

Rehabilitation Research Review

Making Education Easy

Issue 8 – 2009

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Welcome to the eighth issue of Rehabilitation Research Review.

One of the reviews profiled in this issue highlights the usefulness of cognitive strategies that help post-stroke patients acquire motor skills and posits that such interventions deserve further consideration for improving long-term stroke outcomes. Another paper discusses ethics and goal planning with a particular focus on utilitarianism as a useful approach.

I hope the issue is of interest and I welcome your comments and feedback.

Kind regards,

Kath McPherson

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Participation in life situations of 8-12 year old children with cerebral palsy: cross sectional European study

Authors: Fauconnier J et al

Summary: Researchers in this study evaluated a total of 1174 European children aged 8–12 years with a cerebral palsy. Parents and children were both interviewed about their involvement in 10 main fields or domains of daily life such as mealtimes, communication, relationships, school and recreation. They were also questioned about demographics, employment, level of educational qualifications, and whether they resided in rural or urban areas. Children with pain and those with more severely impaired walking, fine motor skills, communication and intellectual abilities had considerably less involvement on most domains. Even after controlling for severity of impairment, soreness was strongly connected with lesser levels of participation. After adjusting for impairment and pain, the difference in regions on the participation on all domains varied substantially. Danish children had much higher participation than children in all the other regions.

Comment: Assessing participation is increasingly proposed as important and so it is of interest to see the results of this study outlining the impact of geographical location in relation to levels of participation. A paper reviewing the psychometric properties of the measure (Assessment of Life Habits [LIFE-H]) in children can be found elsewhere (Developmental Medicine & Child Neurology 49 (9), p 666 – 671) and whilst I have not used this measure, it seems worth a look. It would be interesting to see how NZ compares with our European counterparts on facilitating participation for children with cerebral palsy and other disabling neurological conditions.

Reference: *BMJ* 2009;338:b1458.

http://www.bmj.com/cgi/content/abstract/338/apr23_2/b1458

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Rasch analysis of 24-, 18- and 11-item versions of the Roland-Morris Disability Questionnaire

Authors: Davidson M

Summary: These researchers examined fit of the original 24-item Roland-Morris Disability Questionnaire and three short-form versions to a Rasch model with particular attention to targeting of item difficulty and to differential item functioning. Data from a cross-sectional survey of 140 people with low back pain seeking physiotherapy treatment were analysed using a dichotomous Rasch model. All versions showed adequate overall data fit to the Rasch model, with few misfitting items. Person separation was around 0.85 for all versions. Item 5 (use a handrail to get upstairs) showed differential item functioning by age. Targeting of persons of high ability was poor and short-form versions also had poor targeting of persons of low ability. Items of similar difficulty clustered in the centre of the logit scale.

Comment: Rasch analysis is increasingly used to evaluate new measures as well as those that have been around for some time as is the case here. These findings suggest this well-used measure is good but has limited value for those with less significant functional deficit. One size of measure is never going to fit all so we should probably expect results like this and ensure we use the right measure for the right population in the right circumstance if we want useful information.

Reference: *Qual Life Res.* 2009;18(4):473-81.

<http://tinyurl.com/qxgqaj>



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How effective are patient-based educational interventions in the management of cancer pain? Systematic review and meta-analysis

Authors: Bennett MI et al

Summary: This systematic review and meta-analysis of outcomes from 15 clinical trials compared intervention (formal instruction on cancer pain and analgesia on an individual basis using any medium) to usual care or other control in adults with cancer pain. Compared to usual care or control, educational interventions improved knowledge and attitudes by half a point on a 5-point rating scale (weighted mean difference 0.52), reduced average pain intensity by over one point on a 10-point rating scale (WMD -1.1) and reduced worst pain intensity by just under one point (WMD -0.78). There was equivocal evidence for the effect of education on self-efficacy, but no significant benefit on medication adherence or on reducing interference with daily activities.

