Rehabilitation
RESEARCH REVIEW™

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Issue 72 – 2025

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Welcome to issue 72 of Rehabilitation Research Review.

We begin this issue with a mixed methods realist evaluation assessing the telehealth delivery of complex wheelchair assessment in Aotearoa New Zealand, the findings of which highlight promise, but also persistent barriers. In a study from the UK, a self-guided return-to-work toolkit for stroke survivors and employers was presented. Such a resource has strong potential in Aotearoa New Zealand, where access to vocational rehabilitation following stroke is not routinely available. We conclude this issue with a study reinforcing the value of high-intensity programmes in promoting neuroplasticity and improving outcomes for patients who have experienced a stroke.

I hope that you find the information in this issue useful in your practice and I welcome your comments and feedback.

Kind regards,

Professor Nicola Kayes
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A mixed methods realist analysis of telehealth delivery of complex wheelchair assessment in Aotearoa New Zealand: Contexts, mechanisms, and outcomes

Authors: Graham F et al.

Summary: This mixed methods realist evaluation study assessed the telehealth delivery of complex wheelchair assessment among four remote specialist assessors (physiotherapists and occupational therapists), six on-site assistants (local occupational therapist, physiotherapist, or family member), and five wheelchair users in Aotearoa New Zealand. Tele-delivered assessment of wheelchair and seating was declined by on-site assistants in 78% of cases where the specialist assessors considered it could work. When delivered to wheelchair users, most goals were achieved with high satisfaction. Context-Mechanism-Outcome configurations emphasise the importance of system design in telehealth uptake by health professionals.

Comment: This is a timely analysis of telehealth delivery for complex wheelchair assessment in Aotearoa New Zealand. The findings highlight promise, but also persistent barriers. While telehealth assessments led by specialist assessors have the potential to improve access and mobility outcomes, uptake was limited. Interestingly, the primary barrier to implementing telehealth assessments appeared to be therapists' hesitancy. When telehealth was used, wheelchair users reported high satisfaction and meaningful progress towards their mobility goals, along with reduced travel time. While clients acknowledged the challenges of telehealth, they reflected that the process did not need to be perfect to meet their needs. In contrast, therapists felt constrained by systemic factors, lacked confidence, and expressed concerns about professional exposure if things went wrong. The study also surfaced important questions about cultural responsiveness. While Māori participants expressed satisfaction, proactive engagement with cultural needs during telehealth sessions was limited. The authors recommend co-designing culturally responsive training and resources, and emphasise the need for system-level change to support hybrid models of care. Overall, this work offers valuable insights for service development, highlighting the need for workforce training, supportive infrastructure, and culturally attuned practice to realise the full potential of telehealth in wheelchair assessment.

Reference: Disabil Rehabil Assist Technol. 2025;May 4 [Epub ahead of print]
Abstract

Impact of intensive, multidisciplinary neurorehabilitation on functional independence following pediatric acquired brain injury (ABI): A matched cohort study

Authors: Furman R et al.

Summary: This matched (age, injury characteristics, functional status) cohort study examined the impact on functional independence following paediatric acquired brain injury of lower-intensity ($n = 19$) and higher-intensity multidisciplinary neurorehabilitation ($n = 19$). There were no differences between groups in Functional Independence Measure for Children (WeeFIM) efficiency, WeeFIM Developmental Functional Quotients (DFQs), or length of stay (LOS), but across all participants there was a difference between admission and discharge WeeFIM DFQs ($p < 0.001$). Regression analysis suggested a relationship between occupational therapy intensity and discharge WeeFIM DFQs ($p = 0.003$; $\Delta r^2 = 0.22$). LOS was predicted by admission WeeFIM DFQs in both lower ($p = 0.016$; $r^2 = 0.29$) and higher ($p < 0.001$; $r^2 = 0.51$) intensity cohorts.

