J Rehabil Med 2011; 43: 757–759

EDITORIAL

ASPECTS ON THE RESEARCH FIELDS "FROM CELL TO SOCIETY", CLINICAL TRIALS AND RESEARCH METHODOLOGY, AND REPORT ON IMPACT FACTORS

Research fields within rehabilitation – "from cell to society"

A unifying model for the conceptualization, organization and development of human functioning and rehabilitation research was published as a Special Issue in the *Journal of Rehabilitation Medicine* (JRM) in 2007 (vol. 39, no. 4). A comprehensive structure for research in these fields was proposed (1); termed "from cell to society". It covered biosciences in rehabilitation ("cell") and human functioning sciences ("society") as basic sciences (although human functioning sciences also has some applied aspects), and biomedical rehabilitation sciences and engineering, integrative rehabilitation sciences, and professional rehabilitation sciences (how best to provide care) as applied sciences. Since the beginning of 2010 papers published in JRM have been categorized according to these 5 scientific fields. However, we remain unclear of the response from readers and authors, as few comments have been received. Is this structure useful and of benefit? Comments can be sent to the Editor via the editorial office, or as formal Letters to the Editor for publication. It would be enormously helpful to receive more responses to this publication trial.

It may be argued that all of these 5 fields belong to what should be published in a rehabilitation medicine journal, and, to a certain extent this is true, even if in a clinical journal priority may be given to papers in biomedical rehabilitation sciences, integrative rehabilitation sciences, professional rehabilitation sciences and clinically oriented papers in human functioning studies. Most papers submitted to JRM fall into these first 2 categories, as also papers on human functioning sciences particularly follow-up studies on functioning and disability in various patient groups from the rehabilitation field and epidemiological studies on disability. Studies to be published within human functioning sciences ought to have clear connection to clinical rehabilitation. For other reports within that field there are alternatives for publication. In recent years we have published a few studies within biosciences in rehabilitation; studies both in humans and animals, and we intend to increase publication in this area if we receive high-quality manuscripts from experimental studies with clear relevance to clinical rehabilitation. We invite submissions in this field. To note is that in 2003 (before these concepts were developed) we published a Special Issue of papers from a symposium on the neurobiological background to rehabilitation (Supplement 41). We also lack reports from the field of health economics, including cost-effectiveness studies in rehabilitation.

Clinical trials and research methodology

Evidence-based medicine emerged in the 1990s, but reached physical and rehabilitation medicine only fairly recently. Randomized controlled trials (RCT) are considered to provide the best support for novel interventions and for critical analysis of established treatment procedures. In order to enforce evidence-based rehabilitation there is a need for more clinical trials in rehabilitation, and, although there are specific problems in performing "true" RCT, the journal will give priority to such reports. As in many other clinical disciplines, a number of treatment modalities are based on clinical experience rather than on a truly scientific evidence-base; however, they may be useful and give positive results. They may, however, in some instances be based on limited or irrelevant clinical experience and may require more thorough research evaluation.

Clinical trials can be divided into quasi-experimental studies (observation studies) and RCTs. Observation studies may be more useful for describing the "natural" history of a condition, for making comparisons between subgroups and different types of management, and, in particular, for exploring the risk factors and particular outcomes rather than for comparing different interventions. Observation studies cannot reach the same strength of conclusions as RCTs.

In order to explore the feasibility and principal effects of an intervention in a pilot study the single-case design may be used. After establishing a baseline, changes are studied with serial observations. This design may be of value, and sometimes may be the only way, to study rare conditions or, when there are ethical or practical problems, to obtain a large enough sample for a study with a control group. In addition, studies using qualitative methodology would be appropriate in rehabilitation research, in order to identify a problem, especially from the point of view of the patient or interventionist, to provide background information for developing research hypotheses and questions, and for instrument design.

In rehabilitation research it may be difficult to find a randomized control group, especially when studying an already-established intervention. A study with a non-randomized control group, for example, from another clinic, or "historical" controls, then has to be performed, bearing in mind and always discussing the limitations of such a study.

In designing and reporting an RCT it is of importance carefully to follow standardized recommendations, for example from CONSORT (Consolidated Standards of Reporting Trials) (2). Reporting the study in advance to a public trials registry, such as ClinicalTrials.gov, is strongly recommended; this will not only increase transparency, but will also ensure that the initial design is followed in the study.

