What influences the implementation of the New Zealand Stroke Guidelines for Physiotherapists and Occupational Therapists?

Suzie Mudge, Sankaran Murugan, Anna Hart and Paula Kersten

This is an Accepted Manuscript of an article published by Taylor & Francis in Disability and Rehabilitation on 4th March 2016, available at: https://doi.org/10.3109/09638288.2016.1146361

What Influences the Implementation of the New Zealand Stroke Guidelines for Physiotherapists and Occupational Therapists?

Suzie Mudge, Centre for Person Centred Research, Auckland University of Technology, Private Bag 92006, Auckland 1142

Corresponding author: suzie.mudge@aut.ac.nz; 64 9 921 9999 X 7096

Anna Hart, Medicine & Health of Older People and Surgical & Ambulatory Services, Waitemata District Health Board, North Shore Hospital, Private Bag, 93503, Takapuna

Sankaran Murugan, Medicine & Health of Older People and Surgical & Ambulatory Services, Waitemata District Health Board, North Shore Hospital, Private Bag, 93503, Takapuna

Paula Kersten, Centre for Person Centred Research, Auckland University of Technology, Private Bag 92006, Auckland 1142

Keywords: guidelines, stroke, New Zealand, physiotherapists, occupational therapists

Words: 4135

Abstract

Purpose: To explore perceived barriers and facilitators to the use of the NZ Stroke Guidelines by occupational therapists and physiotherapists.

Method: A qualitative descriptive methodology was used. Eligible physiotherapists and occupational therapists (NZ registered, working in one of two hospitals, treating at least 10 patients with stroke in the previous year) were invited to participate in semi-structured interviews to elicit their perceptions of the utility and feasibility of the NZ stroke guidelines and identify barriers and facilitators to their implementation. All interviews were audio-recorded and transcribed. Conventional content analysis with constant comparative methods was used for coding and analysis.

Results: The main themes influencing guideline implementation were resources and characteristics of the guidelines, the organisation, the patient and family and the therapist. Insufficient resources were a major barrier that crossed many of the themes. Participants suggested a range of strategies relating to the organisation to improve therapists' alignment to the guidelines.

Conclusion: Alignment to the guidelines in New Zealand is influenced both positively and negatively by a range of interacting factors, consistent with other studies. Alignment might be improved by the introduction of some relatively simple strategies, such as ring-fencing time for access to resources and training in the use of the guidelines. Many of the barriers and related interventions are likely to be more complex.

Implications for Rehabilitation

- Alignment with stroke guidelines has been shown to improve patient outcomes.
- Therapist alignment with implementation of the NZ stroke guidelines is influenced by guideline characteristics, organisational characteristics, resources, patient and family characteristics, and therapist characteristics.
- Frequently encountered barriers related to limited resources, particularly time.
- Ring-fencing regular time for access to resources and training in the use of guidelines are examples of simple strategies that may reduce barriers.

The main purpose of clinical guidelines is to provide a convenient, up to date and unbiased summary of published research that can theoretically be more easily implemented in clinical settings than the original research [1]. Although guidelines provide specific recommendations for rehabilitation, therapists often perceive barriers to the implementation of guidelines and evidence based practice [2,3]. Issues such as therapy selection and prioritisation, provider safety, equipment and space availability and inadequate staffing are some examples of barriers that have been previously identified by rehabilitation therapists [2,3]. One qualitative study investigating the facilitators to physiotherapists' use of evidence based practice found there were a number of facilitators that therapists identified [4]. On an individual level, favourable attitudes toward research use and research related knowledge and skills facilitated the use of evidence based practice. Participants also identified that leadership support, the organisational culture, research related resources and knowledge exchange were factors within the workplace that helped them use research. Extra-organisational factors that were perceived as facilitators were the availability and quality of evidence based practice guidelines, involvement in external meetings, networks and conferences and involvement in academic research and education [4].