Comment: I read a study some time back claiming 'advice and information' was more effective than physiotherapy for low back pain (BMJ 2004;329:708). I thought then *but surely – much of physiotherapy is about advice and information so really what the study has shown is that a brief intervention of advice and information from a physiotherapist is effective and that's a good thing rather than what seems a negative spin*. Key to any effect is, I suspect, ensuring the educator is skilled in helping people 'get' the message and, as we have touched upon in other RRR's, in establishing a relationship of trust. So this paper reiterates an important message – education is not a soft and woolly intervention. It's a powerful tool and should be considered as such.

Reference: *Pain.* 2009;143(3):192-9.

[http://linkinghub.elsevier.com/retrieve/pii/S0304-3959\(09\)00045-1](http://linkinghub.elsevier.com/retrieve/pii/S0304-3959(09)00045-1)

Association of insomnia with quality of life, work productivity, and activity impairment

Authors: Bolge S et al

Summary: Data from 19,711 adults participating in the 2005 US National Health and Wellness Survey were examined to assess the association of insomnia with health-related quality of life (HRQL), work productivity, and activity impairment. Subjects were assigned to the insomnia group (diagnosed insomnia experienced at least a few times a month; n=5161) or the noninsomnia group (no insomnia or sleep symptoms; n=14,550). Compared with non-insomnia, insomnia was associated with significantly lower Short Form 8 Health Survey physical (-5.40) and mental (-4.39) scores and greater activity impairment scores (+18.04) (p<0.01 for all). The work productivity and activity impairment questionnaire revealed that employed subjects in the insomnia group had significantly greater absenteeism (work time missed; +6.27), presenteeism (impairment at work; +13.20), and work productivity loss (overall work impairment; +10.33) scores than those in the noninsomnia group (p<0.01 for all).

Comment: The more I think about this, the more I think addressing sleep disturbance is a key issue in rehabilitation. This paper gives even more reason to deal with it as the deficits outlined above clearly exacerbate the disadvantage disabled people already experience. Put that together with the fatigue that marks out many conditions and no wonder 'recovery' can be tough. Improving the quality of sleep for our patients and clients should arguably be a high priority.

Reference: *Qual Life Res.* 2009;18(4):415-22.

<http://www.springerlink.com/content/q77664125pk1743u/>

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Ethics in goal planning for rehabilitation: a utilitarian perspective

Authors: Levack WM

Summary: This author discusses the rationale for favouring a utilitarian approach to goal planning. The researcher states that clinicians are ethically obliged to take into account the resource implications of goal planning. Utilitarianism allows such issues to be addressed. Taking a utilitarian approach to goal planning would mean focussing on maximising the benefits of rehabilitation to the whole community served when negotiating goals with individual patients. The researchers acknowledge that clinicians may have a number of concerns about utilitarianism. One assumption could be that the quality of life of people with severe disability will be judged as being intrinsically low, and therefore valued less from a utilitarian perspective. A second assumption is that for people with severe disability the large effort expended in rehabilitation to achieve small gains cannot possibly repay itself in a utilitarian equation, specifically in financial terms. However, neither of these assumptions is supported by evidence from the literature.

Comment: Goal setting is increasingly recognised as being far more complex and far more difficult for clients and professionals than is often assumed. This paper tackles just one of those complexities (ethics) and is one of a whole series of papers looking at goals and goal setting in this special issue of *Clinical Rehabilitation* (including one paper from our team). I came across an interesting challenge to utilitarianism when I was reading around this area trying to work out what I really thought. Amartya Sen proposed something called Capability Theory, which focuses less on *utility* (the end product of 'happiness' or any other benefit for the majority) and more on egalitarian access to *capabilities* or opportunities for people to achieve things they can and want to achieve. I'm going to think more on this and the challenges Capability Theory offers not just to utilitarianism but to rehabilitation more generally.

Reference: *Clin Rehabil.* 2009;23(4):345-51.

