder, or spine injuries. These areas of focus were chosen as they are injuries of high cost to ACC with respect to rehabilitation and earning-related compensation

**Purpose:** The aim of this study was to explore the barriers and facilitators to physiotherapists engaging with the new Careway pilot.

**Methods:** Qualitative study. Semi-structured focus group methodology was used to complete a service audit. The focus group of New Zealand physiotherapists involved in the Careway pilot were transcribed verbatim and analysed using content thematic analysis.

**Results:** Two overarching domains emerged for both barriers and facilitators: Physiotherapist perspectives, and perceived patient perspectives. Factors which were commonly cited as barriers to engagement included challenges undertaking outcome measures (OM), limited treatment time when implementing OMs, communication disconnects, logistical difficulties, and patient-related psychological factors. These barriers corresponded with suboptimal patient outcomes, particularly for Māori, Pasifika, and other minority cultures within NZ who tend to be of low socioeconomic status. Factors which were commonly cited as facilitators included having a clear rehabilitation plan, strong therapeutic relationship, and improved access. These factors were associated with improved patient outcomes, and removal of key barriers to healthcare for the aforementioned populations.

**Conclusion(s):** The Careway programme is providing clear rehabilitation benefits for physiotherapists and patients, however there remain barriers to rehabilitation which are yet to be overcome. It is evident that biopsychosocial factors which reinforce patient-centred care facilitate patient engagement, and therefore contribute to removal of rehabilitation barriers and improved patient outcomes.

**Implications:** Future research should investigate further way to reduce barriers and increase engagement in the current rehabilitation process

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## TRIALS AND TRIBULATIONS OF NON-INCREMENTAL, CLINICIAN-LED PRACTICE CHANGE: TWO CASE STUDIES

**Seller, D[1,2].**

*[1]Capital and Coast District Health Board; [2]University of Otago*

**Background:** Practice change comes in many forms, and is driven by many factors. Small scale, incremental practice change often occurs in response to new evidence. Large scale practice change often require bigger stimuli, such as a pandemic.

**Purpose:** This abstract describes the processes of introducing two techniques: ventilator hyperinflation (VHI) and point of care lung ultrasound into physiotherapy practice in Wellington Hospital Intensive Care Unit (ICU).

**Methods:** The pathway for VHI introduction was: discussion with ICU director, commencement of clinical use by senior ICU physiotherapist, presentation to ICU Clinical Practice Group, guideline development, training of senior ICU physiotherapists, and development of a training package for rotational ICU physiotherapists. Lung ultrasound was a novel technique for Wellington ICU physiotherapists. The pathway for its introduction: online e-learning, attendance by senior physiotherapist at ICU consultant education sessions, guided clinical use with lung ultrasound expert, independent practice during usual clinical work, scan reviews with ICU consultant, practise on healthy volunteers.

**Results:** VHI is now used by all senior physiotherapists in Wellington ICU, and the past two rotational physiotherapists have completed the competency package. It is an accepted physiotherapy treatment with medical and nursing staff.

There are now three other physiotherapists learning to perform lung ultrasound, under the guidance of the senior ICU physiotherapist, and supervision of an ICU consultant.

**Conclusion(s):** The main barrier to introduction of these techniques was the reliance on passionate staff to overcome "existing practice" inertia. The main facilitator was a strong relationship with the senior medical staff in Wellington ICU.

**Implications:** Clinician-led practice change is vital, but difficult without interdisciplinary support.

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## CO-CONSTRUCTING A WEBSITE FOR PEOPLE WITH SHOULDER PAIN AND HEALTH PROVIDERS

**Sole, G[1]., Acker, R[1]., Calder, A[1]., Longnecker, N[1]., Pons, T[2]., Stein, J[1]., Swain, N[1]., & Wassinger, C[3].**

*[1]University of Otago; [2]Pain Physiotherapy; [3]Tufts University, USA*

**Background:** Improving access to evidence-based information for people living with musculoskeletal conditions is likely to enhance patients' ability for self-management and to discuss treatment options with health providers. Existing websites relating to shoulder pain are generally limited to information about patho-anatomy without considering psychosocial and neurophysiological influences.

**Purpose:** To co-create a website to improve health literacy and self-management for people with shoulder pain in Aotearoa New Zealand.

**Methods:** We used participatory action research (PAR) with five cycles. A culturally-diverse group of participants were recruited from the community, organisations and professional email lists. Six physiotherapists and 7 people with shoulder pain participated. Break-out groups were formed for people with shoulder pain, physiotherapists and a mixed group for Māori and Pasifika. Meetings 2 to 4 were recorded, transcribed and thematically analysed. Themes were used to plan and construct the website. The University's Office of Māori Development provided te reo (sub)headings. We used the Flesch Kincaid Reading Ease Scale to ensure acceptable readability level, following requirements for HONCode certification.

**Results:** Themes were grouped as Content (Understanding terminology for the shoulder girdle; Why we feel pain; Whole body health; Common conditions; and Treatment options), Presentation (images reflecting Aotearoa people) and Further Support. PAR members assessed two iterations of the website, providing feedback that enabled culturally important concepts to be interwoven with research-based evidence. This enhanced inclusivity and participants were satisfied with the process and the product.

**Conclusion(s):** PAR was effectively used to obtain input for content considered important by people with shoulder pain and by physiotherapists. This guided co-creation of the website.

**Implications:** Co-constructing patient resources with health providers and people living with musculoskeletal conditions is likely to enhance external validity, encourage use and collaborative decision making. Continuous feedback and updates for the website will make improvements and maintain relevance.

## A HYBRID MODEL OF REHABILITATION IN MILD TRAUMATIC BRAIN INJURY: A CO-DESIGN PROCESS

**Taylor, D[1]., Clay, L[1]., Shaikh, N[1]., Binks, S[2]., Wellacott, E[1]., Bloy, C[4]., Signal, N[1]., Wilkinson M[3]., & Howard-Brown, C[3].**

*[1]Auckland University of Technology; [2]SHI Global; [3]ABI Rehabilitation, [4]University of Auckland*

**Background:** Telerehabilitation, or the delivery of rehabilitation interventions remotely, has been slowly developing over the last decade. The COVID experience has dramatically impacted on the desire for telerehabilitation approaches both by health professionals and patients.

**Purpose:** To develop a localised prototype telerehabilitation package for people with mild traumatic brain injury (mTBI) through engagement with end-users at ABI Rehabilitation (Auckland).

**Methods:** A modified experience-based co-design approach was used. A focus group with clinicians ($n$ = 9) and semi structured interviews with 8 participants (5 people with mTBI and 3 clinicians) generated knowledge about the experience of rehabilitation after mTBI. Member checking followed by a co-design workshop with clinicians and a patient representative was used to develop a prototype hybrid telerehabilitation programme using an existing web-based platform.

**Results:** Building and maintaining a positive therapeutic relationship was highlighted as the most important component when designing a telerehabilitation intervention. The first face-to-face appointment was the crux to establishing trust and rapport. Factors to consider included the content (general to specific), format (written, videoconferencing, video, podcast, phone) and timing of information delivery (pre-assessment, assessment, programme, discharge) that was individualised and culturally appropriate. Participants found the web-based platform flexible and discussed the importance of operational simplicity. Issues with connectivity, digital literacy and privacy needed consideration along with alternative methods to optimise vestibular rehabilitation in the virtual space. A hybrid option combining in-person and telerehabilitation as appropriate was deemed ideal.

**Conclusion**: A prototype hybrid telerehabilitation package has been developed using co-design principles. A future implementation study will assess the clinical utility of this package.

**Implications:** User experience is important when designing new interventions. Telerehabilitation is an option that can overcome such barriers as distance from a specialist centre, availability of health care staff, culture and language and provide a mechanism by which patients 'remain connected to' the service.

## CLINICAL EXERCISE PHYSIOLOGY AS PART OF A MULTI-DISCIPLINARY APPROACH TO MANAGING CHRONIC CONDITIONS

**Wood, M., & Stratton, M.**

*Auckland University of Technology*

Clinical exercise physiologists (CEPS) are allied health professionals that provide advanced exercise physiology services to clinical populations with chronic diseases. CEPS are well placed to help address the individual needs of chronic disease patients and the burden it places on New Zealand's health system. CEPS utilise evidence-based best practice to develop individualised exercise prescription directly derived from assessments to meet the unique needs of various clinical populations. This is largely achieved through cardiopulmonary exercise testing which encompasses respiratory gas analysis to provide a full physiological profile and biomechanical analysis to quantify physical function. Most CEPS work with a wide range of patients to improve their physical capacity, mitigate disease progression, and prevent and/or delay secondary complications. Within the NZ setting, CEPS work in collaboration with health professionals as part of a wider rehabilitation team. Developing a multidisciplinary approach to chronic disease management builds on the strengths of both Physiotherapists and CEPS. Future health reform should include innovative service delivery models that offer a seamless continuum of care.

# RAPID 5 Abstracts

## DOES TREATMENT RECEIVED FOR HIP OR KNEE PAIN AND OSTEOARTHRITIS CONFORM TO GUIDELINE RECOMMENDATIONS?

**Abbott, J., Drake, K., Chapple, C., & Sharma, S.**

*University of Otago*

**Background:** International evidence suggests that people with hip or knee pain or osteoarthritis (OA) do not receive the most-recommended treatments that have been established in contemporary evidence-based guidelines. There is no recent Aotearoa New Zealand evidence regarding the uptake of interventions in this population.

**Purpose:** The aim of this cross-sectional survey was to describe the uptake of treatments recommended in the evidence-based guidelines among people with hip or knee pain or OA in Aotearoa New Zealand.

**Methods:** We conducted a population-based survey, mailed to randomly selected adults aged ≥ 18 years registered to vote in four lower North Island electorates. Respondents were asked if they have, in the preceding 12 months, experienced hip pain or knee pain, and also if they have been told, by a doctor, that they have OA. Respondents who reported the presence of joint pain were asked to tick boxes representing the types of treatment they have accessed and received.

**Results:** Of 494 people mailed the survey, 108 (22%; 45.9% female) responded. 37 participants (34.3%; 95% CI 25–43%) reported hip pain [of which 18 (48.6%) reported diagnosis with hip OA], 43 (39.8%; 31–49%) reported knee pain [of which 16 (37.2%) reported diagnosis with knee OA]; 19 (17.6%; 9–27%) reported both hip and knee pain. Of people with hip pain, 9–12 (24–32%) reported receiving guideline-recommended core (first-line) treatments; 19–23 (51–62%) reported receiving second-line treatments; 5 (13.5%) reported receiving physiotherapy. Of people with knee pain, 10–20 (23–47%) reported receiving first-line treatments; 12–22 (28–52%) reported receiving second-line treatments; 7 (16.3%) reported receiving physiotherapy.

**Conclusion(s):** The majority of people with hip or knee pain or OA in Aotearoa New Zealand do not receive the most-recommended treatments that have been established in contemporary evidence-based guidelines.

**Implications:** Improved access and delivery of recommended treatments for OA is urgently needed in Aotearoa New Zealand.

## URINARY INCONTINENCE MANAGEMENT AFTER STROKE: AN EXPLORATORY QUALITATIVE STUDY OF PHYSIOTHERAPY PRACTICES IN AOTEAROA

**Aldabe, D[1]., Downes, T[1]., Martin, R[2]., & Hay-Smith, J[2].**

*[1]University of Otago, Dunedin; [2]University of Otago Wellington*

**Background:** Urinary incontinence (UI) post-stroke is associated with poor rehabilitation outcomes. Stroke guidelines recommend a "structured assessment" for those with incontinence; the role of physiotherapists (PTs) in assessment or management is not described.

**Purpose:** This study aimed to explore New Zealand PTs' perceptions of their role in UI assessment and management post-stroke.

**Methods:** Eight PTs from across New Zealand, who worked with patients following stroke, were interviewed. Data were analysed using the General Inductive Approach.

**Results:** PTs involved in continence care post-stroke varied across hospital (less involvement) and community settings (more). Four main themes were derived: 1) "PTs' view of their scope of practice": Physiotherapy practice focused on activity limitations and participation restrictions to achieve patient goals. Therefore, physiotherapy management indirectly addressed functional UI. 2) "Resources and training of PTs": PTs considered that a lack of time and formal training, as well as uncertainty about who holds the responsibility for managing UI, limited their involvement with UI assessment and management. 3) "Collaboration between professions": PTs viewed nurses as the lead professionals for UI following stroke. They believed that more collaboration within the healthcare team would improve UI care. 4) "PTs views of UI assessment and management": PTs believed that UI management post-stroke is often focused on containment rather than recovery and that harmed patients' choice and dignity.

**Conclusion:** PTs felt they did not have primary responsibility for UI assessment and management, and lacked confidence to contribute – except indirectly – to continence care. PTs thought more collaborative discussions around continence decision-making and goals would improve patient care.

**Implications:** UI management post-stroke is complex and requires skilled health care professionals and excellent interprofessional collaboration. Further education and training for UI management following stroke is needed to improve PTs confidence to include this within their scope of practice.

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## THE IMPACT OF DESIRE-TO-VOID AND URINARY INCONTINENCE ON DUAL-TASK PERFORMANCE DURING GAIT ON OLDER WOMEN

**Aldabe, D[1]., Sullivan, A[1]., & Stigger, F[2].**

*[1]University of Otago; [2]Federal University of Health Sciences of Porto Alegre, Brazil*

**Background:** Aged women with urinary incontinence (UI) have a higher risk of falling than aged women without UI. People who fall and present with UI have increased frailty and significant associated hospitalisations, mortality, and morbidity. UI may interfere with cortical gait control, as UI symptoms are associated with abnormal gait patterns in adult women. UI may provide distraction leading to a cognitive cost during walking.

**Purpose:** This laboratory-based study aimed to assess: (1) the dual-task effect of the desire-to-void on gait performance during motor and cognitive dual-tasking and (2) the correlation between UI, desire-to-void and gait performance during motor and cognitive dual-tasking.