Comment: I admit to being somewhat confused by this study. The introduction raised several important points: the lack of definitive parameters for intensity in paediatric rehabilitation following acquired brain injury, and the unique interactions between age and neuroplasticity that make paediatric populations a critical focus. These are important issues and I was drawn to the paper because I believe they warrant deeper exploration. However, aspects of the study design left me underwhelmed in terms of its contribution to advancing knowledge. First, intensity was defined as 'total minutes in direct therapy', despite the authors acknowledging that time alone is not the most robust measure and citing research which highlights effort and task complexity as equally important dimensions. Second, it was unclear how participants were categorised into "lower-intensity" versus "higher-intensity" groups. This categorisation appears to be an artefact of the cohort design, where therapy minutes were recorded but not curated, and no clear threshold was provided to distinguish between groups. Third, while matching participants on age and injury characteristics helps control for confounding variables, it may also limit our ability to tailor and optimise intervention parameters for specific subgroups. Future research would benefit from clearer operational definitions of intensity and more targeted designs that allow for subgroup-specific insights, especially if we are to develop meaningful, person-centred rehabilitation intensity protocols for children and young people with acquired brain injury.

Reference: J Pediatr Rehabil Med. 2025:Jul 13 [Epub ahead of print]
Abstract

Development of a digital, self-guided return-to-work toolkit for stroke survivors and employers using intervention mapping

Authors: Craven K et al.

Summary: This UK study assessed the development of a self-guided return-to-work toolkit for stroke survivors and employers based on steps 1-4 of the six-step Intervention Mapping approach. The toolkit consists of two Xerte eLearning packages and contains theory- and evidence-based content for stroke survivors and employers. Stroke survivor content focused on identifying and communicating support needs to employers. Employer content focused on understanding stroke survivors' work capabilities and tailored adjustments. Pretesting suggested the toolkit is comprehensive and empowering, fostering open communication, information and practical tools.

Comment: This paper offers a rich account of the co-design process behind a self-guided return-to-work toolkit. Such a resource has strong potential in Aotearoa New Zealand, where access to vocational rehabilitation following stroke is not routinely available. The needs assessment phase of the co-design process surfaces some of the complexity of return-to-work for stroke survivors. Employers often lacked a clear understanding of stroke and frequently misjudged survivors' capabilities. At the same time, stroke survivors were hesitant to disclose their needs, shaped by assumptions about employer responses and fears of discrimination or dismissal. This mutual disconnect created barriers to successful return-to-work, including limited access to timely support and reasonable adjustments. These experiences are likely to resonate with both employers and stroke survivors in the New Zealand context. The co-designed toolkit includes resources for both groups, drawing on lived experience and grounded in evidence and theory. Several supplementary files are freely available, offering detailed insight into the intervention logic and design rationale. If you work in this space, I highly recommend engaging with this work and reflecting on how it aligns with or informs your own practice.

Reference: PLOS Digit Health 2025;4(8):e0000971
Abstract

The experiences and perspectives of participating in a nature integrative rehabilitation programme when suffering from post-concussion syndrome: Responses, gains, and impact from using enriched nature environments as a rehabilitation setting and integrating nature as rehabilitation means

Authors: Sidenius U et al.

Summary: This Danish qualitative study examined the perspectives of individuals participating in a 10-week nature integrative rehabilitation programme focused on benefits, challenges, and impact in rehabilitation for post-concussion syndrome (PCS). Semi-structured interviews with 23 participants reported enhanced emotional and sensory engagement leading to decreased PCS symptoms. The programme promoted present-moment awareness, relaxation and physical activity. Facilitators' ability to adapt to individual needs was crucial. The use of group settings reduced feelings of isolation and provided social support.

Comment: The authors use the framing Nature Integrative Health (NIH) to emphasise the active and intentional use of the natural environment in rehabilitation, where the environment itself is considered an active and health-supportive intervention component rather than simply being the setting in which an active intervention is delivered. This approach aligns with a biopsychosocial model of care, and I would suggest it is also likely to resonate deeply with Te ao Māori, where connection to the natural world is foundational to wellbeing. Writing led by one of my colleagues, Associate Professor Isaac Warbrick, offers just one example of this (Warbrick I et al., Int J Environ Res Public Health 2023). In this study, the intervention was situated within a therapy garden designed to support varied experiences (active engagement, quiet reflection, sensory stimulation) through distinct spaces such as open areas, secluded spots, and water features. The findings are promising and have sparked my interest in exploring how natural environments can be more actively integrated into rehabilitation. I also suspect that paying closer attention to the environments in which rehabilitation is delivered, whether natural or built, could offer broader benefits, even beyond a specific focus on nature.