<http://cre.sagepub.com/cgi/content/abstract/23/4/345>

Long-term outcome following total knee arthroplasty: a controlled longitudinal study

Authors: Cushnaghan J et al

Summary: To assess long-term outcome and predictors of prognosis following total knee arthroplasty (TKA) for osteoarthritis, 325 patients from 3 English health districts were followed-up approximately 6 years after TKA, as were 363 controls selected from the general population. Between baseline and follow-up, median Short Form 36 Health Survey (SF-36) physical function scores improved by 6 points in patients, but worsened by 14 points in controls ($p < 0.001$). Median SF-36 vitality score decreased by 10 points in patients and 5 points in controls ($p = 0.005$); corresponding median SF-36 mental health scores improved by 12 and 13 points, respectively ($p = 0.2$). While improvements in physical function were smaller in obese versus non-obese patients, they compared favourably with a substantial decline in the physical function of obese controls. Better baseline physical function and older age predicted worse changes in physical function in patients and controls. Greater improvement in physical function was seen in patients with more severe radiological disease of the knee; less was seen in those who reported pain at other joint sites at baseline.

Comment: Being obese is a problem for all sorts of health-related reasons but one of them shouldn't be missing out on appropriate surgery for osteoarthritis of the knee. Sadly the data did not include BMI at follow-up but one suspects the increased physical health reported may also have been linked to greater activity and . . . a reduction of BMI in those who were obese preoperatively. Now before you think I am suggesting surgery on the knee as a weight loss strategy (I'm not), I am suggesting that reducing the risk of obesity-related disease for people with pre-existing disability is important and it's good to see papers like this challenging some assumptions. Hmmm . . . perhaps a case of Capability Theory over Utilitarianism . . . (see Levack et al in the paper above).

Reference: *Ann Rheum Dis.* 2009;68:642-7.

<http://ard.bmj.com/cgi/content/abstract/68/5/642>

Cognitive strategy use to enhance motor skill acquisition post-stroke: A critical review

Authors: McEwen S et al

Summary: This review critically examined the evidence regarding the use of cognitive strategies to acquire motor skills in patients post stroke, to determine which strategies are in use and to compile evidence of their effectiveness. Of a total of 26 articles reviewed, seven investigated general cognitive strategies and 19 investigated task-specific strategies. The most commonly studied task-specific strategy was motor imagery. General strategy training can improve performance in both trained and untrained activities compared to traditional therapy and a specific motor imagery protocol can improve mobility and recovery in the affected upper extremity in those living with the chronic effects of stroke.

Comment: This is a useful review highlighting how powerful cognitive strategies (in particular motor imagery) can be for motor tasks. Mental rehearsal and imagery are common strategies in sports training but this paper emphasises the positive impact for people with stroke and other work highlights similar potential value in other conditions. One of the things I think is interesting about this is that although we know there is a 'dose – response' issue in rehabilitation, many people are getting a lower dose of therapy than we would want due to funding or capacity issues. These strategies, if well taught and appropriately managed, may offer very real opportunities for more time on therapy than can currently be provided.

Reference: *Brain Inj.* 2009;23(4):263-77.

<http://tinyurl.com/ozffkk>

Independent commentary by Professor Kath McPherson, Professor of Rehabilitation (Laura Fergusson Chair) at the Health and Rehabilitation Research Centre, AUT University in Auckland.

Kath has been at AUT since 2004 and has been building a research, teaching and consultancy programme focused on improving interventions and outcomes for people experiencing disability.



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Brain activations in errorless and errorful learning in patients with diffuse axonal injury: A functional MRI study

Authors: Ueno H et al

Summary: Functional magnetic resonance imaging (fMRI) was employed in this study to compare brain activations in errorless learning (EL) and errorful learning (EF) in 13 patients with diffuse axonal injury (DAI). Thirteen healthy individuals served as controls. Participants learned words under the EL and EF conditions in advance and performed the recognition task during fMRI scanning. Whereas EL in the control group was significantly faster than EF ($p=0.005$), this was not the case for the DAI group. EL in the DAI group scored significantly higher than EF ($p=0.026$). An fMRI showed significant activations in the posterior cingulate gyrus (BA 31) and precuneus (BA 7) in the control group when $EF > EL$, but in the precuneus (BA 7, 31) and bilateral inferior parietal lobules (BA 39, 40) in the DAI group.