**Methods:** We invited women aged ≤65 through public advertisements in the community. Participants performed the time up and go test (TUG) in five different conditions: (1) no-desire-to-void baseline; (2) no-desire-to-void with motor dual-task; (3) no-desire-to-void with cognitive dual-task, (4) desire-to-void with motor dual-task and (5) desire-to-void with cognitive dual-task. Outcome measures: Time to perform TUG and the dual-task effect DTE. Severity of UI (ICIQ), cognition status (MOCA), history of falls and balance confidence (ABC) were also assessed via questionnaires.

**Results:** A total of 20 women (74 ± 6.10 years) participated. The ICIQ scores show no incontinence ($n = 4$), slight ($n = 7$), mild ($n = 7$) and severe ($n = 1$) incontinence. DTE results show that experiencing a full bladder while walking had a detrimental effect on motor ($p < 0.001$) and cognitive ($p < 0.001$) dual-task conditions. There was a weak correlation between the ICIQ and TUG baseline ($r = 0.48$, $p=0.03$) and a moderate correlation between ICIQ and TUG motor ($r = 0.52$, $p = 0.01$) and cognitive ($r = 0.52$, $p = 0.01$).

**Conclusion(s):** The desire to void negatively impacts dual-task walking performance in older women, even more so when they have UI.

**Implications:** Cognitive dual-task walking performance with a full bladder increases the risk of falling.

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## WHAT HELPS OR HINDERS FALLS PREVENTION IN RESIDENTIAL AGED CARE

**Binns, E., Bright, F., Parsons, J., Peri, K., Taylor, L., Kerse, N., & Taylor, D.**

*Auckland University of Technology*

**Background:** The fall rate for older adults living in residential age care (RAC) is higher than that of older adults living in the community. Research on exercise interventions to prevent falls in RAC has had mixed results. A randomised controlled trial (RCT) tested the effectiveness of a progressive strength and balance group exercise programme (Staying UpRight) delivered to RAC residents by physiotherapists, including people living with dementia.

**Purpose:** To explore what might help or hinder embedding Staying UpRight in usual practice in RAC and provide context for the findings of the RCT.

**Methods:** An effectiveness-implementation hybrid type 1 model, with a qualitative study undertaken secondary to the RCT. An Interpretive Descriptive methodology was utilised, with data collected from semi-structured interviews, focus groups and emails with RAC staff who had been involved in the RCT. Data was analysed using conventional content analysis.

**Results:** Embedding Staying UpRight as designed was constrained by organisational decisions on the use of funding and resources. Physiotherapists effectively adapted Staying UpRight to suit their environment or incorporated elements from the programme into their existing exercise groups.

**Conclusion(s):** Our findings highlighted that in the tight financial environment of RAC there is a lack of resource available to increase current levels of physiotherapy input to embed the Staying UpRight programme.

**Implications:** Different models of delivery or ways of working need to be explored if the current funding model for RAC does not change.

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## COGNITIVE AND FALLS PREVENTION EXERCISE COMBINED FOR PEOPLE LIVING IN RESIDENTIAL AGED CARE

**Binns, E., Kerse, N., Peri, K., Cheung, G., & Taylor, D.**

*Auckland University of Technology*

**Background:** People living with dementia (PLwD) have a higher falls risk, as cognitive impairment compromises control of gait and balance. Effective falls prevention exercises for healthy older adults may not work for PLwD. Cognitive Stimulation Therapy (CST) is a programme that can improve global cognition in PLwD. A programme combining cognitive (CST) and physical exercises may reduce falls in PLwD.

**Purpose:** To assess the feasibility of undertaking a full scale randomised controlled trial to test the effectiveness of a combined (CogEx) programme in decreasing falls in PLwD.

**Methods:** A mixed methods feasibility randomised controlled trial. Participants lived in residential aged care, were > 65 years old, had a Montreal Cognitive Assessment score of 10 to 26, and were able to participate in a group. Functional balance exercises were combined into the CST group structure (CogEx). Participants were randomised to CST or CogEx. Both groups were for an hour twice a week for 7 weeks. Participants completed pre- and post-intervention measures of cognition, balance and mobility. Attendance and exercise completion were recorded. Participant focus groups and facilitator interviews captured experiences of the programme.

**Results:** Thirty-six residents were screened with 23 participants randomised to intervention (CogEx, $n$ = 10) or control (CST, $n$ = 13). Ten facilitators completed intervention training. Exercises were combined into the hour-long CST session; however, balance training was limited as participants exercised predominantly in sitting. The facilitators felt the participants engaged more and were safer in sitting.

**Conclusion(s):** Falls prevention exercises can be combined into the CST structure however, the fidelity of CogEx was poor.

**Implications:** Other components of the study design need further consideration before evaluation using a randomised controlled trial is feasible.

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## DIAGNOSIS AND MANAGEMENT OF SHOULDER PAIN BY NEW ZEALAND PHYSIOTHERAPISTS: A NATIONAL SURVEY

**Craig, B[1]., Haas, R[2]., Buchbinder, R[2]., & Ribeiro, D[1].**

[1]*University of Otago;* [2]*Monash University and Cabrini Institute, Australia*

**Background**: Surveys conducted overseas suggest that physiotherapists follow best-practice evidence-based recommendations when managing patients with shoulder pain. There are no comparable studies in New Zealand.

**Purpose:** To: (1) determine current assessment and management of patients with shoulder disorders by physiotherapists in New Zealand and compare it to best evidence; (2) assess their confidence in making a diagnosis; and (3) determine whether caseload was associated with correct diagnoses of clinical vignettes.

**Methods:** Cross-sectional online survey of New Zealand registered physiotherapists ($n$ = 5702). Physiotherapists were surveyed about their assessment, management, and prognosis of four common shoulder disorders presented as vignettes. Best evidence was determined using findings from Cochrane reviews, systematic reviews, and clinical guidelines.

**Results:** 234 participants (response rate 4%) completed the survey. 63% participants were female, 78% worked in private practice and 73% had a shoulder caseload of ≥ 5 patients per week. Participants commonly included physical examination of cervical in addition to the shoulder joint. Responses on further investigations and referral to other healthcare professionals varied between vignettes. Advice, exercise, and education about exercise were the most prevalent interventions used for all four vignettes. Most participants were moderately or extremely confident in their diagnosis across all vignettes. We only found differences in correct diagnosis between participants with low and high shoulder caseload for Vignette 2 – acute rotator cuff tear (90% vs 80%, $\chi^2 = 3.55$, Fisher's $p = 0.047$).

**Conclusion(s):** Most physiotherapists self-report managing patients with shoulder disorders in accordance to best practice and clinical guidelines. Overall, participants were confident with their diagnosis. Clinicians with higher shoulder caseload were more likely to correctly diagnose patients with acute rotator cuff tear when compared to clinicians with a low shoulder caseload.

**Implications:** Findings from this study can inform continued the development courses, undergraduate and postgraduate studies, and special interest groups in New Zealand.

## FAMILY CENTRED CARE – WHAT DOES IT MEAN AND WHY PHYSIOTHERAPISTS SHOULD CARE

**Carrington, L.**

*University of Otago*

**Background:** Family-centred care is considered best practice paediatric physiotherapy care, however the specific processes of putting family centred care into action for children with biological, psychological, or social needs are not well explored in the literature, making it difficult for clinicians to apply the principles confidently and consistently.

**Purpose:** This scoping review aimed to synthesise the literature illustrating ways in which family-centred care is implemented for children with biopsychosocial needs and identify outcome measures used in the studies.

**Methods:** A scoping search across seven databases for publications published between 2005 and October 2020 was conducted. A total of 42 studies met the inclusion criteria.

**Results:** Interventions of family-centred care were implemented in diverse ways, evident by the heterogeneity in study populations, methodology and reporting. Health condition or impairment focused outcome measures were standard with few outcomes measuring participation or activity. Practical elements of family centred care were identified included, intervention content, parental support methods, and theoretical concepts such as collaborative decision making, goal setting and individualised programming, from which a framework of key processes was created.

**Conclusion(s):** Key attributes of family-centred care are used inconsistently making standardised implementation difficult. It is unclear whom researchers consistently consider as integral to the 'family unit', and goal setting processes do not always include the child themselves. Outcome measures are strongly focused on health condition, body structure or functional limitations, with a paucity of measures focused on activity, participation, or psychosocial factors.

**Implications:** Paediatric physiotherapists may use this study to identify key attributes of family centred care and the framework to guide their processes of putting family centred care interventions into action for this population of children and their families. Consideration of outcomes meaningful to the child and whānau may lead to exploration of a wider range of holistic measures.

## MĀORI THERAPISTS' PERSPECTIVES OF DEVICE AND PROGRAMME REQUIREMENTS FOR EFFECTIVE UPPER LIMB ROBOTIC REHABILITATION FOLLOWING STROKE

**Charlesworth, K., Barlow, R., Wilson Uluinayau, T., Wilson, B., Alder, G., Shrestha, R., & Signal, N.**

*Auckland University of Technology*

**Background**: For people who have had a stroke, upper limb impairment is common and frequently limits the ability to perform everyday life activities. There is growing interest in the development and implementation of robotic devices to augment rehabilitation for the upper limb following stroke. However, there is limited knowledge about what a robotic device needs to entail to deliver efficacious rehabilitation outcomes, or the delivery methods which might support or hinder their implementation in clinical practice. Given the high prevalence and continued disparities experienced by Māori in access to, and outcomes from, stroke rehabilitation, it is essential that rehabilitation services meet the needs of tangata whenua. Drawing on mātauranga Māori to inform the development and implementation of rehabilitation technologies like robotic devices, may improve stroke rehabilitation outcomes for Māori.

**Purpose:** This research aims to explore Māori clinicians' perspectives of device and programme requirements for effective upper-limb robotic rehabilitation with Māori whānau following stroke.

**Methods:** This research utilised a Māori-centred approach alongside user-centred design principles. The research method was informed by the Meihana Model of Health and the hui process for clinical engagement. Physiotherapists, occupational therapists, and rehabilitation assistants who work in stroke rehabilitation and who identify as Māori were invited to take part in focus groups or interviews to discuss their perspectives. Interviews were audio recorded, transcribed verbatim and inductively analysed using qualitative thematic analysis.

**Results:** In this late breaking presentation the researchers will present preliminary results from six interviews.

**Conclusion:** The findings will shape the development of user requirements to inform the future design and implementation of robotic devices for upper limb stroke rehabilitation which are culturally responsive to the needs of Māori.

**Implications:** Robotic devices are rehabilitation tools which can be utilised to improve function following a stroke. Currently, uptake of robotic devices is low. This research will highlight device design and implementation parameters which are more conducive to supporting engagement in rehabilitation and improving rehabilitation outcomes for Māori.

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## MUSCULOSKELETAL CHEST PAIN PREVALENCE IN EMERGENCY DEPARTMENT PRESENTATIONS: A RETROSPECTIVE CASE NOTES REVIEW

**Dacombe-Bird, M[1]., Dassanayake, S[1]., August, S[2]., Ribeiro, D[1]., Nixon, G[1]., Stokes, T[1]., Wilkins, G[1]., Bryant, K[1]., Beck, S[1]., & Kennedy, E[1].**

*[1]University of Otago; [2]Bodystance Inc, Dunedin*

**Background:** Musculoskeletal causes are described as a common cause of chest pain, yet prevalence data is limited. To improve outcomes for people with musculoskeletal chest pain a greater understanding of this condition is required.

**Purpose:** To estimate the prevalence of suspected musculoskeletal chest pain presenting to Southern District Health Board emergency departments (EDs) through a retrospective case notes review.

**Methods:** Electronic records for people > 16 years presenting to Dunedin, Southland and Lakes EDs with chest pain were extracted for the three-month period 1 March to 31 May 2021. All records with the words 'chest pain' in the triage or diagnosis description were included. Following a procedure manual developed by consensus and refined through piloting on 10% of the sample, records were categorised for chest pain type based on the diagnostic code, departure destination and documented clinical impression.

**Results:** A total of 1420 records were extracted: Dunedin Hospital 674, Lakes District Hospital 113; Southland Hospital 633; Sex male 736 (52%), female 684 (48%). During analysis 122 records were excluded due to the person leaving prior to evaluation, age less than 16, nil chest pain in notes, or no note available. Mean age was 55.0 (SD 19.9) years. Categories for 1298 records were: 115 (9%) acute coronary syndrome; 149 (11%) other cardiac; 23 (2%) psychological; 83 (6%) gastrointestinal; 98 (8%) respiratory; 197 (15%) musculoskeletal; 615 (47%) undifferentiated; 18 (1%) other.

**Conclusion(s):** The findings provide a conservative estimate of the prevalence of suspected musculoskeletal chest pain presenting to New Zealand EDs, consistent with other reported estimates. The high prevalence of undifferentiated chest pain reflects the emergency context where the priority is to exclude potentially serious causes of chest pain.

**Implications:** Chest pain with suspected musculoskeletal causes is common, relative to other causes, and worthy of greater attention beyond excluding serious causes.

## USING REAL-WORLD DATA TO DEVELOP A RESEARCH PROJECT: CASE STUDY FROM ACROSS THE DITCH

**Davidson, S[1,2]., Williams, C[2,3]., Kamper, S[3,4]., & Haskins, R[5].**

*[1]University of Newcastle; [2]Population Health Hunter New England Local Health District; [3]University of Sydney; [4]Nepean Blue Mountains Local Health District; [5]John Hunter Hospital, Australia*

**Background:** Many clinicians are interested in undertaking research but struggle to identify and collect usable data. What clinicians often don't realise is that there is readily available data that can be used to answer important questions and assist with developing innovative solutions.

**Purpose:** To describe how readily available data sources can be used by clinicians to develop real world research projects.

**Methods:** A case study based on a research project looking at improving the management of patients with low back pain (LBP) in the emergency department (ED) will be used to highlight the opportunities available to clinicians. The project used five years of quantitative data from a clinical records audit to describe LBP ED presentations across a health district in New South Wales, Australia. We then collected qualitative data using semi-structured interviews and guided group discussions with ED clinicians (medical officers, nurses and physiotherapists) exploring clinician barriers, enablers and suggestions for how to improve management of patients with LBP.