Reference: Int J Qual Stud Health Well-being 2025;20(1):2503604
Abstract

Understanding the importance of causation

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Understanding causation will help you provide the right information, so we can make quick cover decisions.

Before deciding on cover, we need to be confident it's more likely than not the person's injury was caused by their accident.

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Effectiveness of digital health interventions on sedentary behavior among patients with chronic diseases: Systematic review and meta-analysis

Authors: Zhang Y et al.

Summary: This systematic review and meta-analysis examined the use of digital health interventions in reducing sedentary behaviour among patients with chronic diseases (obesity, arthritis, coronary artery disease, cancer, type 2 diabetes mellitus, metabolic syndrome, stroke) based on 26 trials including 3800 participants. Interventions included self-monitoring of sedentary behaviour, reminding interruption of long undisturbed sitting, and promoting goal attainment. Approaches to sedentary behaviour reduction varied from standing, walking, limited screen time, and contextual-related activities based on patients' preference to light or moderate-to-vigorous physical activity. Most (80.8%) studies had a low to moderate risk of bias. Meta-analysis demonstrated decreases versus nondigital interventions in overall sitting time (mean difference [MD] -30.80; 95% CI -49.79 to -11.82; p = 0.001), pre-post sitting time changes (MD -50.28; 95% CI -92.99 to -7.57; p = 0.02), and sedentary behaviour proportions (MD -4.65%; 95% CI -7.02 to -2.28; p < 0.001); effect sizes were generally small (Cohen's D = -0.27 to -0.47).

Comment: This review included interventions using various digital technologies, such as mobile phones, web platforms, apps, wearable trackers, and email, to address sedentary behaviour. Importantly, studies that used wearables solely for measurement (rather than intervention) were excluded. The most used technology was mobile phones (84.6%), followed by activity trackers (50%) and web-based platforms (26.92%), though many interventions combined multiple tools. What stood out to me was the variability in how sedentary behaviour was measured. Indicators included total sitting time, changes in sitting time pre- and post-intervention, the proportion of sedentary time relative to total activity (excluding sleep), sedentary bouts (uninterrupted periods of inactivity), and breaks in sedentary time (frequency of interruptions). I'm not an expert in this field, but I suspect each of these indicators may relate differently to health outcomes. Understanding these relationships would help assess the robustness of the measures used. Alternatively, if each indicator holds independent value, it would be useful to explore how interventions can be tailored to target specific aspects of sedentary behaviour. One limitation of the review was its inability to unpack how interventions may vary in effectiveness across different populations. Overall, this review provides a solid update on the broad state of evidence. I'd welcome future research that includes more nuanced exploration of the interactions between population, intervention design, and outcomes.

Reference: JMIR Mhealth Uhealth 2025:13:e59943
Abstract

"The most important thing is having patience, both of us." Successful conversations from the perspective of people with aphasia and their primary conversation partners

Authors: Rotherham A et al.

Summary: This study used online focus groups and the nominal group technique to define "conversation success" from the perspective of 20 people with aphasia (PWA) and their primary conversation partner (PCP; n = 19) with the objective of creating a patient-reported outcome measure of dyadic conversation. Across eight focus groups, 190 items were identified as describing successful conversation and five common themes were identified: working it out together; patience; familiarity with conversation partner; consideration of the conversation environment; and a positive attitude and mindset.

Comment: The authors of this paper illuminate the complexity of outcome measurement in communication partner training (CPT), and particularly the challenge of defining 'conversation success'. Their exploration of this concept from the perspectives of PWA and their PCP is both timely and important. Prompted by their work, I revisited existing CPT outcome measures and found myself in agreement – current tools tend to prioritise transactional elements such as aphasia knowledge and strategy use, with limited attention to psychosocial dimensions. What struck me most in the findings of this paper was the nuanced interplay of factors (relationship, emotion, cognition, fatigue, and environment) all shaping the success of a conversation. In that sense, communication success appears to be a dynamic, person- and context-specific negotiation between the PWA and their PCP, with each actively managing self, other, the relationship and communication environment to foster a positive communication experience. The authors have made a valuable contribution by identifying measurable components of conversation success. I wondered if it's time to move beyond conventional metrics. How might we embrace a more holistic, flexible approach that honours the lived experience of communication and better reflects its relational essence?