All published guidelines for stroke, including the updated New Zealand (NZ) clinical guidelines for stroke [5] consider rehabilitation essential to achieve maximal recovery following stroke. General recommendations for rehabilitation include the amount, intensity and timing of rehabilitation, but more specific recommendations for disciplines such as physiotherapy are included under categories of sensorimotor impairments, physical activity, activities of daily living and managing secondary complications [5]. In a large Australian audit with data from 68 rehabilitation units, patient outcomes were shown to be better when there was a closer alignment to the stroke clinical guidelines [6]. In NZ there have been several calls to similarly implement the national guidelines in order to improve the quality of services and outcomes for people with stroke [7,8]. A recent audit conducted at North Shore Hospital (Waitemata District Health Board) found that alignment to the guidelines relevant to physiotherapy was generally high, particularly for activities of daily living. Other areas, such as

management of swelling, altered sensation, goal setting, education, contracture and falls risk had lower levels of alignment (less than 50%) [9]. It is not known whether the barriers and facilitators to guideline implementation account for the difference in alignment or even whether the New Zealand rehabilitation context is similar to that reported internationally.

The aim of this study was to explore the perceived barriers and facilitators to the use of the NZ Stroke Guidelines experienced by occupational therapists and physiotherapists. The specific objectives of this study were to:

1. Seek therapists' perceptions of the NZ Stroke Guidelines in terms of utility and feasibility.
2. Identify barriers and facilitators to the implementation of the NZ Stroke Guidelines.

Methods

A qualitative descriptive methodology was used in this study. Physiotherapists and occupational therapists were eligible to participate if they were registered for practice in NZ, had worked at one of two hospitals in the previous 12 months and had worked with at least 10 patients with stroke in the previous year.

Ethical approval was gained from the Auckland University of Technology Ethics Committee and informed consent was gained from all participants. Ethical considerations informed the implementation of this study, including maintaining participant anonymity to protect their positions as employees and colleagues, and the interviewers carefully wording questions and responses to avoid participant discomfort.

Data was collected through semi-structured interviews, lasting approximately one hour, conducted in a location of each participant's choosing. The interview questions were informed by a review of the literature and designed to elicit responses about the facilitators and barriers to implementation

of the NZ stroke guidelines, as well as their perceived utility and feasibility. The interviewers (Anna Hart (AH), Sankaran Murugan (SM)) were careful to express their understanding of the difficulties of working in complete alignment with stroke guidelines, in an effort to make the participants more comfortable about expressing their perceptions and experiences.

Prior to each interview, either AH or SM briefly explained the background and aims of the study and clarified that the audit preceding this study only audited physiotherapists' notes [9] and therefore was not necessarily reflective of occupational therapists' practice. Participants were then presented with a list of guideline topics categorised by 'higher overall alignment' and 'lower overall alignment', based on the audit findings of Johnston et al. [9]. The list included a summary of the guideline recommendations for each topic, together with the physiotherapy-related percentage of alignment found during the audit. The physiotherapists and occupational therapists were asked to choose at least two topics from each category to discuss relevant barriers and facilitators to alignment based on the guideline recommendations. This approach was taken to focus discussion on specific aspects of the guidelines, in a way that emphasized both barriers and facilitators. The occupational therapists were interviewed by AH and the physiotherapists were interviewed by SM.

All interviews were audio-recorded and transcribed. The transcript data were manually coded line by line into open codes, which were then grouped into categories and subcategories. Content analysis was chosen to examine the narratives of therapists in an inductive manner [10]. In particular, conventional content analysis was used to identify themes of importance within and across participants, as well as to look for any differences between experiences [11]. Linkages between the themes were also examined. The first two interview transcripts were read and coded by AH and SM to confirm coding decisions. Constant comparative methods involved rechecking and comparing data to check the validity of the conclusions reached.

Findings

Eleven therapists participated (seven occupational therapists and four physiotherapists) each in a single interview. All participants worked with patients with stroke in either an acute or inpatient rehabilitation setting. The main themes influencing guideline implementation, as perceived by the participants, were the guideline characteristics, organisational characteristics, resources, patient and family characteristics, and therapist characteristics. There were barriers and facilitators associated with each of these themes as detailed in the following sections. All quotes are shown in italics and names following the quotes are pseudonyms; disciplines have not been detailed in order to protect anonymity.