**Results:** We began with an initial consultation meeting with the ED management team who identified challenges with managing patients with back pain. We analysed quantitative data which showed the significant drain presentations for LBP place on EDs (26,828 presentations, median time in ED 163 min, and 4,911 hospital admissions). This information was then used to secure buy-in from the ED management team to further examine the issue. We interviewed 21 clinicians who identified a range of barriers and enablers to optimal patient care. Based on this information we then worked with clinicians to design potential improvement strategies.

**Conclusion(s)/Implications:** This presentation will highlight the potential data that can be used to inform research within the clinical setting. To do this it will use a real-world example of improving the care of LBP in the ED of a large Australian public hospital.

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## STRATEGIES TO IMPROVE SERVICE LEVEL OUTCOMES FOR LOW BACK PAIN IN THE EMERGENCY DEPARTMENT

**Davidson, S[1,2]., Williams, C[2,3]., Kamper, S[3,4]., Haskins, R[5]., Petkovic, D[5]., Feenan, N[5]., Smith, D[5]., O'Flynn, M[5]., & Pallas, J[5].**

*[1]University of Newcastle; [2]Population Health Hunter New England Local Health District; [3]University of Sydney; [4]Nepean Blue Mountains Local Health District; [5]John Hunter Hospital, Australia*

**Background:** Low back pain (LBP) causes high distress and disability worldwide. LBP is fifth most common reason for presentation to Australian emergency departments (EDs) and managing these patients is a significant challenge for EDs.

**Purpose:** To assess the effect of a suite of co-designed strategies on the flow of patients with LBP through the ED.

**Methods:** An interrupted time series design to assess change in ED service level outcomes. The co-designed strategies were based on pre-identified enablers and barriers to managing LBP presentations in ED. The strategies included: i) a rapid-access follow-up Physiotherapy clinic; ii) an evidence-based, culturally safe patient education resource; iii) an evidence-based education program for ED clinicians (medical officers, nurses, physiotherapists); and iv) a department-specific ED pathway for LBP.

**Results:** Final results will be presented at the conference. Based on a planned interim analysis there were 4,982, 780 and 291 ED presentations before, during and after implementation. The mean age of patients was 50.0 years (SD, 20.1), 53% were female, and 6.3% identified as Aboriginal. 7.1% of patients were referred by their general practitioner, and 73% were triaged as semi- or non-urgent. We observed an increase in the median (Interquartile range) time in ED from 231mins (138–325 min) pre-implementation to 262 (169–356) min after. However, the proportion of patients admitted to the hospital wards decreased from 30% (pre-phase) to 25% (post-phase). The number of patients returning to ED within five days increased from the pre-phase (5.7%) to the post-phase (6.5%).

**Conclusion(s)/Implications:** Based on interim analysis, the strategies trialed may have led to an increase in the time spent in ED and a reduction to inpatient hospital admission rates. Analysis of complete follow up data is underway and will be presented at the conference.

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## MOVING THE WOUNDED HAND: THE ROLE OF SILICONE IN WOUND CARE

**Donaldson, G[1]., Perry, M[2]., & Sole, G[2].**

*[1]Wellhand, Wellington; [2]University of Otago*

**Purpose:** Worldwide use of silicone wound products by physiotherapist's ranges from immersion of hand wounds in silicone oil to clinical trials evaluating the impact of silicone dressings on movement following knee joint replacement. However, the integumentary system and wound care is not taught in the NZ curriculum. Physiotherapists rely on other sources to accumulate evidence-based information. This review aims to summarise the use of silicone products used for upper limb wound care through a therapy lens

**Methods:** The study design used a PRISMA protocol and Boolean search strategy to combine keywords "wound healing" and "silicone" on seven electronic databases. Primary human studies of any design investigating wound care in the upper limb between 1940 till 2021 were included. Studies on intact skin, scar care, and "silicone-plus additive" were excluded.

**Results:** The initial search identified 3,723 publications, with the final review containing 52 studies. An increasing numbers of silicone studies have identified six different forms of silicone frequently used on burn, trauma, surgical, skin graft and skin tear wounds. Nearly 50% of wounds were located on fingers and hands. Three overarching indications for use spanned all silicone wound products, namely facilitating movement, reduction in pain, particularly during dressing changes, and the promotion of wound healing

**Conclusions:** Patients requiring rehabilitation frequently have a wound. Use of silicone products helps align wound care goals with therapy goals which are primarily reduction in pain to regain function and mobility. However, there is currently no recognised funding for physiotherapists to provide wound care.

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## USE OF PHYSIOTHERAPY CLINICAL OUTCOME MEASUREMENT IN TELEREHABILITATION IN NEW ZEALAND: A QUALITATIVE STUDY

**East, G., Joubert, S., Rutter, H., Thompson, A., Shaikh, N., O'Brien, D., Signal, N., Gomes, E., Olsen, S., & Alder, G.**

*Auckland University of Technology*

**Background:** Access to traditional in-person consultation and treatment have been significantly impacted during the COVID-19 pandemic. While research indicates that telerehabilitation is as effective as in-person rehabilitation, there is limited evidence describing "best practice" for physiotherapy clinical assessment during telerehabilitation.

**Purpose:** To explore the experiences and perceptions of New Zealand registered physiotherapists on the use of outcome measures in telerehabilitation.

**Methods:** A qualitative descriptive methodology was used. Semi-structured video interviews were conducted with 21 physiotherapists (Practice area $n = 12$, Musculoskeletal; $n = 9$, Neurorehabilitation) and transcribed verbatim. Data was inductively analysed using a conventional content approach.

**Results:** Planning and preparation for telerehabilitation sessions were deemed crucial. Physiotherapists selected outcome measures for use in telerehabilitation dependent on patient safety, environment, timings of measurement, digital infrastructure, patient literacy, and availability of a support person. Outcome measures were adapted ad-hoc for use in telerehabilitation e.g., oculomotor testing was adapted by getting the client to follow their own finger so eye movements could be observed by the therapist over the screen. Telerehabilitation provided greater understanding of the patients living situation, aiding the development of individualised management plans. However, issues around connectivity, privacy, challenges in establishing new therapeutic relationships and the validity of the modified outcome measures were raised. While the value of therapeutic touch and hand-on practice was emphasised during clinical assessment, alternative methods such as patient reported outcome measures and subjective assessment were preferred to inform clinical reasoning in telerehabilitation.

**Conclusion(s):** This study provides information on modified workflows, use of information and communication technologies, and strategies used to translate physiotherapy assessment skills to telerehabilitation.

**Implications:** An enhanced understanding of telerehabilitation practice provides the groundwork for the adaptation and validation of commonly used outcome measures for telerehabilitation. Development of feasible workflow practices and enhancement of digital health-infrastructure would support effective delivery of telerehabilitation as an adjunct to face-to-face practice.

## DYSFUNCTION OF THE STRESS RESPONSE IN INDIVIDUALS WITH PERSISTENT POST-CONCUSSION SYMPTOMS: A SCOPING REVIEW

**Farrell, G[1]., Wang, S[1]., Chapple, C[1]., Kennedy, E[1]., Gisselman, A[2]., Sampath, K[3]., Cook, C[4]., & Tumilty, S[1].**

*[1]University of Otago; [2] Tufts University, Boston, USA; [3]Waikato Institute of Technology; [4]Duke University, Durham, USA*

**Background:** Ten to fifteen percent of individuals who sustain a concussion develop persistent post-concussion symptoms (PPCS). Preliminary evidence suggests that individuals with PPCS have a dysfunctional stress response, consisting of the autonomic nervous system (ANS) and hypothalamic pituitary adrenal-axis (HPA-axis). In the presence of a stressor, the ANS and HPA-axis work interchangeably to return the body back to homeostasis. It is plausible, with concussion as the initial stressor, that the development and maintenance of PPCS may be due to a dysfunctional stress response.

**Purpose:** Individually map the literature surrounding quantifiable changes of the ANS and HPA-axis to explore the extent of evidence for dysfunction of the stress response in individuals with PPCS.

**Methods:** Information sources were searched in June and October 2021. Studies were included if their population was classified with PPCS, and their study stated at least one quantifiable marker of the ANS or HPA-axis using non-invasive and clinical tools. Relevant studies were screened, and data was extracted.

**Results:** Thirty-seven articles were included in this scoping review. Most studies assessed quantifiable markers of the ANS ($n = 34$) in comparison to the HPA-axis ($n = 2$) and stress response ($n = 1$) (ANS and HPA-axis). The most common quantifiable markers of the ANS included heart rate ($n = 20$), blood pressure ($n = 16$), and heart rate variability ($n = 10$). Cortisol was the only included quantifiable marker of the HPA-axis ($n = 2$).

**Conclusion(s):** Evidence presented in this review supports quantifiable dysfunction of the ANS in individuals with PPCS. Further research is required investigating quantifiable dysfunction of the HPA-axis, and peripheral stress response (ANS and HPA-axis), in individuals with PPCS.

**Implications:** Understanding the role, and how to measure objectively and pragmatically, a dysfunctional stress response will help clinicians tailor more effective treatment pathways for individuals with PPCS.

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## A SUB-MAXIMAL EXERCISE TEST TO PREDICT AEROBIC FITNESS USING RATINGS OF PERCEIVED EXERTION IN CANCER SUFFERERS TAKING BETA-BLOCKERS

**Farrell, S[1,2]., Mawston, G[1]., Bigwood, B[2]., Sangamnerkar, G[2]., & Harison, I[2].**

*[1]Auckland University of Technology; [2]Wellington District Health Board*

**Background:** Aerobic fitness (peak oxygen consumption (VO2) and anaerobic threshold (AT)) is an important measure for risk stratification and exercise prescription in cancer patients undergoing major abdominal surgery. To date there is no submaximal test that can be used by physiotherapists to accurately predict aerobic fitness these patients who take beta-blocker medication.

**Purpose:** To determine whether ratings of perceived exertion (RPE) during a graded exercise test could provide an estimate of aerobic fitness in patients with abdominal cancer taking beta-blocker medication.

**Methods:** Fourteen participants (mean age = 75 years) with abdominal cancer taking beta-blocker medication were age-matched to a similar group of cancer patients not taking any heart altering medication. Participants performed a cardiopulmonary exercise test where AT and VO2 peak were identified. RPE was recorded every minute throughout the test. Regression analysis was performed between workload at an RPE of 13 and actual VO2 peak, and intraclass correlation coefficients (ICCs) were then calculated for the predicted versus actual VO2 peak.

**Results:** The beta-blocker group displayed significantly lower heart rates at AT and VO2 peak than the control group ($p < 0.05$). However, VO2 and workload at AT and peak exercise did not differ between groups. Workload per kilogram of body weight at an RPE of 13 (somewhat hard) was a good predictor ($R^2 = 0.67$) of VO2 peak, with the ICC between actual and predicted VO2 peak being 0.82.

**Conclusion(s):** Workload attained at a RPE of 13 provided an accurate measure of aerobic fitness in patients with abdominal cancer taking beta-blocker medication.

**Implications:** A clinical exercise test using RPE provides a good estimate of aerobic fitness in abdominal cancer patients taking beta-blockers and has the potential to be used for risk stratification and exercise prescription in this population.

## PERSPECTIVES OF NEW ZEALAND PHYSIOTHERAPISTS ON REHABILITATION AND RETURN TO SPORT FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

**Fausett, W[1]., Reid, D., & Larmer, P.**

*Auckland University of Technology*

**Background:** Previous research has highlighted variability in the beliefs and practices of physiotherapists regarding rehabilitation following anterior cruciate ligament reconstruction (ACLR). Post-operative rehabilitation following ACLR in New Zealand (NZ) is typically managed by physiotherapists. However, the beliefs and practices of NZ physiotherapists regarding ACLR rehabilitation are currently unknown.

**Purpose:** To investigate the beliefs and practices of New Zealand physiotherapists regarding pre- and post-surgical rehabilitation and return to sport (RTS) criteria following ACLR.

**Methods:** A survey was adapted from a previously published survey and disseminated online to NZ physiotherapists who were considered more likely to be involved in ACLR rehabilitation.

**Results:** The number of completed surveys was 318. Most physiotherapists (85%) preferred to first consult patients within 14 days of ACLR. In the first six weeks following ACLR, 89% of physiotherapists would see patients at least once per week. Between 3- and 6-months post-ACLR, 76% of physiotherapists would see patients at least once a fortnight. Pre-operative rehabilitation and post-operative rehabilitation exceeding six months are considered essential or important to patient outcomes by over 95% of physiotherapists. While 63% of physiotherapists support a RTS 9-12 months after ACLR, 11% permit a RTS within 6-9 months of surgery. Common RTS considerations include functional capacity, movement quality during functional tasks, time from ACLR, and knee strength.

**Conclusion(s):** The need for pre-and post-ACLR rehabilitation is well recognised amongst NZ physiotherapists. Although the majority of respondents report practice beliefs consistent with current recommendations, those beliefs are not always consistent with clinical practice.

**Implications:** To maximise the likelihood of an optimal outcome, physiotherapists should ensure ACLR patients receive an appropriate dosage of pre- and post-surgical rehabilitation. ACLR rehabilitation that does not follow best practice recommendations could negatively influence patient outcomes.

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## PREDICTIVE FACTORS ASSOCIATED WITH OUTCOMES FOR LOW BACK PAIN PATIENTS MANAGED WITHIN AN ESCALATED CARE PATHWAY

**Ford, R., Kenny, D., Condliffe, J., & Gregg, C.**

*TBI Health Group*

**Background:** The social and economic cost of chronic low back pain (CLBP) is substantial and represent a significant component of the overall burden of musculoskeletal disability within our society. More recently, there has been increased attention on identifying patients at a higher risk of developing long term chronicity and intervening early with a more intensive multidisciplinary approach.

Here in New Zealand, ACC has been working with rehabilitation groups to co-design and trial this new approach with the implementation of escalated care pathways (ECP). This study reviews the outcomes achieved for LBP patients managed within an ECP environment and identifies potential predictive factors associated with the outcomes achieved.

**Purpose:** To determine the association between potential predictive variables and clinically relevant outcomes for a cohort of LBP patient that completed an ECP.