Reference: Disabil Rehabil. 2025;Aug 24 [Epub ahead of print]
Abstract

Living well with complex regional pain syndrome: A qualitative exploration of lived experiences

Authors: McVicar T et al.

Summary: This reflexive thematic analysis sought to understand how 10 participants with complex regional pain syndrome (CRPS) have learned to "live well" despite long-term (≥12 months) CRPS. Participants described a journey from not living well to living well. Three themes were identified that supported the journey: "Making sense of my new life with CRPS" through diagnosis and information seeking to a personalised understanding of CRPS; "Taking control in a seemingly uncontrollable world" with professional and social support trialling self-management tools to regain control; "Rebuilding a purposeful life with a new identity" by acceptance and rebuilding purpose participants created a post-CRPS identity.

Comment: I really enjoyed this paper. The authors raise an important point that there is often an implicit assumption that better outcomes equate to living well. Consistent with the principles of positive psychology, which emphasise that well-being is more than just the absence of disease, the authors challenge the notion that living well can be equated with fewer symptoms or reduced distress. Their critique of CRPS research as deficit-focused and disease-centric is compelling, and their call for more strengths-based approaches is both timely and necessary. Whether intentional or not, I found it striking that this same shift was reflected in the participant narratives of living well. Participants articulated the process of living well as a transition from "living against CRPS" to "living well with CRPS"; from enduring "in spite of" to embracing "living with"; and from symptom resolution and life postponement to "making room for the ways CRPS changed their capabilities" and "rebuilding purpose and meaning". This transformation was supported by three key processes: making sense, taking control, and rebuilding life. While participants drew on various sources of information to make sense of their experience, they ultimately developed unique, personally meaningful models of CRPS shaped by their personal experience in the context of their lives. Supporting individuals to construct these personalised understandings, and working with them in ways that honour their specific experiences, may be important in fostering a meaningful shift towards living well.

Reference: Disabil Rehabil. 2025;Jun 30 [Epub ahead of print]
Abstract

INDEPENDENT COMMENTARY BY

Professor Nicola Kayes

Professor Nicola Kayes is Associate Dean of Research in the Faculty of Health and Environmental Sciences and Co-Director of the Centre for Person Centred Research at Auckland University of Technology. Nicola has a background in health psychology and as such her research predominantly explores the intersection between health psychology and rehabilitation. Nicola actively contributes to postgraduate teaching in rehabilitation in the School of Clinical Sciences at Auckland University of Technology. **For full bio CLICK HERE.**

Identifying the bridges between post concussion symptoms and psychological distress in mild traumatic brain injury using network analysis

Authors: Faulkner JW et al.

Summary: This New Zealand, cross-sectional, network analysis examined item-level relationships between post-concussion symptoms (PCS), assessed using the Rivermead Post Concussion Questionnaire, and psychological distress, assessed using the Depression, Anxiety, Stress Scale 21 (DASS-21), in 436 participants with mild traumatic brain injury. Two bridging connections were identified: sleep disturbance and the hyperarousal component of psychological distress; and concentration difficulties and lack of initiation component of psychological distress.

Comment: This was an excellent paper. The analytical technique, network analysis, makes it somewhat technical, but I appreciated the care taken to describe and explain both the method and its interpretation. As someone unfamiliar with network analysis, I found myself learning as I read. Nonetheless, I will try to break this down for you (and hope the authors will forgive me if I don't quite get some of it right). The authors highlight a broad understanding of the bidirectional relationship between PCS and psychological distress. However, they argue that there is limited insight into how specific symptoms interact and influence one another. Network analysis offers a way to explore this complexity by identifying symptoms with high centrality, those strongly and frequently connected to others, and bridging symptoms that link different symptom clusters. This approach has practical implications for intervention. The authors identified two key bridging connections: sleep disturbance and hyperarousal ("I found it difficult to wind down" and "I found it difficult to relax"), suggesting sleep as a potential target in managing stress and anxiety; and concentration difficulties and lack of initiative ("I found it difficult to work up the initiative to do things"), which appear central to the relationship between cognition and depression. The authors propose several avenues for future research. I believe this more nuanced understanding of the PCS–psychological distress relationship holds significant promise for informing therapeutic approaches.