Guideline Characteristics

A commonly reported barrier to using the NZ stroke guidelines was the non-specific nature of their recommendations and their "*overwhelming*" size. Charlotte described them as "*very generic… broad, basic statements"* and *"extremely vague".* However, it was also recognised that they were useful for providing therapists with an understanding of the literature that exists on each topic.

> *"[The guidelines are] useful cause you need to know what's out there*." (Georgia)

Certain recommendations were considered difficult to implement unless the therapist was highly skilled.

> *"Some of these interventions are quite complex… it's assuming that you're going to have quite close supervision or that you're already a very experienced therapist."* (Kate)

Recommendations with lower graded supporting evidence were viewed as less important and useful; and therefore participants perceived them to be implemented less frequently.

> *"…a mistrust of the level C grade evidence."* (Dorothy)

Participants shared that they thought the NZ stroke guidelines could be improved by making the recommendations clearer and more specific, and perhaps by incorporating prioritised time-frames

to indicate when each recommendation should be implemented. Additionally, participants believed a condensed version of the NZ stroke guidelines with both specific allied health and setting-specific sections would make them easier to consult and implement.

> *"Is it that the stroke guidelines need to be targeted into the different stages? Because I know what's done on our acute stroke ward is very different to what we're doing in rehabilitation."* (Amelia)

Organisational Characteristics

The influence, both positive and negative, of organizational characteristics on alignment to the guidelines was raised by the majority of participants. Processes and procedures implemented by the organisation influenced individual therapist's practice. For example, routine audits were seen to make alignment easier:

> *"We do that because it's audited because that's kind of what we focus on … it could be argued that there should be more routine auditing of key performance indicators."* (Daniel)

However a few participants felt that their practice was driven by the need to fulfil policy requirements and meet the District Health Board (DHB) expectations, which was viewed as a stronger influence than the NZ stroke guidelines.

> "*I think definitely we probably do more around what the DHB wants us to do in terms of adhering to our policies and procedures than potentially adhering to the… stroke guidelines."* (Sarah)

They suggested this could lead to recommendations being implemented that could be suboptimal for patients:

> "*Fatigue's a really hard one… because there's still expected outcomes that you have to be able to meet and then you're pushing someone through a therapy session that you know is not really in their best interest at that point in time."* (Leah)

This perceived tension challenged therapists' ability to follow the NZ stroke guidelines.

The perceived value of allied health by the organisation was also raised as a potential barrier to alignment:

> *"They open up new beds or new services but they don't think about allied health FTE [full-time equivalent] when they're doing that …allied health does not perhaps have a high enough profile to be considered … new staffing is not brought on board … so your workload increases but they haven't necessarily increased the staffing level so all those things affect the buoyancy and how well staffed a service is and that will directly impact on the ability to be aligned…"* (Daniel)

Such a view is directly related to resources and staffing levels, as will be discussed in the following section.

Resources

Resources were overwhelmingly identified as a factor influencing alignment with the guidelines. Lack of funding for stroke-related resources and staff was perceived to lead to a shortage of rehabilitation beds and insufficient staffing levels required to implement certain recommendations:

> *"…. our caseload staffing ratio, … if you have two to three new patients on the ward, you're going to do an initial, you might not have an hour with all of them… have to prioritise everything… when you have one staff say off sick you end up having a lot extra to manage."* (Amy)

Prioritisation of patients were said to affect which recommendations would be implemented and with whom. Patients requiring therapy most urgently were considered high priorities, whilst patients with minor impairments were considered lower priorities. Participants perceived that it was more difficult to implement the NZ stroke guidelines with patients who were considered to be low priority, as less therapy time was allocated to them. Furthermore, recommendations were prioritised according to their relevance to the patient, with high priority recommendations being implemented first and lower priorities potentially being neglected.

" if [one] goes to the top of the tree I might have to miss out that [other] training… it's the prioritising… and there can be a lot on." (Georgia)

The lack of suitable equipment in working order hampered therapists' ability to implement the guidelines.