**Methods:** This was an observational study of patients with persistent LBP referred to an ECP over a 24–month period. A range of demographic, symptomatic and psychosocial variables were recorded at assessment. In addition, measures were recorded for pain (Numeric Pain Score [NPS]), Disability (Oswestry Disability Index [ODI]) and work status (working/not working) at assessment, discharge and 12–month follow ups. Multivariate logistic regression analysis was used to model the relationship between the potential predictive variables and the independent variables measured.

**Results:** The ECP cohort consisted of 256 patients with an average age of 43.4 years. The group reported a 3.1/10-point improvement in mean NPS and 26/100 improvement in mean ODI score. 81.4% of patients returned to their full pre-injury hours at the end of the pathway and 12.9% returned to work on partial hours or modified duties.

**Conclusion:** The predictive variables most strongly associated with a positive outcome were symptom duration and the assessment Orebro score. Patients seen early after their injury and those with relatively lower levels of psychosocial distress achieved better overall results within an ECP pathway.

**Implications:** ECP are in important development in the management of musculoskeletal injury in New Zealand. This initial pilot for patients with LBP has shown positive results, but further research is required to determine the most appropriate client profile to benefit from this approach.

## STRENGTH TRAINING AS TREATMENT FOR LOW BACK PAIN: A SCOPING REVIEW

**Gibbs, B[1]., Davidson, S[1,2]., Gleadhill, C[1]., Viana da Silva, P[1,2]., Rice, A[2]., Robson, E[1,2]., Muddle, R[4]., & Williams, C[2,3].**

*[1]University of Newcastle; [2]Population Health Hunter New England Local Health District; [3]University of Sydney; [4]RSL Aged Care, Australia*

**Background:** Low back pain (LBP) is the leading cause of disability worldwide. International LBP treatment guidelines are evolving to place more emphasis on active rehabilitation such as strength training rather than passive therapies, pharmaceuticals, and invasive procedures. With this shift, clarity around active rehabilitation parameters is necessary to support health professionals and patients alike to integrate this change.

**Purpose:** To summarise the existing evidence relating to strength training as a treatment for low back pain.

**Methods:** We conducted a scoping review to identify the existing evidence for strength training for LBP. We searched five online databases (MEDLINE (Ovid), EMBASE (Ovid), PsychINFO (Ovid), CINAHL (EbscoHost) and Cochrane Library (Wiley)) from inception to September 2020. We included randomised controlled trials that used strength training in their intervention to treat non-specific low back pain of any duration.

**Results**: Forty studies were eligible for inclusion. There was a large variety in characteristics. Strength training principles (e.g. overload, type, specificity and duration) were mentioned in the majority of studies but not explored in depth. Exercise descriptions and dosage were poorly reported (mean Consensus on Exercise Reporting Template score: 53.6%). The majority of studies did not specify how dosage was determined (35%), with almost a quarter (22%) being generic for all participants. The majority of strength training was delivered using machines (51.9%)

**Conclusion(s):** We found the literature investigating strength training as a treatment for LBP to be poorly reported and lacking program specifics. Future research needs to better explain mechanisms, principles, dosage and better report their interventions.

**Implications:** The lack of clarity around strength training treatment protocols may result in an inability for clinicians to reproduce treatment protocols clinically. With the growing evidence to support strength treatment for LBP, this may have a negative impact on patient outcomes.

## FACILITATING STUDENT LEARNING OF SUPPORTED SELF-MANAGEMENT IN HEALTHCARE PRACTICE

**Gudgeon, M[1]., McConnell, L[1]., Wilkinson, A[2]., & Hale, L[2].**

*[1]Capital and Coast District Health Board, [2]University of Otago*

**Background:** Individuals self-manage lifelong conditions daily with episodic support provided by healthcare professionals. Supported self-management (SSM) facilitates the skills required by an individual to self-manage their condition and live well. Learning about SSM should be in healthcare professional programme curricular. Little is known about how SSM is currently taught or perceptions and attitudes students hold about SSM.

**Purpose:** Our study aimed to (1) explore healthcare professional students' perceptions and attitudes to SSM and (2) co-design with physiotherapy students how best to teach SSM to enable engagement and optimise learning.

**Methods:** Survey, qualitative and co-design methodologies were used. Healthcare professional students' perceptions and attitudes were explored via e-survey and semi-structured interviews. Then, physiotherapy students participated in a Nominal Group Session and a multi-stage E-Delphi survey.

**Results:** E-survey (*n* = 96; 11 programmes) and interview (*n* = 10; 8 programmes) data suggested students hold positive attitudes about SSM, had perceived confidence to provide SSM, but limited opportunities to implement in clinical environments. Corroborating key themes were "Self-management support is puzzling" indicating uncertainty about specific roles and actions required within patient interactions and "Self-management support is valuable". Consensus from physiotherapy students was that learning SMS should be frequent, interesting, explicit, and incorporated across all years of training. Practical opportunities were favoured over theoretical learning, such as providing SSM to individuals living with lifelong conditions during clinical placements. Learning SSM was considered as on-going, important to providing person-centred care and in improving health outcomes.

**Conclusion(s):** Healthcare professional students realise that SSM is important in healthcare and that while knowledge is important, learning how to provide SSM in clinical situations is crucial.

**Implications:** More explicit and frequent learning opportunities need to be provided in real-life settings for physiotherapy students to learn "how to" support patient self-management. Good role modelling of SSM by qualified physiotherapists is equally important.

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## WE DO IT BEST: MANAGING LOW BACK PAIN PATIENTS IN AN EMERGENCY DEPARTMENT SETTING

**Gutschlag, F.**

*Emergency Department, Whakatane Hospital, Bay of Plenty District Health Board*

**Background:** In 2020 physiotherapists began working in the emergency department (ED) of Tauranga Hospital as first contact practitioners. This was a targeted initiative in response to the high number of hospital admissions of patients with low back pain (LBP)

**Purpose:** The purpose of this study is to examine if musculoskeletal (MSK) physiotherapy intervention in the assessment, diagnosis and overall management of patients with LBP presenting to ED is a viable, effective and successful way of reducing hospital admissions of this patient population.

**Methods:** A real time data dashboard was developed and used to capture measures of LBP patient outcomes and physiotherapy interventions.

**Results:** At the time of writing, definitive data is unavailable (due to COVID-19 staff redeployment) however interim data shows that the primary goal of reduced hospital admissions for LBP patients via ED has been achieved. Other outcomes of note included: decreased patient wait and overall time spent in ED, a change in management strategies away from diagnostic imaging and specialist intervention towards a focus on patient education, enablement and engagement with onward referral to physiotherapy colleagues in the community on discharge.

**Conclusion:** Implementation of a MSK physiotherapy service within Tauranga Hospital's ED was successful in decreasing hospital admissions for LBP patients. This demonstrates that physiotherapists have highly relevant knowledge and expert skills in the assessment, diagnosis and management of LBP and are the most appropriate profession to be the primary contact practitioner in patients presenting with LBP in a hospital ED setting.

**Implications:** Physiotherapy should be utilised more in an ED setting in order to reduce hospital admissions and facilitate optimal management of patients presenting with LBP. In a bigger picture scenario, MSK physiotherapists working in an ED setting are promoting and advancing the profession within DHBs and the communities they service

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## IMPLEMENTATION OF A LIFESTYLE PROGRAMME FOR PEOPLE LIVING WITH TYPE 2 DIABETES: LESSONS LEARNT

**Hale, L., Higgs, C., Stokes, T., Wilkinson, A., Jayakaran, P., Keen, D., Mani, R., Sullivan, T., Gray, A., Doolan-Noble, F., & Mann, J.**

*University of Otago*

**Background:** We developed and investigated the Diabetes Community Exercise and Education Programme (DCEP); a physiotherapy and nurse led lifestyle programme for adults with type 2 diabetes inclusive for Māori and Pacifika people and those living in low socioeconomic circumstances.

**Purpose:** We report the achievements and challenges of implementing DCEP into a community-based setting.

**Methods:** This qualitative study was embedded in a randomised controlled trial. Informed by the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) Framework, we collected data via semi-structured interviews with DCEP attendees ($n$ = 17) and involved healthcare professionals (HCPs) ($n$ = 18) and thematically analysed it.

**Results:** We achieved our *Reach* target (sample size, ethnic representation) but could have extended further with use of community champions and promoting self-referral. The randomisation process was discouraging to Māori and Pasifika participation. DCEP was perceived *Effective* as the social relaxed environment and relationships forged between both attendees and HCPs facilitated attendance and all spoke of derived benefits. The person-centred approach of the HCPs was appreciated. Although time-consuming, development of trusting relationships with local health providers and the wider community enabled *Implementation* and *Adoption*. To perpetuate *Maintenance* participants considered that generic, not health condition specific, programmes delivered closer to home were preferable.

**Conclusion(s):** Implementation of lifestyle programmes require inclusive involvement of target populations and their wider communities. Thus, preparation is required focussing on building trusting relationships within the community and understanding local context and needs. Involved HCPs need training in person-centred approaches to enable a supportive, empowering setting.

**Implications:** Physiotherapy has a crucial role in enabling health and wellness of people with long-term health conditions and provision of lifestyle programmes such as DCEP encouraged. In doing so, physiotherapists must be mindful of relationship development and working in a supportive collaborative way both with class attendees and their community. Such an approach takes time to develop.

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## IMPACT OF PERSON-CENTRED CARE ON DELIVERY OF THE DIABETES COMMUNITY EXERCISE PROGRAMME (DCEP)

**Higgs, C., Hale, L., Keen, D., & Smith, C.**

*University of Otago*

**Background:** Exercise is a core foundation of successful self-management of type 2 diabetes (T2D). DCEP is an exercise and education rehabilitation programme aimed at supporting adults living with T2D to take control of their health and to live well. It was developed to enhance the self-efficacy of people to engage in exercise for a long term and is underpinned by the spirit of motivational interviewing.

**Purpose:** This study explored what DCEP attendees and health care professionals (HCPs) who delivered the programme perceived DCEP to be and what motivated attendance. This furthers the understanding of what rehabilitation programme ingredients are important to support people with T2D to engage in regular exercise.

**Methods:** This qualitative study interviewed 17 DCEP attendees and 12 HCPs, who delivered DCEP. These interviews occurred at the completion of the twice-weekly, 12–week education and exercise programme prior to attendees commencing an ongoing twice-weekly maintenance exercise class. Interviews were audio-recorded, transcribed verbatim and analysed with the General Inductive Approach.

**Results:** *Person-centred care* was a key theme constructed from the analysis. *Person-centred care* comprised of four subthemes: monitoring, individualised exercise within a sociable group setting, flexible education and discussion, and HCP training.

**Conclusion(s):** DCEP motivated people with T2D to engage in exercise. An emphasis on a person-centred care approach that supported health monitoring and educational and social aspects of the programme was important to this engagement. HCPs who were comfortable to guide attendees through the programme in this person-centred way were imperative to successful delivery.

**Implications:** (1) Physiotherapists' and other HCPs' ability to communicate with and support their clients in a person-centred way impacts their commitment to engage with rehabilitation programmes; (2) Person-centred care within group rehabilitation programmes required both structured health monitoring and an openness to deliver exercise and education in flexible and social ways.

## A SCOPING REVIEW OF GUIDELINES AND PATHWAYS FOR MANAGING LOW BACK PAIN IN NEW ZEALAND

**Hill, J[1]., Ellis, R., Caswell, M[2]., & Chapple, C[2].**

*[1]Auckland University of Technology; [2]University of Otago*

**Background:** Low back pain (LBP) is commonly treated by physiotherapists in New Zealand (NZ) affecting people across their lifespan from childhood through to old age. Health practitioners use a broad spectrum of approaches to manage people with acute LBP, possibly referring to guidelines and pathways. One such approach is stepped-care based on duration of symptoms, response to treatment, and psychosocial factors. It is unclear which guidelines and pathways are used in NZ to direct management of people with acute LBP.

**Purpose:** Identify which guidelines and pathways are used in New Zealand for the management of acute LBP.

**Methods:** A scoping review of peer-reviewed and grey literature was undertaken in August 2021. Eligibility criteria included pathways, guidelines, and webpages for managing people with acute LBP directed at NZ health practitioners in primary care. Data extracted were management recommendations, and implementation strategies.

**Results:** Twenty-eight publications were included; 15 peer-reviewed publications identified 25 guidelines/pathways and 13 grey-literature publications identified 9 pathways available in NZ. Professions utilising these included physiotherapists, GPs, and nurses. Most guidelines provided similar recommendations for management of acute LBP: stay active, graduated activity/exercise program, manage pain and manual therapy. Few considered implementation strategies.

**Conclusion:** Multiple care pathways and guidelines are available in New Zealand. Implementation of these is rarely addressed.

**Implications:** Multiple pathways for management of acute LBP are confusing for health practitioners and patients and could lead to sub-optimal care not conforming to best practice. Further work is necessary to streamline acute LBP care in NZ.

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## WHERE DO NEW ZEALANDERS WITH LOW BACK PAIN SEEK HEALTHCARE?

**Hill, J[1]., Kay, D[1]., Gordon, J[1]., Saywell, N[1]., & Khan Niazi, I[1,2,3].**

*[1]Auckland University of Technology; [2]Aalborg University, Denmark; [3]New Zealand College of Chiropractic*

**Background:** In 2019, almost 500,000 New Zealanders were affected by low back pain (LBP). Accident Compensation Corporation (ACC) fund a significant proportion of those claims, but which services are they funding?

**Purpose:** To determine the healthcare services funded by ACC for people with LBP and determine the costs, trends over time and differences by ethnicity and sex.

**Methods:** A retrospective audit and descriptive analysis (2009–2020) was undertaken, of ACC-funded LBP healthcare service. An *a priori* decision was made to analyse the five most used healthcare services. Four additional healthcare services were included in a secondary exploratory analysis.

**Results:** The five most accessed services were physiotherapy, acupuncture, osteopathy, general practitioner (GP) and chiropractic. Four additional services selected were surgery, radiology, return to work and pain management. There were 3.3 million ACC-funded LBP claims with overall costs of NZ$4 billion. Cost of services was 72% higher for males than females (2020). Europeans made 69% of the claims, (72% of the cost) while Māori made 10% of the claims (13% of cost). European claimants used physiotherapy most frequently, Māori and Pasifika their GP, and Asian claimants, acupuncture.