In clinical rehabilitation research there are definitely several limitations in "true" RCTs, which are double-blinded. One can seldom achieve a placebo treatment that is unknown to both the therapist and the patient, unless it involves a drug treatment or injection, as both will usually be aware of the treatment. It is important that the person or the team administrating the intervention to a "control" group have a positive attitude to the treatment, for example, a conventional treatment compared with a new modality. It is of utmost importance that there is

© 2011 The Authors. doi: 10.2340/16501977-0863

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a non-biased (blinded) assessor(s) of the different groups. Without that premise such a study would not be publishable. Other aspects of RCT in rehabilitation that have to be taken into consideration include treatment fidelity, treatment delivery, treatment receipts, and treatment enactment (3). The need for a sufficiently large sample (always with a power analysis) may require multicentre studies. Such studies are encouraged, even between different countries. The practical problems involved in organizing and standardizing such studies, however, have to be overcome. A long follow-up period may be required, and researchers are encouraged to allow sufficient follow-up time to demonstrate the persistent effects of an intervention. It is of great importance to transform the results from a clinical trial into clinical situations. An interventionist effect that is measured by highly experienced and engaged interventionists or teams in a trial may require highly specific education and information to be provided in order to be reproduced in the clinic.

A good knowledge of the availability of outcome measures, their psychometric properties and feasibility for the study group, and for the research question, is necessary in clinical research. The International Classification of Functioning, Disability and Health (ICF) provides a good theoretical and conceptual basis, and is frequently used in papers published in JRM, but the ICF does not cover all fields, as, for example, quality of life, life satisfaction and well-being. However, JRM encourages authors to define the aim of studies and the instruments to be used for the outcome using ICF terms. There have been several recent reports and reviews on the measurement of outcome in rehabilitation (4, 5). The use of modern psychometric techniques, such as Rasch methodology, for treating ordinal scales, is recommended. In reporting data from ordinal scales the rank-invariant properties of such data should be taken into account, and medians and quartiles should be used.

Bibliometric measures and current impact factors

To obtain an indication of the importance and popularity of individual papers, the citation rates of papers or downloads can be assessed. The 10 most cited papers published in JRM from 2008 and 2009 are shown in Table I, with the highest citation rates being 25, and none below 13. This demonstrates that the mean citation rate, which is the basis for determining impact factors, is usually dependent on a few very highly-cited papers. The distribution of the type of papers shows 2 Reviews, and 2 Special Reports (indicating a relative preference for citations from these types of papers), 3 Original Reports with RCT and 3 other Original Reports. Four of the 10 most cited papers were in the neurological area, 4 in the musculoskeletal and pain areas, and 2 in other areas. With a perspective from the most cited papers starting in 2007, it is interesting to note that the 4 most-cited papers, with citations of the order of approximately 30–60, were some of the articles in the Special Report on the ICF: "A unifying model for the conceptualization, organization and development of human functioning and rehabilitation research" (2007; 39, No. 4). This demonstrates the interest in papers on research conceptualization.

There is ongoing discussion about bibliometric measures to indicate the importance and popularity of journals. Some aspects of this topic have been published recently in JRM (6) and commented on in an Editorial in the same issue (vol. 43, no. 6), indicating that "the concept of scientific impact is multidimensional and cannot be captured adequately by a single indicator". Thus, it would be of value to use several indicators giving somewhat different information. The traditional 2-year

Table I. *Ten most cited articles in JRM published during 2008 and 2009*

Number	Article	Citations, *n*	Type of article
1	Wissel J, Ward AB, Erztgaard P, Bensmail D, Hecht MJ, Lejeune TM, et al. European consensus table on the use of botulinum toxin type A in adult spasticity. J Rehabil Med 2009; 41: 13–25.	25	SR
2	Takeuchi N, Tada T, Toshima M, Chuma T, Matsuo Y, Ikoma K. Inhibition of the unaffected motor cortex by 1 Hz repetitive transcranial magnetic stimulation enhances motor performance and training effect of the paretic hand in patients with chronic stroke. J Rehabil Med 2008; 40: 298–303.	19	OR RCT
3	Nijs J, Paul L, Wallman K. Chronic fatigue syndrome: an approach combining self-management with graded exercise to avoid exacerbations. J Rehabil Med 2008; 40: 241–247.	18	SR
4	Tomas-Carus P, Gusi N, Häkkinen A, Häkkinen K, Leal A, Ortega-Alonso A. Eight months of physical training in warm water improves physical and mental health in women with fibromyalgia: a randomized controlled trial. J Rehabil Med 2008; 40: 248–252.	17	OR RCT
5	Norlund A, Ropponen A, Alexanderson K. Multidisciplinary interventions: review of studies of return to work after rehabilitation for low back pain. J Rehabil Med 2009; 41: 115–121.	15	Rev
6	Flansbjer UB, Miller M, Downham D, Lexell J. Progressive resistance training after stroke: effects on muscle strength, muscle tone, gait performance and perceived participation. J Rehabil Med 2008; 40: 42–48.	15	OR RCT
7	Buffart LM, Roebroeck ME, Rol M, Stam HJ, van den Berg-Emons RJ; Transition Research Group South-West Netherlands. Triad of physical activity, aerobic fitness and obesity in adolescents and young adults with myelomeningocele. J Rehabil Med 2008; 40: 70–75.	15	OR
8	Lynch EB, Butt Z, Heinernann A, Victorson D, Nowinski CJ, Perez L, et al. A qualitative study of quality of life after stroke: the importance of social relationships. J Rehabil Med 2008; 40: 518–523.	14	OR
9	Jelsma J. Use of the International Classification of Functioning, Disability and Health: a literature survey. J Rehabil Med 2009; 41: 1–12.	13	Rev
10	Gruther W, Benesch T, Zorn C, Paternostro-Sluga T, Quittan M, Fialka-Moser V, et al. Muscle wasting in intensive care patients: ultrasound observation of the M. quadriceps femoris muscle layer. J Rehabil Med 2008; 40: 185–189.	13	OR