"[The acute ward] is really well set up… unfortunately though the rest of the hospital [isn't]." (Sarah)

"… people were put on the course, allowed to up-skill in that area,…wasn't a funding model to get the costing materials to be able to be used … We've got the skills raring to go … we have to beg and steal off other departments to try and get equipment …" (Daniel)

Participants felt it would be useful if the hospital purchased all of the specialist resources required for the recommendations and increased the number of high demand resources available. Increasing the number of hospital beds and introducing slow stream rehabilitation beds or creating an under 65 rehabilitation ward was also considered to make it easier to implement more of the NZ stroke guidelines. Furthermore, participants suggested that a larger team of professionals could allow them to spend more time with each patient:

"*Increasing the…funding for therapists… sometimes it's even if we had more casual staff…someone to be able to lighten that load… always could use more people."* (Leah)

Sharing responsibility with therapy assistants to follow up with patients was also perceived to be helpful, as each patient could receive more therapy time.

"*Once we've done that first assessment… we'd use our therapy assistants to see them daily and to carry on the tasks… so that they keep getting the benefit of practicing."* (Sarah)

Time was frequently mentioned as a barrier to guideline implementation. Heavy case-loads, low staffing levels, and limited working hours were thought to lead to less time with each patient and therefore fewer recommendations could be implemented.

"[Guideline implementation] is actually about having time. So… if there's a push for a discharge… you've got to fully review them … you're not going sit down and do the goals, you just can't." (Amelia)

Participants felt another potential strategy to improve alignment could be to alter practice to allow implementation of multiple recommendations at once or perform them more quickly; however, despite their efforts to make their practice more efficient they still felt unable to address all guideline recommendations with each patient.

Patient and Family Characteristics

Patient buy-in and engagement was identified as an integral factor for implementing any therapy, whilst "*people… choos[ing] not to engage"* (Georgia) was said to be a major barrier. While some patients had the ability to participate in rehabilitation, therapists recognised that poor health status, communication or cognitive abilities limited other patients:

"*[If] the patient is not well or they do not understand… [it] makes it impossible for us to educate at that time."* (Olivia)

Participants also discussed that patients' goals would often drive what the therapists prioritised for their treatment.

"… the patients goal are more functional driven … linked in with those motor deficits rather than the sensational deficits…that could be why there could be less emphasis on the notes or assessment wise on the sensation part …." (Amy)

This could then lead to a lack of alignment to the guidelines since the patient's priorities were not related to the stroke guidelines.

The patient's stage in rehabilitation was thought to affect which recommendations could be implemented. For example, participants felt that only basic recommendations could be implemented in the acute stage:

"*[Patients are] usually so devastated… or in such denial that there is no amount of [complex therapy] that you can do with that person at that point" (Leah).*

Similarly, in later stages of rehabilitation when discharge was imminent, therapists described that the functional goals were prioritised over treatment of impairments:

"We are in a short stay rehab ward … you're trying to get them to a level where they're safe and can function at home with supports." (Andrea)

Involving families in rehabilitation was thought to either help or hinder guideline implementation. Effective family involvement was said to be useful, as families could continue rehabilitation outside of therapy sessions:

"Sometimes [involving family in rehabilitation] is absolutely brilliant…and we're just enabling somebody to put in the rehabilitation." (Amelia)

But other families were perceived to have a negative influence by either pushing the patient too hard or insisting that they rest rather than participate in therapy. Sometimes family were not available at times convenient for the therapists:

"*It's really hard to get hold of the families sometimes when you're trying to structure your day around so many different variables."* (Charlotte)

Therapists also identified expectations of families could act as a barrier to guideline implementation, for example if families believed the patient was sick and needed rest rather than active rehabilitation. Furthermore, the logistical load therapists faced to meet, involve and communicate with families in addition to their other responsibilities and roles impacted guideline implementation.