**Conclusions:** This NZ data differed from international trends, showing relatively more claims for physiotherapy than GP possibly because New Zealand legislation allows patients direct access to physiotherapy.

**Implications:** Physiotherapists remain the primary providers of care for LBP, so we need to make sure we are providing evidenced based treatment. We need to ensure we are following guidelines for referral to radiology. This high-cost service is overused, frequently inappropriately. We need to look at why Māori and Pasifika are not accessing physiotherapy services directly.

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## OUTCOMES OF IN-HOME STRENGTH AND BALANCE FALLS PREVENTION PROGRAMME

**King, J., Butterworth, P., Buragadda, P., Gregg, C., McDonald, R., & Kenny, D.**

*TBI Health Group*

**Background:** Falls are very common in the elderly population and can frequently result in hospitalisation and/or fractures. Falls negatively impact the health, wellbeing, and independence of an individual and there are significant health costs for our communities in supporting people who incur a fall related injury.

The Otago Exercise Programme (OEP) is an evidence based, semi-structured, in-home based exercise program, consisting of a series of home visits extended over six months. It is led by a physiotherapist or trained health professional and has been adapted and introduced by a select number of DHBs across New Zealand as a preventative initiative to reduce the rate and risk of falls within our society.

**Method:** A retrospective, observational audit of 994 programme participants. Inclusion criteria: Māori and Pacific people aged 65 years and over, and all other adults aged 75 years and over living in the WDHB and ADHB community who are identified to be 'at risk' of a fall and are referred to TBI Health for the In-Home Strength and Balance prevention programme. Study period: All clients referred to TBI Health from July 2018 to 30 June 2019.

**Results:**

| Outcome measure | Initial | Discharge |
|---|---|---|
| Timed Up and Go (seconds) | 25.35 | 24.73 |
| Chair Stand Test (completed tasks) | 3.82 | 5.52 |
| Four Test Balance – tandem level | 18.2% | 26.5% |
| Modified Functional Efficacy Score | 6.90 | 7.67 |
| Number of falls in previous 3 months | 1.25 | 0.35 |

**Conclusions:** The In-Home Strength and Balance Falls prevention programme has been effective in improving average confidence and functional levels, perceived disability and reducing the number of falls for Waitematā and Auckland DHB participants. A 72% reduction in falls suggests that the In-Home Strength and Balance Falls Prevention Programme has had a positive impact on reducing potential harm of at-risk participants.

**Implications:** The continued body of evidence for a DHB wide Falls Prevention programme demonstrates the need and effectiveness of a low cost, high benefit prevention programme to our most vulnerable population group. Further studies would benefit from reviewing the longitudinal data and impact this has on this cohort.

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## PRACTICAL APPLICATION OF INJURY SURVEILLANCE IN AN ELITE DOMESTIC WOMEN'S CRICKET SQUAD

**Longhurst, R.**

*High Performance Sport New Zealand*

**Background:** Working in sports physiotherapy it is imperative that we utilise research to inform and shape our practice. Alongside academia, well planned data collection within sports team and/or organisations helps to ensure learnings are relevant and fit for purpose for target cohorts.

**Purpose:** To ascertain injury epidemiology for an elite Domestic Women's cricket team.

**Methods:** A retrospective observational cohort study was undertaken on 19 members of the Auckland Hearts Elite Women's cricket team, aged 16–34. Dependent variables collected; injury, training availability and time loss. An injury was defined as: Any impairment (physical or neuromuscular) that results in the inability to complete a training session or competition event at an expected or predetermined level. Significant injuries incurred time loss from selection. Each injury was coded with an OSICS-10 classification. Data was collected between September 2020 and February 2021.

**Results:** 26 injuries were sustained. 10 injuries were significant with 532 days lost. Injury profile differed from that reported in previous literature. Time loss was greatest for shoulder injuries (294 days [59% of time lost]) and neurological conditions were the injury type that resulted in the most time lost (28%).

**Conclusion(s):** The epidemiological data collected differed from published research on male and female cricketers. This targeted the injury mitigation strategies ensuring they were fit for purpose for the cohort.

**Implications:** Practitioners have a role to play in growing the body of research in sports medicine. Simple methods of data collection from practitioners can help target injury mitigation strategies.

## THREE SHADES OF GREEN. UNDERSTANDING INJURY PREVALENCE AND BURDEN IN ELITE NEW ZEALAND ATHLETES

**Longhurst, R.**, & **Scott, J.**

*High Performance Sport New Zealand*

**Background:** Athletes that train unrestricted for more than 80% of the time are more likely to reach their performance goals. The first step in managing injury risk, is to understand injury prevalence and the burden (time lost to full training) that this has on a sport/athlete.

**Purpose:** Health is a performance advantage. By having more athletes training fully more of the time the HPSNZ Performance Health Team can help athletes perform on the world stage.

**Aim:** Understanding the injury burden to sport is the essential first step in mitigating and reducing injury risk. The High Performance Sport NZ Performance Physiotherapy team developed a system to capture athletes' training and competition availability due to injury.

**Methods:** A two-fold approach was instigated. Firstly, the incumbent red-amber-green traffic light system to capture athlete capacity, was updated to include three shades of green to better capture restriction to training in the return from injury. Secondly, any injury resulting in an athlete not being available for selection and the time lost to injury was recorded. Performance physiotherapists worked collaboratively to develop systems that allowed comparisons across and between athletes from various sports.

**Results:** The performance physiotherapy team collected athlete capacity over three years for eleven sports. Athletes identified as being unavailable to train were discussed each week in an inter-disciplinary nation-wide meeting to ensure outcomes were being optimised. This data was used by performance physiotherapists to promote health as a performance advantage and to shape injury risk mitigation programmes within sports.

**Conclusion(s):** To truly understand the impact that injuries have on sport and athletic performance, injury surveillance needs to include data on days lost to unrestricted training and days lost for availability for selection. This data helps guide interventions and resource allocation to ensure that performance physiotherapy is effective and efficient and, ultimately, optimises athletic performance.

## CAM WE DO IT? – USE OF COUGH ASSIST MACHINES IN AN ACUTE SETTING

**Maharaj, V.**

*Capital and Coast District Health Board*

**Background:** Inadequate ventilation, retained secretions and an ineffective cough are significant concerns in patients with respiratory compromise. Lung volume recruitment and cough augmentation are utilised by physiotherapists that include the use of cough assist machines (CAM) providing intermittent positive pressure breathing or mechanical insufflation-exsufflation (MI:E). Capital and Coast District Health Board physiotherapy have a competency assurance programme providing training and upskilling in CAM use; however, anecdotal evidence suggested variation in physiotherapy practise.

**Purpose:** An audit was carried out to review current physiotherapy practice on CAM use in an inpatient setting at Wellington Regional Hospital.

**Methods:** CAMs use was recorded when a physiotherapist initiated CAM therapy. Patients' clinical information were reviewed for relevant indications, contraindications/precautions and CAM application settings against clinical criteria. A questionnaire was also completed by the prescribing physiotherapists to determine confidence in their prescription of CAM and clinical experience.

**Results:** On 25 occasions that CAM was selected, 20 occasions showed clear clinical indications. Of those, only 17 occasions achieved clinically therapeutic settings. When CAM were indicated and prescribed appropriately, 13 occasions achieved favourable outcomes. This meant when a CAM was selected for acute respiratory therapy, 52% of the time (13 out of 25 occasions) the physiotherapist achieved their intended outcome. When outcomes were evaluated against the experience of the physiotherapist, there were correlations of favourable outcomes with clinicians with more experience (> 3 years) compared to less experience (< 3 years). This was similar with the confidence of the physiotherapists.

**Conclusions:** Patient outcomes as a result of CAM use are underwhelming with roughly half of patients who are prescribed IPPB or MI:E achieving therapeutic value; however, the more experienced and confident physiotherapist lead to more favourable outcomes.

**Implications:** Improved guidance for physiotherapist on appropriate selection of IPPB and MI:E in acute settings with emphasis on therapeutic CAM settings. This can be incorporated into current training as well as having a referring guideline aimed at improving patient outcomes.

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## LEARNINGS ON THE USE OF TELEHEALTH TO DELIVER A MULTIDISCIPLINARY OSTEOARTHRITIS OPTIMISATION PATHWAY DURING COVID LOCKDOWN

**Matteucci, L., Naik, L., & Edward, R.**

*Waitematā District Health Board*

**Background:** The intermittent surges in COVID variants and resultant lockdowns have altered how health practitioners deliver services. The telehealth platform has been advocated as an option to become COVID responsive. The practical aspects of delivering and receiving telehealth service needs to be explored.

**Purpose:** To evaluate whether telehealth was effective in delivering patient education and treatment during a six-month pilot for an osteoarthritis (OA) optimisation programme at Waitematā District Health Board.

**Methods:** A retrospective review of the telehealth delivery to patients who engaged in the OA optimisation pathway was conducted. Patients were booked with a physiotherapist and/or dietitian via zoom or telephone consults. Patients were assessed and treated through these modalities either individually or in groups to provide education and self-management strategies. Patient reported outcomes (Knee injury and Osteoarthritis Outcomes Survey – KOOS; Knee Osteoarthritis Knowledge survey – KOAK; and dietetics survey) were uploaded electronically. Data from satisfaction surveys was analysed to identify whether telehealth delivery met patient's healthcare needs.

**Results:** All participants of the pathway showed an improvement in their knowledge of OA with a larger improvement in those that used zoom compared to telephone. 59% of patients engaged with telephone compared to 41% via zoom and these clients showed larger improvements in KOOS scores. There was a 100% positive response from the 19 patients who completed the satisfaction survey question exploring if telehealth met patient needs during lockdown.

**Conclusion:** Telehealth met the patient's needs and expectations during lockdown and improvements in all outcome measures were demonstrated.

**Implications:** Clients are more willing to accept a telehealth mode of delivery as their primary treatment/contact during COVID lockdown and our results reflect that it can be an effective method of delivering education and exercise. An extension of this mode of delivery should be considered for the appropriate cohort of patients in the absence of COVID limitations.

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## NAVIGATING THE VIRTUAL WORLD: RELIABILITY OF THE TRIANGLE COMPLETION TEST IN THE REAL-WORLD AND IN VIRTUAL REALITY

**Mclaren, R., Chaudhary S., Rashid U., Ravindran S., & Taylor, D.**

*Auckland University of Technology*

**Background:** Autonomous spatial navigation is a complex cognitive skill fundamental to independence. The triangle completion test has been used to assess egocentric spatial navigation for decades, yet there is little information on its reliability. We developed a virtual reality (VR) based test and investigated whether either test of spatial navigation was reliable.

**Purpose:** To examine test-retest reliability of the real-world and VR triangle completion tests. A secondary objective was to examine the usability of the VR based test.

**Methods:** 30 healthy adults aged 18–45 years were recruited to this block randomised study. Participants completed two sessions of triangle completion tests in the real-world and VR on the same day with a break between sessions.

**Results:** In both test versions distance from the end-point and angle of deviation showed poor test-retest reliability ($r < 0.5$). Distance traveled had moderate reliability in both the real-world and VR tests ($r = 0.55$ 95% CI [0.23, 0.76]; $r = 0.66$ 95% CI [0.4, 0.83 respectively]). The VR triangle test showed poor correlation with the real-world test.

**Conclusions:** The triangle completion test has poor test-retest reliability and demonstrates poor concurrent validity between the real-world and VR. Nevertheless, it was feasible to translate a real-world test of spatial navigation into VR.

**Implications:** VR provides opportunities for development of clinically relevant spatial navigation tests in the future.

## THE EXPERIENCES OF PHYSIOTHERAPISTS WORKING THROUGH COVID-19 LOCKDOWNS IN AOTEAROA NEW ZEALAND

**Mepham, J[1]., Eastwood, B[1,3]., Goh, P[2]., & Skinner, M[1,2].**

*[1]PNZ Cardiorespiratory Special Interest Group; [2]University of Otago; [3]Bay of Plenty District Health Board*

**Background:** COVID-19 needs no introduction. A national lockdown was first in March 2020. Initially protective personal equipment (PPE) was in short supply. National guidance and local practice failed to consider physiotherapists' role in COVID-19 management. Physiotherapists in private practice were not considered to be essential workers so face-to-face contact largely transitioned to telehealth services. The PNZ Cardiorespiratory Special Interest Group has been actively involved in advocacy, education, consultation and importantly considering the effect the pandemic and lockdowns have had on physiotherapists.

**Purpose:** To investigate the experiences of physiotherapists working through the initial COVID-19 lockdowns in Aotearoa New Zealand.

**Methods:** A cross-sectional study design using a self-completed online questionnaire was distributed to physiotherapist members via PNZ in March 2021.

**Results:** Access to PPE and mask-fit testing was inconsistent during the first lockdown but improved during the Auckland-based August lockdown. There was a lack of understanding of physiotherapists' skill set and role in COVID-19 management. Physiotherapists reported having to justify their need for PPE to other staff. Some physiotherapists needed to justify their PPE choice to leadership within physiotherapy/allied health teams. Physiotherapists in both private and public sectors reported symptoms associated with stress and anxiety. Stressors ranged from inadequate PPE while treating patients at-risk/positive for COVID-19 to loss of income.

**Conclusion(s):** More can be done to highlight the value of physiotherapy in COVID-19 management; utilise the skills of physiotherapists across the patient journey and in pandemic planning. Access to PPE and appropriate mask-fit testing is essential for workplace health and safety. The pandemic and lockdowns in 2020 impacted on the wellbeing of physiotherapists across all sectors.

**Implications:** Physiotherapists' role needs to be better understood across tertiary to community sectors both to improve collaboration with the wider health workforce for future pandemic management and to enhance workplace safety for those with face-to-face contact.