Reference: J Head Trauma Rehabil. 2025;Aug 20 [Epub ahead of print]
Abstract

Acceptability and feasibility of a cognitive behavioural intervention for pain management before total knee arthroplasty: A pilot trial

Authors: Bean DJ et al.

Summary: This pilot trial assessed a cognitive-behavioural intervention targeting post-surgical pain risk factors in patients scheduled for total knee arthroplasty. In total, 241 people were pre-screened, 144 were invited to complete screening, 51 declined, 58 failed inclusion criteria, 35 enrolled, and 30 completed the pilot trial. Participant satisfaction ratings were high, and the content was understandable, useful and relevant. The cognitive-behavioural intervention induced small improvements in pain intensity and pain catastrophising scores with modest effect sizes (0.32-0.33).

Comment: This pilot trial explored the feasibility and acceptability of a brief cognitive behavioural intervention delivered during the perioperative phase. While there is strong evidence supporting the predictive value of psychological factors in persistent post-surgical pain, there is far less research on pre-surgical psychological interventions that might help mitigate this risk, making this study both timely and relevant. Overall, the findings were encouraging: the intervention was well received, and there was a promising trend towards improved outcomes that warrants further investigation. What particularly caught my attention; however, was that 51 individuals (35%) declined to complete screening. Understanding their reasons could be critical to ensuring interventions like this reach their full potential in practice. Another important nuance was the impact of COVID-related surgical waitlist delays, which reduced the proximity of the intervention to the surgery itself. This may have implications for its effectiveness and should be considered in future research. Despite these feasibility challenges, this work shows real promise. I look forward to seeing how the research evolves and contributes to more proactive, psychologically informed approaches in the perioperative phase for people awaiting total knee arthroplasty.

Reference: Psychol Health. 2025;Sep 1 [Epub ahead of print]
Abstract

Exercise intensity matters in the rehabilitation of stroke in the acute stage: A randomized controlled trial

Authors: Amanzonwé ER et al.

Summary: This study assessed high-intensity interval training (HIIT) cycling versus combining unloaded cycling (sham) plus conventional physiotherapy for promoting functional recovery in 44 acute stroke survivors. Analysis of variance identified a time × group interaction indicating that changes after 6 weeks of training in maximal exercise test peak workload (WRpeak; mean +17.7 W; 95% CI 10.2-25.1; $p < 0.001$), 6-minute walk test (6MWT; mean +126.8 m; 95% CI 77.9-175.7; $p < 0.001$), 10-metre walk test (10WT; mean +0.5 m/s; 95% CI 0.3-0.7; $p < 0.001$), and modified Rankin Scale score (mRS; mean -0.7 point; 95% CI -1.2 to -0.2; $p = 0.012$) were greater for HIIT cycling than sham. The changes were also greater in the HIIT group up to 6 months ($p < 0.001$) after training.

Comment: The role of intensity in stroke rehabilitation has long been a focus of research. This study, like others before it, reinforces the value of high-intensity programmes in promoting neuroplasticity and improving outcomes. However, I'm unclear on the extent to which this evidence has been translated into routine practice, particularly in acute and subacute rehabilitation settings. There is substantial research exploring time spent in active therapy, highlighting the gap between recommended guidelines and practice. Yet, time spent in therapy is only one aspect of dosage. This study underscores intensity as another critical parameter, suggesting that protocols should not only prescribe high intensity but also progressively increase the level of challenge. My colleague, Associate Professor Nada Signal, led research some years ago (Signal N et al., NeuroRehabilitation 2016) showing that people with stroke found high-intensity rehabilitation both acceptable and engaging. If high-intensity training is both beneficial and acceptable after stroke, how might we support the integration of high-intensity rehabilitation into everyday practice?

Reference: Neurorehabil Neural Repair 2025;Aug 11 [Epub ahead of print]
Abstract