Therapist Characteristics

Individual knowledge

Generally, participants described that their knowledge, awareness of common conditions seen in stroke patients, knowledge of the processes to obtain the right resources for treatment such as equipment and knowledge sharing amongst the team were factors that helped them align their

treatment to the NZ stroke guidelines. Most participants felt that their knowledge of the NZ stroke guidelines had predominantly resulted from participation in professional courses (e.g. post-graduate education and conferences), which had endorsed guideline use. Professional courses also taught therapists the skills required to implement complex or specialist recommendations; however participants reported that there were not enough courses available on all guideline topics. Therapists felt that their knowledge and experience shaped which guidelines they incorporated into treatment, clearly indicating that lack of knowledge about certain guidelines precludes their use. Reminders and meetings about the NZ stroke guidelines were thought to increase awareness, however it was said that this rarely occurred on a regular basis:

> *"We had emails and… talked about them in the stroke journal club, but it's not a consistent thing, it was just because they were new [then]."* (Charlotte)

Participants suggested that on-going training for therapists to learn about complex therapies and protected time to read the NZ stroke guidelines would be helpful. Kate suggested initiating a brainstorming session with occupational therapists and physiotherapists to share their knowledge and ideas about how they could better implement the NZ stroke guidelines in a non-judgemental setting:

> "*One thing is find a structured way for us to sit down and read about the guidelines… Second thing is find a way for us to sit down with the OTs and PTs from [both hospitals], so we can actually talk about what we do and…what we want to try… it has to be a safe environment in order for us to share those ideas."* (Kate)

Both practice to lead to confidence and training opportunities were seen as ways to address most of the barriers in this area.

> *"…giving them the confidence to practice that as well because if you don't do it you don't feel confident with it but once you've done one or two times you feel better."* (Georgia)

However, applying for formal courses was often a difficult process for therapists, which limited their opportunities for education.

"…the current staff needs more training in the area… the external courses process you have to fill in a really lengthy and detailed form." (Amy)

Professional roles

Participants explained that physiotherapy and occupational therapy had different scopes of practice, leading to different recommendations applying to different disciplines. Where these scopes of practice overlapped it was thought that recommendations could be neglected, due to the uncertainty between the two professions about who was responsible for implementation.

"*Contracture [management] always falls between the cracks, because… OTs do splinting, but physios do range of movement."* (Kate)

It was thought that sharing responsibility for implementing recommendations and working collaboratively might address this barrier:

"Y*ou need teamwork… communication with colleagues… [and] an interdisciplinary and collegial approach."* (Georgia)

"...when it's done well, it's a real MDT [multidisciplinary team] approach and when you've got the whole team sitting down there working out that daily time tables, structuring showers around SLT, OT, PT…" (Georgia)

Occupational therapy participants described that the occupational therapy models of practice and beliefs were the main influencers on their clinical practice, which were not always perceived to be congruent with the NZ stroke guidelines. For example, instead of performing mirror therapy, which Kate considered to be *"isolationist"*, she would:

"*…do bilateral hand tasks within an everyday functional [activity]… because that's our models and… practice beliefs."* (Kate)

Recommendations which participants considered congruent with their practice models were thought to be more easily implemented.

Discussion

This study investigated the influences on therapists' ability to implement the NZ stroke guidelines in clinical practice within two Auckland-based hospitals. Although the NZ context of this study is unique, the key findings that guideline characteristics, hospital policies, resources, patient and family characteristics and therapist characteristics are all influential factors in guideline implementation are consistent with international studies with a variety of health professional participants [3,12-16]. Similarly, influencing factors were often described as a barrier or facilitator to guideline implementation depending on the context. Interestingly, participants seemed to be able to identify more barriers to guideline implementation than facilitators, often focussing on what hindered their ability to practice in alignment with the NZ stroke guidelines.