SR: Special Report; OR RCT: Original Report Randomized Controlled Trial; Rev: Review; OR: Original Report (not RCT).

journal impact factor (JIF) covers only a short period, which is not favourable, for example, for clinical journals for which the peak citation time is later than 2 years; whereas the more recently introduced 5-year JIF covers a longer period, as do the Eigenfactor Score (EFS) and the Article Influence Score (AIS). Both of the EFS and the AIS weigh their results with respect to the citation rate of each journal in which the references appear and correct across disciplines, which appears to be a sound approach when evaluating the importance and quality of a journal. The AIS is independent of the size of the journal, but EFS is not, and this may be of importance in evaluating the quality, if not the absolute impact, of a journal. Another indicator, which is also mentioned in the paper by Franchignoni & Munos Lasa (6), is the SCImago Journal rank Indicator (SJI), which also weighs the citations and uses a larger database, but does not cover more than the previous 3 years. Citation half-time is an indicator that provides specific information on the mean time for which a paper in that journal would be cited.

The indicators for JRM for 2009 and 2010 are presented in Table II, and these show relatively steady figures for the different indicators over these 2 years. The 2-year impact factor has remained slightly below or above 2 for the last 5 years, with a slight increase between 2009 and 2010. The EFS and AIS, which are emphasized by Franchignoni & Munos Lasa (6) as being of special interest for evaluating the quality and influence of a journal, have been relatively stable. For the AIS, JRM is ranked second among the key journals (6) in rehabilitation medicine. The somewhat lower number of articles published in 2010 compared with 2009 is due to a larger Special Issue being published in 2009.

Table II. *Bibliometric indicators for the years 2009 and 2010. Journal citation reports by the Institute for Science Information for the Journal of Rehabilitation Medicine. 2Y-JIF and 5Y-JIF are the 2-year and 5-year journal impact factors, respectively*

	2009	2010
Published articles, *n*	162	142
2-year JIF	1.882	1.967
5-year JIF	3.027	2.443
EFS	0.00781	0.00742
AIS	0.849	0.718

EFS: Eigenfactor Score; AIS: Article Influence Score.

Special reports

Two Special Reports on the conceptual description of rehabilitation are published in the present issue. Comments on this important topic are also invited as Letters to the Editor. This discussion on the conceptual framework began in the Special Issue published in JRM no. 4, 2007. The present reports are based on discussions supported by 3 European bodies within Physical and Rehabilitation Medicine, all of which are linked with JRM, and this makes it a special pleasure to be able to publish these papers: the Section and Board of Physical and Rehabilitation Medicine of the Union Européenne des Médecins Spécialistes; the European Society of Physical and Rehabilitation Medicine; and the European Academy of Rehabilitation Medicine.

As the the World Health Organization World Report on Disability (WDR) is of utmost interest for physical and rehabilitation medicine, we will publish a Special report on that in a forthcoming issue. You are thereafter invited to submit Letters to the Editor on this important topic.

In later issues we also intend to publish reports on Rehabilitation Disaster Relief, which is a very pertinent topic for our field due to recent catastrophes in various parts of the world.

New appointments within the group of Editors

Two Co-Editors have been appointed from 1 August 2011. This will enable one of the Co-Editors (Bengt Sjölund) to successively increase his editorial responsibilities over the coming year. The other Co-Editor (Henk Stam) will be an Advisory Co-Editor, being available together with the Editor-in-Chief for activities related to the journal's co-operation with the organizations for which JRM is the official journal, or which JRM is published in association with, as well as being a "discussion partner" for the Editor-in-Chief for complicated cases and for matters related to journal policy. I am looking forward to participating in this cooperation during the last half of 2011 and the first half of 2012.

Finally, I welcome two new Associate Editors, Gerard Francisco from the USA and Jianan Li from China, who will increase the journal's international network and contribute with their special competence to the development of JRM. We are delighted to have been able to recruit them to our team.

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Göteborg and Uppsala, August 2011

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