## SERVICE AUDIT OF OPTIMISATION OF NON-SURGICAL INTERVENTION FOR OSTEOARTHRITIC KNEE PATIENTS AT WAITEMATĀ DHB

**Naik, L., Matteucci, L., & Edward, R.**

*Waitematā District Health Board*

**Background**: Osteoarthritis (OA) is a highly prevalent disabling condition expected to rise in the future. Arthritis New Zealand estimates that the cost of managing OA in 2018 was $12.2 billion. Surgical and pharmacological interventions appear to supersede evidence-based guidelines advocating conservative options.

**Purpose:** To optimise conservative treatment options for OA knee patients, referred to the Waitematā District Health Board (DHB) orthopaedic service.

**Methods**: An initial six-month pilot was implemented to optimise conservative treatment for moderate to severe OA knee patients referred to the orthopaedic service. Patients received an assessment, education, and exercise sessions with a physiotherapist and/or dietitian delivered via telehealth due to COVID restrictions. Process reported outcome measures assessed referral patterns and outcomes from the pathway. Patient-reported outcome measures (NPRS, KOOS, KOAK, Dietitian questionnaire) were also used to qualify pain, quality of life, impact on function, and dietary habits pre and post pathway.

**Results:** During the six months from June-December 2021, 83 patients have participated in the OA knee pathway. Three were discharged from orthopaedics, and two were offered SOS on the orthopaedic list. Out of the patients who completed KOAK post-pathway 100% demonstrated an improvement in the knowledge of OA. 52% of participants who completed the KOOS showed an improvement across the sub-scales, and 59% showed improvement in pain rating. Small amounts of weight loss were noted by a few patients with variations from 1 kg to 10kg.

**Conclusion:** The findings from our OA optimisation pathway are encouraging despite the short time duration of the pathway, a small cohort of patients, and an alteration of the traditional model of health care delivery to telehealth to be COVID responsive.

**Implications:** These results show that optimising conservative management even in moderate to severe OA can improve function and symptoms and should be instituted as a first-line treatment prior to considering surgical options.

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## THE GAIT&BALANCE APP: A MOBILE SOLUTION FOR ASSESSING BALANCE

**Olsen, S[1]., Rashid, U[1]., Alder, G[1]., Barbado, D[2]., Allerby, C[1]., Brown, E[1]., Leyser, M[1]., McDonnell, G[1]., López Elvira, J[2]., Lord, S[1]., Niazi, I[3]., & Taylor, D[1].**

*[1]Auckland University of Technology; [2]Miguel Hernandez University of Elche, Spain; [3]New Zealand College of Chiropractic*

**Background:** Physiotherapists commonly use balance tests that rely on visual observation and a stopwatch. Such tests can be limited in their accuracy, repeatability, and sensitivity, and can be subject to ceiling effects. Force-plate technology, 3D motion capture, or instrumented walkways are accurate, yet most physiotherapists do not have access to such expensive technology. Here we present the 'Gait&Balance App', a new tool which has potential to provide physiotherapists with a fast, accurate, and affordable method for measuring balance. It works on a standard smartphone using the accelerometers embedded within the smartphone to objectively evaluate balance and gait parameters.

**Purpose:** To report the results of initial research investigating the validity of the Gait&Balance App against gold-standard measures and clinical balance measures in healthy young and older adults.

**Methods:** Healthy participants (both younger and older, 25–94 years) performed a series of static and dynamic balance tasks while data was recorded from both the Gait&Balance App and a 3D motion system. Clinical balance measures were also recorded in older adults. The validity of the App measures was evaluated with the 95% confidence interval of Pearson's product moment correlation coefficient.

**Results:** The App provided valid measures of postural stability ($r > 0.68$), step length ($r > 0.61$), step time ($r > 0.96$), walking speed ($r > 0.7$) and periodicity ($r > 0.55$). Step length, walking speed and periodicity correlated with the Functional Gait Assessment ($r > 0.35$). Step length correlated with the Mini-BESTest ($r > 0.32$).

**Conclusion:** The Gait&Balance App can provide valid measures of balance in healthy young and older adults. Future research should investigate its validity and reliability in people with balance impairments.

**Implications:** This technology offers physiotherapists a potential tool to improve the objectivity and sensitivity of their balance assessments. In addition, this tool could be developed for telehealth and patient self-monitoring.

## WAKA HOURUA: A BICULTURAL KAITIAKITANGA MODEL FOR PHYSIOTHERAPY PRACTICE AND PROFESSIONAL SUPERVISION

**Otene, D.**

*Do Physio*

**Background:** In 2021 I enrolled in Te Wānanga o Aotearoa to do the Kaitiakitanga Programme, Postgraduate Diploma in Bicultural Professional supervision after being inspired by Graham Bidois Cameron speaking on 'Te Toi Ahorangi, Equity and Te Tiriti' some months before.

**Purpose:** The purpose of the rangahau/research in the programme was to develop my own model of kaitiakitanga/bicultural professional supervision and integrate it into my professional practice of physiotherapy.

**Methods:** Rangahau/Research into Māori and non-Māori bodies of knowledge which included Mātauranga Māori approaches contextualising themes drawn from tikanga, te reo, pūrākau, te toi, national and international professional supervision research and integrating with experience as a physiotherapist.

**Results:** My kaitiakitanga model for physiotherapy supervision and practice has been inspired by Te Tiriti o Waitangi, the beauty of te reo Māori, and my mother's bicultural journey in learning to weave a korowai.

It is based on a waka hourua, with harakeke tīkanga symbolising the kōrero which forms the interlocking fibres for the platform supporting the tiaki (supervisee/patient). The actions are symbolised by rotarota or hand signs, these are the mahi of the kaitiaki / supervisor alongside the tiaki on their journey. A karakia and rotarota sequence also feature as tools for self-care. In practise I also used the Poutama inspired model Ngā Mauri e Toru successfully in a small group.

**Conclusions:** My rangahau highlighted the need for manaakitanga/care in professional supervision especially in these unprecedented times. A bicultural model can inspire innovation and creativity in physiotherapy. More rangahau/research is required to test the model and practice of it in a bicultural physiotherapy supervision context. My goal is to do this next year in a Kaitiakitanga Master's Program, and it will require participation from physiotherapists willing to try a bicultural approach to supervision.

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## HIGH INTENSITY INTERVAL TRAINING IMPROVES AEROBIC FITNESS AND SURGICAL RISK STRATIFICATION IN ABDOMINAL CANCER SUFFERERS

**Panassollo, T[1]., Mawston, G[1]., Bigwood, B[2]., Sangamnerkar, G[2]., & Harison, I[2].**

*[1]Auckland University of Technology; [2]Wellington District Health Board*

**Background:** Cancer patients undergoing major abdominal surgery with low aerobic fitness are at increased risk of perioperative complications and mortality. These patients often have a 4–10 week window, prior to surgery, where prehabilitation exercise interventions can be used to improve aerobic capacity. Recently, it has been suggested that high intensity interval training (HIIT) has the potential to improve aerobic fitness over such a short period.

**Purpose:** To determine whether a prehabilitation programme involving HIIT and home-based walking can improve aerobic fitness and length of stay in hospital in patients undergoing major abdominal surgery.

**Methods:** 25 participants awaiting upper gastrointestinal (GI) surgery with low aerobic fitness participated in a 4–10 week prehabilitation exercise intervention that included 1–2 supervised HIIT sessions per week and home-based walking for the remainder of the week. Cardiopulmonary exercise testing (CPET) was performed prior to and after the exercise intervention. Comparisons in CPET measures and length of hospital stay were made with six patients awaiting upper GI surgery but not involved in a formal exercise programme.

**Results:** The exercise intervention group significantly improved aerobic fitness (anaerobic threshold (AT) and peak oxygen consumption (VO2 peak) ($p < 0.05$). This improvement resulted in patients moving from a high to a lower level of perioperative risk. Individuals undergoing prehabilitation also tended to have a shorter length of stay in hospital when compared to that standard care group.

**Conclusion(s):** A 4–10 week prehabilitation program involving supervised weekly HIIT training and home-based walking improved aerobic capacity and may have the potentially reduce perioperative risk and length of stay in hospital in patients undergoing upper GI surgery.

**Implications:** Physiotherapists should consider integrating HIIT into prehabilitation interventions for abdominal cancer suffers awaiting major surgery.

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## AUTONOMIC DYSFUNCTION ALTERS HEART RATE RESPONSES DURING NON-CONTACT BOXING IN PARKINSON'S DISEASE

**Panassollo, T., Mawston, G., Taylor, D., & Lord, S.**

*Auckland University of Technology*

**Background:** Non-contact boxing training (boxing) is a popular intervention used by physiotherapists to improve health in people with Parkinson's disease (PD). However, little is known about the effect of boxing on heart rate (HR) response which is relevant to training protocols and outcome. HR response is likely to vary in people with PD, particularly for those with chronotropic incompetence (CI), a feature of autonomic dysfunction.

**Purpose:** This study examined HR response during boxing in people with PD with (PD-CI) and without CI (PD non-CI), and in age-matched controls (control).

**Methods:** Participants underwent a cardiopulmonary exercise test (CPET) to determine CI, maximum HR (HRmax) and training zones. Two sessions of boxing were then performed on different days. During the sessions HR response was measure via Polar H10, and further expressed as %HRmax predicted (220-age) and as %HRmax obtained during CPET.

**Results:** At each boxing round HRmax and mean HR were significantly lower in the PD-CI group compared with PD non-CI and controls ($p \leq 0.001$). PD-CI exercised at 82% of estimated HRmax which was significantly lower than PD non-CI (97%) and control (100%). However, all participants exercised at approximately 100% of HRmax attained during CPET.

**Conclusion:** PD-CI present with lower HRmax and mean HR during boxing compared with PD-nonCI and controls. However, when expressed as %HRmax from CPET, these individuals exercise at similar exercise intensity (high-intensity training zone) during boxing, which is underestimated using traditional predictive equations.

**Implications:** People with PD (with and without CI) attain high intensity training zone during boxing. HRmax derived from CPET more accurately reflects exercise intensity than estimated HRmax, which is important to recognise given the latter is commonly used in clinical practice.

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## UTILISING CULTURAL HUMILITY IN THE DEVELOPMENT OF A CULTURALLY SAFE WORKFORCE

**Petley, W[2].**

*[1]Southern District Health Board, [2]University of Otago*

**Background:** Cultural competence in New Zealand's health workforce is a well-known concept that serves as the foundation towards growing a culturally safe health landscape. When navigating from cultural competency to cultural safety, the utilisation of Cultural Humility can provide healthcare staff a framework to develop their own knowledge on the intersections of culture and healthcare. In the Southern DHB, two clinical staff members (Witana Petley and Amy Mouru) created the "cultural humility hui" which provided a space to collectively share, critique, evaluate and learn about cultural nuances that occur within the healthcare system. The hui was developed with the intention to bring together diverse views, under the umbrella of cultural humility, to develop ongoing korero and collective growth to improved the cultural safety of the DHB staff. Through monthly hui of learning about culture and collectively engaging in activities to provoke korerō on sensitive subjects, attendees reported improved confidence with engaging with different cultures and reported a new appreciation of the diversity present within the hospital settings.

This novel venture helps to build onto the foundation of cultural competency, for the improvement of cultural safety within the Southern DHB. Cultural humility can be easily applicable to a variety of teams and fields due to its strength coming from the diversity of people who attend rather than the diversity of skills in the room. This can be utilised in any space and may be beneficial to health services who are looking to direct their growth from cultural competency to cultural safety.

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## “SOMEONE LIKE ANYONE ELSE”: A QUALITATIVE EXPLORATION OF NEW ZEALAND HEALTH PROFESSIONAL STUDENTS’ UNDERSTANDING OF DISABILITY

**Ravichandran, S[1,2]., Calder, A[2]., Ingham, T[3,4]., Jones, B[3,4]., & Perry, M[1].**

*[1]Canterbury District Health Board; [2]University of Otago; [3]University of Otago, Wellington; [4]Foundation for Equity and Research New Zealand*

**Background:** One in four New Zealanders identify as disabled. Disabled people, including Māori (the indigenous people of New Zealand (NZ)), experience health disparities. Systemic and individual health professional (HP) biases are factors that may affect health outcomes. Disability education is a means for improving attitudes and behaviours towards disabled people.

**Purpose:** To explore NZ HP students’ understanding of disability and health-related concepts.

**Methods:** HP students from one tertiary institution in NZ were interviewed through Zoom video call about their understanding of disability and health. A relativism paradigm and contextualism epistemology (underpinned by the socio-ecological model) shaped the reflexive thematic analysis. Transcripts were analysed at a deductive and latent level.

**Results:** Nine HP participants, from different professional courses and cultural backgrounds, were interviewed. Three main themes influenced participants’ understanding of disability: life experiences, professional education, and societal exposure. Participants who had more experience with disabled people had a deeper and more nuanced appreciation of the challenges disabled people face in accessing health services and obtaining equitable health outcomes. Cultural background also influenced the participants’ understanding of disability. Participants preferred more experiential learning methods to improve their knowledge of disability concepts. Lastly, expectations of inclusion are determined by observing social norms.

**Conclusion(s):** Participants reported learning just a few models of disability. The HP students predominantly came from a perspective of ensuring equality rather than equity. There was limited recognition of the systemic biases that exist within multiple social determinants and how these perpetuate health inequities for disabled people.

**Implications:** A socio-ecological consideration of disability throughout the curricula, self-reflection, acknowledging systemic bias, and proactively including disabled people as HP students and teachers are potential means for addressing health inequities

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## TAILORED VERSUS STANDARDISED REHABILITATION FOR PATIENTS WITH SHOULDER PAIN: A FEASIBILITY RANDOMISED CONTROLLED TRIAL

**Ribeiro, D., Tangrood, Z., Wilson, R., Sole, G., & Abbott, J.**

*University of Otago*

**Background:** Shoulder pain is the third most common musculoskeletal complaint. It is currently unclear which forms of exercise interventions are more effective for patients with shoulder pain.

**Purpose:** The aim of this study was to assess whether it was feasible to conduct a full trial comparing a tailored versus a standardised rehabilitation for patients with shoulder pain.