Insufficient resources to allow for thorough guideline implementation was a main barrier that has been widely recognised in previous research and is often attributed to a lack of funding. These resources could include inadequate staffing, physical resources (e.g. equipment and hospital beds), and time [3,13,15,16]. Lack of time was frequently mentioned as a barrier and has consistently been reported as a major influencing factor throughout relevant literature. In particular, therapists identified that they had insufficient time both to read and to implement all recommendations [3]. Low levels of staffing can result in a high caseload with limited time spent with individual patients, but frequent turnover of staff also impacts on a loss of experience in the clinical team, which compounds the time taken to complete activities. This has not been previously identified specifically in literature but can be inferred when considering the impact of the barriers to guideline implementation [13].

McClusky et al. found that a range of health professionals recognised that their knowledge, skills, role identities, and beliefs about guidelines affected their ability and motivation to implement guideline recommendations [13]. Guideline characteristics have also been recognised as a barrier to therapists' knowledge [14]. These findings were echoed by our participants, who felt that the NZ

stroke guidelines were generally neither user-friendly nor informative, leading to less familiarity with the content.

A barrier of interest perceived by the majority of participants was the lack of support or encouragement within the hospital system for therapists to use the NZ stroke guidelines in their daily practice. Participants felt a greater need to practice according to hospital policies, which at times, created a tension with following the guidelines, suggesting that perhaps these two hospitals do not consistently advocate for guideline implementation in a way that is recognised by therapists. It could be argued, for instance, that guideline implementation to provide evidence based practice may be a means of meeting hospital expectations of improved patient outcomes and shorter stays [6,17], but the link could be made more explicit to clinicians. Supportive advocates to encourage guideline implementation is also a proposed strategy [6,18].

It is potentially useful for organisations to consider strategies to increase therapists' awareness of stroke guidelines. Addressing the barriers identified by therapists could be integral to making it possible for more recommendations to be implemented, although this is a more complex issue than simply buying equipment or employing more staff. However, it is possible that some simple first steps towards minimising the barriers and encouraging the facilitators for guideline implementation, such as ring-fencing regular time for access of resources and training in use of guidelines may lead to higher levels of alignment with the NZ stroke guidelines in therapists' practice. Implementation of such strategies could be initially tested by an audit. Knowledge translation is an emerging field, which highlights the complex interactions between individuals, the guidelines (intervention) and the organisation as articulated by our participants, however a recently developed framework also describes the influence of the outer setting (for example, health funding decisions, professional culture) and the process of implementation, neither of which were discussed by our participants [19]. The process of implementation, such as knowledge brokering or tailored messages [20], should also be considered as potential strategies to increase alignment with the stroke guidelines.

Limitations of the Study

We conducted our recruitment and interviews over the summer holiday period when staffing levels were low. As a result, a number of therapists may not have had the opportunity to participate in this study due to being away from work or having especially heavy case-loads that disallowed for time for an interview. We also only interviewed physiotherapists and occupational therapists; it would have been beneficial to interview all members of the MDT to gain further insight to what influences the implementation of the NZ stroke guidelines for therapists of other disciplines. We also acknowledge that a small number of physiotherapists, in particular, participated and so the views expressed may not be reflective of all physiotherapists.

Our approach in discussing areas of higher and lower overall alignment with the NZ stroke guidelines [9] was used in an attempt to elucidate both barriers and facilitators in relation to specific guidelines. Although relevance to the context was our intention, it may have been perceived critically by some participants, which may have limited free expression.

Conclusions

Participants perceived a number of facilitators as encouraging guideline implementation whilst many more barriers were identified as hindering implementation. The most significant barriers to implementation included participants not knowing, using, or finding the guidelines useful in their daily practice; having inadequate resources and time to implement recommendations; and not having the knowledge or skills to competently implement complex recommendations. Main facilitators that could be encouraged in the workplace included professional courses teaching about how to implement certain recommendations; communication and support between MDT members for sharing ideas, knowledge and encouraging alignment of practice with the NZ stroke guidelines; and having access to sufficient resources.

Acknowledgements

We would like to acknowledge the time given by all the participants.

Declaration of Interest statement

The authors report no conflicts of interest.

Funding

At the time of this research, Suzie Mudge was the recipient of a post doctoral research fellowship funded by the Waitemata District Health Board. Anna Hart and Sankaran Murugan were recipients of Waitemata District Health Board Summer Research Awards at AUT University.

