

ESSENTIAL ARTICLES OF PM&R

RESEARCH

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Small sample research designs for evidence-based rehabilitation: Issues and methods.

Graham JE, Karmarkar AM, Ottenbacher KJ. *Archives of Physical Medicine and Rehabilitation* 2012;93(8):S111-S116. *Excellent paper with ideas for conducting pragmatic studies in clinical rehabilitation situations.*

Conducting systematic evidence reviews: Core concepts and lessons learned.

Brown PA, Harniss MK, Schomer KG, Feinberg M, Cullen NK, Johnson KL. *Archives of Physical Medicine and Rehabilitation* 2012;93(8):S177-S184. *Any physician, even those who may never enter the "research realm" after residency, should at least have a decent knowledge of trial designs and systematic reviews.*

Design and implementation of clinical trials in rehabilitation research.

Hart T, Bagiella E. *Archives of Physical Medicine and Rehabilitation* 2012;93(8):S117-S126. *Great overview that any physiatrist would benefit from reading.*

A power primer.

Cohen J. *Psychological Bulletin* 1992;112(1):155-159. *This is a short, excellent paper on estimating a-priori power written by one of the great minds of statistical analysis, Jacob Cohen, whose textbook - Statistical Power Analysis for the Social sciences – remains a must-read. The user friendly sample size/power tables are extremely handy.*

Developing and evaluating prediction models in rehabilitation populations.

Seel RT, Steyerberg EW, Malec JF, Sherer M, Macciocchi SN. *Archives of Physical Medicine and Rehabilitation* 2012;93(8):S138-S153.

The following section consists of 5 pairs of papers. Each pair is intended to be dyadic and complementary. The first paper (bolded) in each pair is an article discussing a specific statistical technique, methodology or research issue. The second article was selected to provide a pragmatic example of the statistical technique, methodology or research issue presented in the first article. For example, the paper by Haley and Frigala-Pinkham provides theory about measurement error and variability and recommendations for interpreting change scores and their clinical significance for providers, researchers and consumers. The study by Steffen and Seney aims to distinguish between clinically significant

change and change due to measurement error for various widely used standardized mobility and timed performance tests including the Berg Balance Scale, Romberg Test, six minute walk test and timed up and go test. We hope that presenting the lessons in this dyadic format will add to the enjoyment, relevance and benefit.

1. Interpreting change scores of tests and measures used in physical therapy.

Haley SM, Fragala-Pinkham MA. Physical Therapy 2006;86:735-743.

Test-retest reliability and minimally detectable change on balance and ambulation tests, the 36-Item Short Form Health Survey, and the unified Parkinson disease rating scale in people with parkinsonism.

Steffen T, Seney M. Physical Therapy 2008;88(6):733-746

2. Measuring quality of life – Methodological issues.

Dijkers M. American Journal of Physical Medicine and Rehabilitation 1999;78(3):286-300.

Life satisfaction after traumatic brain injury.

Corrigan JD, Bogner JA, Mysiw WJ, Clinchot D, Fugate L. Journal of Head Trauma Rehabilitation 2001;16(6):543-555.

3. How to assess the reliability of measurements in rehabilitation.

Lexell JE, Downham DY. American Journal of Physical Medicine and Rehabilitation 2005;84(9):719-723.

How active are people with stroke? Use of accelerometers to assess physical activity.

Rand D, Eng JJ, Tang PF, Jeng JS, Hung CY. Stroke 2009;40(1):163-168.

4. The k statistic in rehabilitation research: An examination.

Tooth LR, Ottenbacher KJ. Arch Phys Med Rehabil 2004;85:1371-6.

The intra- and interrater reliability of the action research arm test: A practical test of upper extremity function in patients with stroke.

Van der Lee JH, De Groot V, Beckerman H, Wagenaar RC, Lankhorst GJ, Bouter LM. Arch Phys Med Rehabil 2001;82(1):14-19.

5. Developing, testing, and sustaining rehabilitation interventions via participatory action research.

Ede DM, Wegener ST. Williams RM, Ephraim PL, Stevenson JE, Isenberg PJ, MacKenzie EJ. Archives of Physical Medicine and Rehabilitation 2013;94(1):S30-S42.

TBI-QOL: Development and calibration of item banks to measure patient reported outcomes following traumatic brain injury.

Tulsky DS, Kisala PA, Victorson D, Carlozzi N, Bushnik T, Sherer M, Choi SW, Heinemann AW, Chiaravalloti N, Sander AM, Englander J, Hanks R, Kolakowsky-Hayner S, Roth E, Gershon R, Rosenthal M, Cella D. J Head Trauma Rehabil 2015 Apr 29 [Epub ahead of print].