Comment: Seeing the changes that occur in the brain with technology like fMRI with rehabilitation interventions is incredibly exciting. As the authors say, the findings highlight a number of important things about the plasticity of the brain and the benefit of errorless learning. For me – a key finding is that what some might consider relatively minor rehabilitation strategies result in changes to brain activity and this is something that has real relevance for finding out more about how rehabilitation works.

Reference: *Brain Inj.* 2009;23(4):291-8.

<http://tinyurl.com/oewj9e>

Disclaimer: This publication is not intended as a replacement for regular medical education but to assist in the process. The reviews are a summarised interpretation of the published study and reflect the opinion of the writer rather than those of the research group or scientific journal. It is suggested readers review the full trial data before forming a final conclusion on its merits.

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Towards an understanding of fatigue in Parkinson disease

Authors: Hagell P and Brundin L

Summary: 118 patients with Parkinson's disease (PD) were assessed regarding fatigue, demographics and a wide range of non-motor and motor symptoms, in order to improve understanding of PD-related fatigue. Fatigue was associated with increasing Hoehn & Yahr stages, specifically the transition from stages I-II to stages III-V. Five variables independently explained 48% of the variance in fatigue scores: anxiety, depression, lack of motivation, Unified PD Rating Scale (UPDRS) motor score and pain. Amongst individual motor symptom clusters instead of the UPDRS motor score, axial/postural/gait impairment was the only cluster associated with fatigue.

Comment: Tiredness and fatigue probably seem 'usual suspects' in RRR, but given the findings of this paper (i.e. how common, how disabling, and how poorly managed it is in Parkinson's disease) perhaps this is a good thing. This study advances our understanding of the presentation of fatigue in PD but makes it clear we have a way to go in relation to appropriate management. As the authors highlight, the cause of fatigue and its management should be linked, rather than having a common sense approach (or none at all) prevailing. A bit more work to do then . . .

Reference: *J Neurol Neurosurg Psychiatry.* 2009;80(5):489-92.

<http://jnnp.bmj.com/cgi/content/abstract/80/5/489>

VINTAGE PAPER

Integration of psychological and physiological understandings of disease

Authors: Editorial

Summary: This editorial discusses the growth of psychopathology, in particular drawing out how psychological and physiological aspects of disease (in this case of 'nervous disorders') are often interlinked. The editor outlines various schools of thought that are variously influenced by these authorities. The article acknowledges the conflicting opinions among all these schools, but also notes their shared common ground; the recognition that the different forms of psychotherapy treat forms of psychological disorder. The article expresses the hope that all facets of any psychological disorder (whether they be chemical, anatomical, physiological, or psychological), will be regarded as being biological reactions to the environment and that all of these facets will correlate with one another in treatment.

Comment: The Journal of Neurology Neurosurgery and Neuropsychiatry used to be called the Journal of Neurology and Psychopathology and this paper was in the very first issue and is still available on-line (I wish other journals had such good archives!). In essence, this paper calls for cross-disciplinary contribution to considering a patient's psychopathology. My favourite paragraph (and there are a few) is:

So long as psychology was dominated by sterile academic conceptions, no fruitful application to the problems of practical medicine was possible, and such an application had to await the advent of a psychology in touch with the actual realities of life.

Although written nearly 90 years ago, this remains an eloquent challenge to academic thinking and practice.

Reference: *J Neurol Psychopathol.* 1920;s1-1:69-71.

http://jnnp.bmj.com/cgi/pdf_extract/s1-1/1/69

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