References

1. Hill K, Lalor E. Clinical guidelines for stroke care: why the fuss and is there opportunity for collaboration? Int J Stroke 2008;3:173-174.
2. Graham F, Robertson L, Anderson J. New Zealand occupational therapists' views on evidence-based practice: A replicated survey of attitudes, confidence and behaviours. Aust Occup Ther J 2013;60:120-128.
3. Bayley MT, Hurdowar A, Richards CL, Korner-Bitensky N, Wood-Dauphinee S, Eng JJ, McKay-Lyons M, Harrison E, Teasell R, Harrison M and others. Barriers to implementation of stroke rehabilitation evidence: findings from a multi-site pilot project. Disabil Rehabil 2012;34:1633-1638.
4. Dannapfel P, Peolsson A, Nilsen P. What supports physiotherapists' use of research in clinical practice? A qualitative study in Sweden. Implement Sci 2013;8.
5. Stroke Foundation of New Zealand, New Zealand Guidelines Group. Clinical Guidelines for Stroke Management 2010. Wellington: Stroke Foundation of New Zealand; 2010.
6. Hubbard IJ, Harris D, Kilkenny MF, Faux SG, Pollack MR, Cadilhac DA. Adherence to clinical guidelines improves patient outcomes in Australian audit of stroke rehabilitation practice. Arch Phys Med Rehabil 2012;93:965-971.
7. Gommans J, Barber PA, Hanger HC, Bennett P. Rehabilitation after stroke: changes between 2002 and 2007 in services provided by district health boards in New Zealand. NZMJ 2008;121:26.
8. Gommans J, Barber A, McNaughton H, Hanger C, Bennett P, Spriggs D, Baskett J. Stroke rehabilitation services in New Zealand. NZMJ 2003;116:U435.
9. Johnston J, Mudge S, Kersten P, Jones A. Physiotherapy Alignment with Guidelines for the Management of Stroke in the Inpatient Setting. NZJP 2013;41:102-111.
10. Vaismoradi M, Turunen H, Bondas T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. Nursing & health sciences 2013;15:398-405.

11. Hsieh H-F, Shannon SE. Three Approaches to Qualitative Content Analysis. Qual Health Res 2005;15:1277-1288.

12. Van Der Weijden T, Hooi JD, Grol R, Limburg M. A multidisciplinary guideline for the acute phase of stroke: barriers perceived by Dutch neurologists. J Eval Clin Pract 2004;10:241-246.

13. McCluskey A, Vratsistas-Curto A, Schurr K. Barriers and enablers to implementing multiple stroke guideline recommendations: a qualitative study. BMC Health Serv Res 2013;13:323.

14. Donnellan C, Sweetman S, Shelley E. Implementing clinical guidelines in stroke: a qualitative study of perceived facilitators and barriers. Health Policy 2013;111:234-244.

15. Hadely KA, Power E, O'Halloran R. Speech pathologists' experiences with stroke clinical practice guidelines and the barriers and facilitators influencing their use: a national descriptive study. BMC Health Serv Res 2014;14:110-110.

16. Otterman NM, van der Wees PJ, Bernhardt J, Kwakkel G. Physical therapists' guideline adherence on early mobilization and intensity of practice at Dutch acute stroke units: a country-wide survey. Stroke 2012;43:2395-2401.

17. Dijkers MP, Murphy SL, Krellman J. Evidence-based practice for rehabilitation professionals: concepts and controversies. Arch Phys Med Rehabil 2012;93:S164.

18. Nilsagård Y, Lohse G. Evidence-based physiotherapy: A survey of knowledge, behaviour, attitudes and prerequisites. Adv Physiother 2010;12:179-186.

19. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implement Sci 2009;4:50.

20. Dobbins M, Hanna SE, Ciliska D, Manske S, Cameron R, Mercer SL, O'Mara L, DeCorby K, Robeson P. A randomized controlled trial evaluating the impact of knowledge translation and exchange strategies. Implementation science : IS 2009;4:61-61.