**Methods:** Two-arm, patient- and assessor-blinded, randomised controlled feasibility trial. Participants with subacromial disorders of the shoulder were randomly allocated into tailored or standardised rehabilitation. The primary outcome measures were (1) the participant recruitment rate; (2) the proportion of participants enrolled from the total number screened; (3) drop-out rates; and (4) adherence to the rehabilitation programme. We used linear mixed-effect models to obtain preliminary estimates of treatment effects using pain and function scores as clinical outcomes.

**Results:** Twenty-eight participants were randomly allocated to a tailored rehabilitation programme ($n = 13$) or a standardised rehabilitation programme ($n = 15$). The recruitment rate was 3 participants per month, the proportion of participants enrolled was 23%, the drop-out rate was 14%, and the overall adherence to the rehabilitation programme was 85%. No between-group differences were found for most secondary outcome measures. Adverse events ($n = 22$; 9 in standardised group, 13 in tailored group) were minor in nature and included delayed onset muscle soreness, skin injury or pain following taping.

**Conclusion(s):** Our feasibility trial showed that additional strategies are required for improving recruitment, enrolment and minimising drop-out of participants into the trial and making it feasible to conduct a full trial.

**Implications:** The information from the current study and the nested process evaluation will be used for improving the design of the full trial.

## CLINICIANS' PERSPECTIVES ON INTERVENTIONS OF A FEASIBILITY TRIAL: AN IMPLEMENTATION-BASED PROCESS EVALUATION STUDY

**Ribeiro, D[1]., Wilkinson, A[1]., Sole, G[1]., Lamb, S[2]., & Abbott, J[1].**

*[1]University of Otago; [2]University of Exeter, UK*

**Background:** Process evaluation studies examine how an intervention was implemented during the trial, by assessing the contextual factors within which the intervention was delivered. This study reports a process evaluation of the "MAnagement of Subacromial disorders of The shouldER (MASTER)" feasibility trial, which recruited patients with shoulder pain and allocated them into one of the following interventions: tailored or standardised rehabilitation programme.

**Purpose:** To investigate clinicians' perceptions on and assess the treatment fidelity of interventions tested in the Otago MASTER feasibility trial.

**Methods:** This is a mixed method, process evaluation study. Five experienced clinicians were involved with the delivery of interventions within the feasibility trial and took part in the focus group. To assess treatment fidelity, we audited and categorised the clinicians' records and compared those with the planned protocol. We calculated the overall treatment fidelity score and its standard deviation (SD) for both interventions combined, and for each intervention separately. A qualitative descriptive approach was used to explore clinicians' perspectives about the planned intervention.

**Results:** The fidelity scores were acceptable for both interventions combined (81.6%, SD: 6.9%), as well as when analysing each intervention arm separately (tailored programme: 80.3%, SD: 7.7%; standardised programme: 82.9%, SD: 5.9%). Clinicians' perspectives about the trial and planned intervention were summarized by one main theme "conflict experienced between individual clinical practice and the intervention protocol", which was supported by three sub-themes: (1) programme weaknesses and strengths; (2) design and administrative barriers; and (3) training barriers.

**Conclusion(s):** Overall, treatment fidelity of interventions was acceptable, with certain aspects of interventions presenting low treatment fidelity. Clinicians' perspectives about the trial can be summarized by one theme, i.e., "conflict experienced between individual clinical practice and the intervention protocol".

**Implications:** Findings from this study will inform the design of the definite trial.

## INTERNATIONAL CLASSIFICATION OF FUNCTION SUPPORTING A MINDSET CHANGE WHEN WORKING WITH LONG TERM DISABILITY

**Robinson, L.**

*Patricia Avenue School, Hamilton*

**Background:** Working with children with disability in an educational setting is a unique opportunity to develop long term relationships with the child, their whānau and their educators. The longevity can both cement relationships and cloud our view and therefore our intervention.

**Purpose:** To support a change in mindset within a multidisciplinary team with long term relationships by exploration of an evidence based holistic assessment such as the International Classification (ICF).

**Methods:** The ICF core sets for cerebral palsy and ASD were 'mapped' against a current long standing narrative multidisciplinary assessment to review what aspects of our assessments were missing and support a narrative assessment to be evidenced based.

The use of the environmental and personal barriers and facilitators became part of our combined multidisciplinary assessment process to which all team members contributed.

**Results:** Using the ICF core sets supported the current narrative combined therapy assessment to become evidence based. In addition, the use of the barriers and facilitators supported the team to look at their intervention from a different angle, rather than always focusing on intervention with the child some of the barriers and/or facilitators to achievement lie with the adults around the child or the environment.

**Conclusions:** The ICF core sets are an abbreviated version of the full ICF which can be 'mapped' to holistic multidisciplinary assessments turning a narrative assessment meeting the needs of a diverse staff to an evidence based holistic assessment. Utilising the ICF barriers and facilitators can change the mindset of how we approach assessments.

**Implications:** The novel use of the ICF for those with long term disability can support not only a holistic approach but an evidence-based approach to support a change in mindset to what you are assessing and how.

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## A CONCEPTUAL MODEL TO ENHANCE COLLABORATIVE GOAL SETTING FOR CHILDREN WITH DISABILITY IN EDUCATION

**Robinson, L[1]., Calder, A[2]., & Carrington, L[2].**

*[1]Patricia Avenue School, Hamilton; [2]University of Otago*

**Background:** Independent educational plans (IEPs) are the fundamental process for goal setting within an educational setting for children with disabilities. Authentic parent collaboration is the key to setting meaningful goals however, there is a paucity of research reviewing concepts or approaches to collaborative goal setting.

**Purpose:** This review study aimed to synthesise research focused on supporting collaborative goal setting for families of children with disability, specifically to identify: 1) frameworks used for parent collaboration in goal setting; and 2) family centred processes utilised in goal setting.

**Methods:** The databases of: Medline, CINAHL, Web of Science, Scopus and Cochrane, Education research complete, Education database (ProQuest), Eric (ProQuest), NZCER Journals online and Psych INFO were searched using key words and synonyms of collaboration, goal setting, children and disability. Extra ted date were grouped into similar concepts or frameworks and synthesised to create themes.

**Results:** Twenty-four studies were included for review and four key elements were identified as supporting collaborative family centred practice: 1) A child centred approach – enhancing the child's strengths and dreams, 2) Goal setting tools – identifying the child's current ability, 3) Processes to achieve collaborative family centred practice, and 4) External support during the IEP process.

**Conclusion:** Synthesis of the key findings led to a working model describing the child at the centre of the goal setting process, surrounded by collaborative constructs and practical strategies. Examples: Enhancing strengths and dreams through a person centred approach with portfolios or long term goal setting models.

**Implications:** Exploration and use of our model may support school therapists and leadership to enhance collaborative family centred practice for goal setting. Many of the constructs and strategies will also be of value for those therapists working across the disability sector.

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## PHYSIOTHERAPISTS' EXPERIENCES OF MANAGING RUGBY-RELATED CONCUSSION IN THE COMMUNITY

**Sole, G[1]., Badenhorst, M[2]., Whatman, C[2]., Walters, S[2]., Kerr, Z[3]., Register-Mihalik, J[3]., Sullivan, J[4]., & Salmon, D[4].**

*[1]University of Otago; [2]Auckland University of Technology; [3]University of North Carolina; [4]New Zealand Rugby*

**Background:** In 2018 New Zealand Rugby (NZR) implemented a concussion management pathway (CMP) to improve concussion management in community rugby. The CMP uses technology to support the management of a player through their concussion. Physiotherapists are often the only health provider involved with the community teams, and play a critical role in the management of concussions.

**Purpose:** This study explored physiotherapists' experiences of rugby-related concussion management as part of the CMP.

**Methods:** A pragmatic, qualitative descriptive approach to explore the perceptions of physiotherapists *(n* = 24) involved in the CMP. Thematic analysis was used to analyse data.

**Results:** Four themes were identified: i) 'Walking the tight rope between player welfare and performance': physiotherapists played a balancing act amongst the different attitudes and priorities of the various rugby stakeholders, namely the players, coaches, parents and general practitioners (GP). The CMP appeared to have a stabilising influence supporting the physiotherapists' role. ii) 'The influence of physiotherapists' authority' within the team and concussion management responsibilities; iii) 'Multi-directional communication' with all stakeholders; and iv) 'The influence of context', which included the complexity of concussion injuries, knowledge of the physiotherapist and team, work-load and resources to support the physiotherapist and access to a GP.

**Conclusion(s**): Physiotherapists had positive attitudes towards the CMP and appear to be well-positioned for their active role in the pathway. Priorities of other stakeholders; the authority of the physiotherapist and the flow of communication may either help or hinder physiotherapists' ability to optimally manage and support players with concussion.

**Implications**: (1) Early career physiotherapists should have mentoring to enhance their self-confidence and authority within the team environment; (2) Placing these findings in the context of the developing Physiotherapy Advanced Practitioner, there may be opportunity that such physiotherapists could support some of the GPs responsibilities in terms of concussion and/or clearance for return-to-learn and -play.

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## GIVING PATIENTS AGENCY OVER THEIR REHABILITATION: THE EFFECTIVENESS OF SELF-GUIDED WEB-BASED INTERVENTIONS TO IMPROVE PHYSICAL ACTIVITY FOR PEOPLE WITH CHRONIC HEALTH CONDITIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS

**Stavric V., Kayes, N., Rashid U., & Saywell, N.**

*Auckland University of Technology*

**Background:** The benefits of physical activity (PA) in people with chronic health conditions are well documented. This research looked at whether digital health interventions could give patients agency to guide the direction and progression of their rehabilitation.

**Objective:** The aim of this systematic review was to determine the effectiveness of self-guided web-based PA interventions to improve physical activity outcomes for people with chronic health conditions.

**Methods:** A comprehensive and systematic search for randomised controlled trials was conducted through university library databases, up to December 2021. Included trials evaluated the effect of self-guided web- or internet-based PA interventions on any PA related outcomes. Only studies whose interventions had minimal human contact and whose interaction was automatically generated were included. Standardised mean differences and 95% confidence intervals were calculated. PA data were pooled, and forest plots were generated.

**Results:** Of the 10,404 papers identified, 18 met the eligibility criteria and included 2466 participants. There was wide variety of health conditions and intervention parameters. Self-reported PA in the intervention group was greater than controls at the end of the intervention (standardized mean difference (SMD) 0.18 95% CI = 0.07, 0.28) and at follow up (SMD 0.31, 95% CI 0.16 to 0.46). The difference in objectively measured PA at the end of the intervention was moderate and non-significant (SMD 0.33 95% CI -0.22 to 0.87).

**Conclusions:** Self-guided web-based PA and exercise interventions provided a positive effect on PA immediately after the intervention. An unexpected and positive finding was a sustained increase in PA at follow-up. Physiotherapists are ideally placed to be examining different models of rehabilitation delivery and this review demonstrates that improvement in physical activity can be achieved with minimal contact. This concept might be confronting, but we believe it is important for our profession to lead the discussion.

**Protocol Registration:** PROSPERO CRD42019132464

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## VISUAL FIXATIONS AND VISUALLY INDUCED DIZZINESS: AN EXPLORATORY STUDY

**Taylor, D.**, **& Chaudhary, S.**

*Auckland University of Technology*

**Background**: Visually induced dizziness can develop as a sequela of a vestibular disorder and is characterized by symptoms of nausea, dizziness, and imbalance in rich visual environments such as supermarkets and shopping malls. To date, the mechanisms underlying visually induced dizziness are poorly understood. The aim of this exploratory study was to investigate the characteristics of visual fixations and postural sway in adults with visually induced dizziness compared to healthy adults when exposed to increasingly complex visual environments.

**Methods**: We recruited 20 adults with visually induced dizziness and 20 healthy adults to this cross-sectional exploratory study. Participants were instructed to maintain gaze on letters projected on a large screen with backgrounds of differing visual complexity. The number of visual refixations, movement of the centre of pressure, and movement of the head and body centres of mass were recorded.

**Results**: Adults with visually induced dizziness showed a significantly higher number of visual refixations ($F = 10.592$, $p < 0.01$), and increased mean velocity of head and body centres of mass movement ($F = 14.034$, $p < 0.01$ and $F = 6.553$, $p < 0.05$ respectively) compared to healthy adults.

**Significance**: Adults with visually induced dizziness exhibited visual fixational instability and increased postural and head sway compared to healthy adults. This was mainly observed in conditions with complex and moving backgrounds. This may account for reports from adults with visually induced dizziness of worsening symptoms in busy environments. The results from the study may assist in guiding intervention development to reduce symptoms of visually induced dizziness.

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## LESSONS MĀORI LED EARLY CHILDHOOD CENTRES CAN SHARE TO IMPROVE PAEDIATRIC HEALTH SERVICE – PERCEPTIONS OF CAREGIVERS OF MĀORI CHILDREN ATTENDING MĀORI CENTRED CHILDCARE

**Taylor, M[1].**, **Perry, M., Carrington, E., Bryant, K., Smith, D., & Sanerivi, O.**

*University of Otago*

**Background:** Lack of culturally responsive healthcare is one factor that contributes to the persistent health inequities that Māori experience in Aotearoa New Zealand. Health professionals are required to improve their cultural responsiveness by meeting cultural competence standards. There is limited evidence exploring what whānau with tamariki Māori value within their Māori-centred childcare services. Exploring the values and concepts considered meaningful at successful Māori designed and led childcare services, such as early childhood education centres, may provide insight into ways of developing and delivering child (or paediatric) physiotherapy services.

**Purpose:** The aim of this study was to identify the values and concepts considered culturally important to whānau with tamariki Māori at one Māori led, bilingual, early childhood education centre in New Zealand and consider their applicability to paediatric health services.

**Methods:** In-depth interviews were conducted with caregivers/whānau of tamariki Māori attending Te Pārekereke o Te Kī. Five semi-structured interviews were performed with eight parents of tamariki Māori currently attending the centre. A general inductive, latent and constructionist approach, informed by Māori models of health including Te Whare Tapa Whā, Te Wheke, and the Meihana model underpinned the interpretative and iterative analysis. In addition, the research team was guided by Kaupapa Māori Research (KMR) principles for data collection and analysis.

**Results:** Two major themes were identified, ‘Whānau Values and Aspirations’ and ‘Engagement’. The subthemes of ‘Whānau Values and Aspirations’ were ‘Whanaungatanga’, ‘Kaupapa Māori’, and ‘Freedom to Explore’. The subthemes of ‘Engagement’ were ‘Accessibility’ and ‘Wishes of Whānau respected’.

**Conclusion(s):** Strong connections and relationship were established where the environment was perceived to feel like an extension of home. Tuakana/teina relationships, that is teacher (tuakana) and learner (teina) were acknowledged as reciprocal relationships between parents and kaiako (teachers), parents and grandparents, as well as between the tamariki themselves demonstrating the fulfilment of Tino rangatiratanga.

**Implications:** This research provides insight into the values that paediatric healthcare workers can incorporate into their services to better engage with whānau who have tamariki Māori. Communication and co-design with successfully established Māori led early childhood groups can improve the cultural responsiveness of our paediatric healthcare services.

## BARRIERS AND FACILITATORS ENCOUNTERED BY PHYSIOTHERAPISTS WHEN MANAGING PATIENTS WITH ROTATOR CUFF TEARS

**Whelan-Henderson, O[1]., Ribeiro, D[1]., Fahey, T[1]., Verhagen, A[2]., & Perry, M[1].**

*[1]University of Otago; [2]University of Technology Sydney, Australia*

**Background:** Previous literature suggests physiotherapists may encounter challenges when assessing and managing patients with rotator cuff tears. New Zealand has a unique health system and those challenges have not been explored qualitatively within the New Zealand context.

**Purpose:** To explore the challenges and facilitators faced by physiotherapists in New Zealand when assessing and managing patients with rotator cuff tears.

**Methods:** This is a qualitative study, using semi-structure interviews. We recruited participants who have treated at least 3 patients with rotator cuff tears in the last year and held a current annual practice certificate with the Physiotherapy Board of New Zealand. One researcher transcribed interviews and read transcripts to increase familiarity with the data. One researcher coded the data by identifying relevant sections and quotes to form groups of similar codes. These codes were then analysed to identify emergent themes that could answer the research question. Three researchers discussed and refined themes until agreement was reached. Individual interviews were audio-recorded, transcribed in verbatim and analysed using an interpretive description framework.

**Results:** Four themes were identified: (1) reliance on biomedical approach: clinicians relied on a biomedical approach to base their clinical reasoning when assessing and planning the treatment; (2) challenges to incorporate psychosocial factors; (3) the role of experience; (4) macro and meso level barriers.

**Conclusion(s):** Identified barriers Clinicians faced challenges ranging from individual- to macro-level barriers. Our findings provide invaluable insight into the challenges and facilitators physiotherapists encounter in New Zealand when managing patients with rotator cuff tears.

**Implications:** These findings can be used by future researchers, healthcare services and policy makers to reduce barriers and improve care for those patients.

## COMMUNITY ORTHOPAEDIC TRIAGE: EARLIER ASSESSMENT AND INTERVENTION THROUGH PHYSIOTHERAPY-LED ORTHOPAEDIC CLINICS

**Willis, C.**

*Bay of Plenty District Health Board*

**Background:** Musculoskeletal (MSK) conditions are the leading cause of disability in New Zealand. Demand on Orthopaedic services increasingly outweighs capacity. Advanced practice physiotherapy roles are well established internationally demonstrating safety, cost effectiveness, diagnostic agreement and positively impacting wait times for speciality care. To our knowledge, this is the first example of an innovative service model providing publicly funded physiotherapy-led community-based orthopaedic clinics.

**Purpose:** To provide a physiotherapy-led community-based orthopaedic triage service with earlier access to assessment and alternatives to surgery for people with musculoskeletal orthopaedic conditions.

**Methods:** The BOPDHB Orthopaedics and Allied Health services partnered to develop and implement a community orthopaedic triage service (COTS). Referrals from primary care are triaged within 72 hours and a comprehensive assessment performed by a highly skilled physiotherapist within 6–weeks. The Physiotherapist identifies an appropriate wellbeing management pathway, including surgical and non-surgical management options. There are 6 clinics located throughout BOP communities with a particular focus on rural and high Māori population areas.

**Results:** In 2021, 1669 patients were seen in COTS clinics. The average wait time for an appointment was 42 days. DNA rates were less than 2%. Outcome statistics reveal 30% of people were referred to Orthopaedic First Specialist Assessment (FSA) for a range of reasons including but not limited to high tech imaging, interventional injection and/or surgical opinion. 50% of those referred were for high-tech diagnostic imaging which has led to the development of a Spinal MRI pathway which is currently being piloted. 45% are referred for physiotherapy intervention, 13% to a community-based education and activity programme and 10% discharged with appropriate education and advice.

**Conclusions**: Service evaluation shows preliminary evidence that up to 70% of GP referred patients can be triaged, assessed and managed independent of Orthopaedic FSA

**Implications:** The COTS model demonstrates the role for physiotherapists, with appropriate training and competence, in enabling people with MSK conditions to have access to timely orthopaedic triage, assessment and alternatives to surgery closer to their homes and communities. The next step is to explore access to timely non-surgical interventions and empower people to live well with musculoskeletal disease.

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## IMPLEMENTATION OF TIKANGA MĀORI INTO CLINICAL PHYSIOTHERAPY TREATMENT – EXPERIENCES AND RECOMMENDATIONS

**Wilson-Munday, T., Petley, W., & Bryant, K.**

*University of Otago*

**Background:** Tikanga is a Māori "way of doing things" in Te Ao Māori in the broadest sense: the customary system of practices and values that are manifested in every social environment. Using tikanga Māori practices within healthcare delivery is an identified method which is engaging for many Māori patients. HRC funded 4th year UoO physiotherapy student, Tali Wilson-Munday (supervised by Katrina Bryant and Witana Petley), conducted a summer studentship to investigate perspectives of tikanga practices in physiotherapy.

**Purpose:** The goal of this study was to provide insight on challenges and accomplishments for physiotherapists on incorporating tikanga Māori techniques, and recommendations for future advances in tikanga Māori application in physiotherapy clinical practice.

**Methods:** This study was conducted using qualitative methodology underpinned by Kaupapa Māori theory (KMT). Data was collected via semi structured interviews with six Māori physiotherapists.

**Results:** Results from interviews revealed many interlinking themes within experiences and recommendations including: acknowledged diversity of lived experiences of tikanga for Māori; need for allowing more resources to create spaces to whakamana Māori communities; normalising te reo and tikanga Māori by supporting increased tikanga in undergraduate training and workplace practices; challenging barriers to institutions and workplaces that limit implementation of tikanga in physiotherapy clinical practice.

**Conclusion(s):** Participants provided clear insights on their experiences with tikanga Māori as well as recommendations on how to effectively implement Tikanga Māori into clinical practice. There is room for improvement in resources and organisational policy within physiotherapy training and clinical practice supporting tikanga Māori and need for further research on this topic.

**Implications:** Guided by results of this research, normalisation of application of tikanga Māori within physiotherapy in Aotearoa will lead to positively impact how physiotherapists provide accessible treatment for Māori patients and whānau, helping move towards equitable health outcomes.

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# Focused Symposium Abstracts

## PAIN SENSITIVITY ASSESSMENT AND CLINICAL MANAGEMENT IN MUSCULOSKELETAL DISORDERS

**Moloney, N[1]., Beales, D[2]., & Rabey, M[2].**

*[1]University of Auckland; [2]Curtin University, Perth, Australia*

### Learning objectives

1. Understand the evidence for pain sensitivity to (1) modify patient presentations; (2) affect common treatments utilised by musculoskeletal clinicians; and (3) influence the prognosis/course of a disorder.
2. Utilise screening tools and subjective features to identify when physical assessment of pain sensitivity should be prioritised in the physical examination and develop knowledge of assessment strategies for pain sensitivity.
3. Develop knowledge and skills to integrate assessment findings into clinical reasoning to formulate management plans for patients with heightened pain sensitivity.

### Description

Research on musculoskeletal disorders indicates that pain sensitivity can be an important consideration for musculoskeletal clinicians in the holistic view of a patient presentation. Sub-groups of people with musculoskeletal disorders have been shown to display signs of heightened pain sensitivity and people with low back pain and heightened pain sensitivity demonstrate greater levels of pain and disability and poorer mood. Further, the presence of heightened pain sensitivity has been shown to influence outcomes for example, responses to lumbar surgery, knee surgery, and guideline-based physiotherapy management for knee osteoarthritis and chronic whiplash.

Quantitative sensory testing has been used widely in research studies; however, there is growing interest in using these assessments in clinical practice, called clinical sensory testing. The diversity and inconsistencies in research findings in this field can make this a difficult concept for clinicians to navigate, particularly when individuals show variable patterns. This workshop will present clinical sensory testing for pain sensitivity and how the relationship of pain sensitivity with pain and disability is not linear. Rather the real importance of pain sensitivity in a clinical presentation may be: (1) the potential for pain sensitivity to modify the effect of common treatments utilised by musculoskeletal clinicians, and/or (2) the effect of pain sensitivity on the prognosis/course of a disorder. Further, pain sensitivity assessment may form an important part of identifying the recently defined third mechanistic category of pain called nociplastic pain.

This symposium will comprise three main parts:

1. The evidence for the presence of pain sensitivity in musculoskeletal disorders and how pain sensitivity can impact treatment responsiveness. Evidence relating to the spectrum of subgroup and individual presentations will be highlighted and discussed with respect to its clinical relevance.
2. A pragmatic approach to clinical assessment will be provided. The use of screening tools and in the physical examination will be described. A pragmatic blueprint for specific assessment related to pain sensitivity will be outlined including static and dynamic measures (e.g., exercise-induced hypoalgesia). Issues relating to the reliability and diagnostic validity of using pain sensitivity tests in clinical settings will be discussed.
3. Using clinical examples, a framework for integrating assessment findings into clinical reasoning to guide assessment and formulate management plans for the pain sensitive patient will be provided. Examples relevant to primary care and more specialised pain services will be discussed.

## SUPPORTED SELF- MANAGEMENT: WHY IT'S HOT AND WHAT IT'S NOT

**Hale, L., Perry, M., & Gray, E.**

*University of Otago*

### Learning objectives

1. On completion of this focused symposium, attendees will:
2. Know the principles underpinning supported self-management.
3. Understand the distinct role of physiotherapy in supported self-management compared to self-management.
4. Experience the application of these principles from a simulated activity.
5. Reflect on how the principles of supported self-management can be applied in their practice.

### Description

Self-management is arguably the healthcare buzzword of the early twenty first century. Self-management is described as "a dynamic process in which the individual manages the symptoms, treatment, physical, and psychosocial consequences and lifestyle changes inherent to living with a chronic condition," yet most of these decisions are made away from the healthcare professional.

Recognising people's own expertise in self-managing their own lives, and thereby extension their own health condition, health professional involvement in *supported* self-management is increasing. Supported self-management is more than "self-management"; it is a partnership between healthcare professionals, patients and their whānau/family, with healthcare professionals working collaboratively to support and empower patients and their whānau/families to manage their health. In supported self-management, healthcare teams and systems collaborate with an individual and their whānau to support their self-management endeavours and enhance well-being through informed decision making and action taking, to care for and sustain their or their loved one's health. Literature suggests not all healthcare professionals take on this partnership role, with healthcare professionals acting rather as educators, dictators and monitors. Health professionals act in these expert roles because they feel responsible for patient outcomes and have a hard time relinquishing control to patients.

Barriers to participation in the process of supported self-management include multi-step referrals and uptake processes, environment and financial barriers, and a mismatch between individual health beliefs and programme content, focusing on symptom management and patient activation, and not on what matters to the person. The term "self" implies individual responsibility and personal agency, a perception criticised for diminishing need for social responsibility and collective action to support people with varying needs. Further, self-management is considered a Western construct necessitating adaptation for indigenous and ethnic minority groups. Evidence now supports a capabilities perspective approach to supported self-management to develop a collaborative, supportive and enabling relationship between the person with the health condition/s and their healthcare professionals. Additionally, whilst health literacy plays an important role in self-management, the focus on an individual's health literacy attributes (i.e., that individuals have poor health literacy) is now questioned, contending that the onus should be on organisations to be responsive to the health literacy of people accessing their services.

In this focussed symposium we will elaborate on what *supported* self-management is, its underlying principles and values, and how it differs to self-management. We will then, from our research, illustrate these concepts with clinical examples from a variety of practice contexts and with interactive activities to provide guidance for how they might be applied in a range of physiotherapy practice. We will encourage attendees to reflect on how they can embed supported self-management principles into their own clinical practice no matter their work setting.

# Fishbowl Abstract

## CHILDREN ARE NOT SMALL ADULTS – BUT DOES EVERYONE KNOW THAT?

**Eastwood, E[1]., Meys, A[2]., Thurlow, A[1]., Quinn, D[3]., Carnachan, K[4]., & Ness, A[1].**

*[1]Tauranga Hospital; [2]Avenues Physio-Fitness, Tauranga; [3]Back in Motion, Dunedin; [4]Auckland Physiotherapy*

Childhood is a unique period of extensive development and learning, requiring practitioners' acknowledgement and understanding of the cognitive, physical, psychological and social changes in the children and whānau they work with. Musculoskeletal disorders in paediatric patients account are the sixth most common reason for presentation at primary care. With the Accident Compensation Corporation model in Aotearoa, children can and do present in the first instant to a physiotherapy private practitioner, which predominantly has an adult-focussed environment and approach. Currently there is limited specific paediatric content in the undergraduate physiotherapy degrees offered in Aotearoa.

Within primary care, a lack of specific training and understanding of child-specific conditions have been noted as reasons for poor management of childhood chronic pain and other conditions. Additionally, a lack of clinical guidelines is highlighted as a reason for delays in diagnosis and numbers of tertiary referrals for children. With paediatric patients it is pertinent to recognise not only red flags but yellow flags and also be aware of not pathologising normal variants throughout the ages. Internationally there are musculoskeletal paediatric physiotherapy competence frameworks which provide physiotherapists with a guide to the range of knowledge, and skills and abilities they need to work at a safe, effective, professional standard. The question is should we be using them here in Aotearoa?