

Core journals of evidence-based physiotherapy practice

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To identify the core journals of evidence-based physiotherapy practice we conducted an analysis of the Physiotherapy Evidence Database (PEDro), the most comprehensive database of physiotherapy clinical trials and systematic reviews. We compared our results to two earlier lists of core journals based upon citation analyses and rankings from the Institute for Scientific Information (ISI) impact factors. As of 2 June 2000 the PEDro database contained 2,231 papers that had been published in 519 different journals with a single journal contributing from 1 to 109 papers. When journals were ranked based upon the total number of papers contributed to PEDro the top five journals were: *Archives of Physical Medicine and Rehabilitation*, *British Medical Journal*, *Spine*, *Physical Therapy*, and *Cochrane Database of Systematic Reviews*. However when the journals were ranked based upon the average methodological quality of clinical trials the top five were: *British Journal of Obstetrics and Gynaecology*, *New England Journal of Medicine*, *Stroke*, *Scandinavian Journal of Rheumatology*, and *British Journal of Rheumatology*. When judged by trial quality, the top five exclusively physiotherapy journals were *Australian Journal of Physiotherapy*, *Physiotherapy Theory and Practice*, *Physical Therapy*, *Physiotherapy*, and *Physiotherapy Canada*. Each approach to ranking the journals produced a different set and ranking of core journals to that of the two previous citation analyses. The current study's rankings were unrelated to ISI impact factors.

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INTRODUCTION

Evidence-based practice requires ready access to external evidence that can lead to informed clinical decision making. Unfortunately, while physiotherapists have been embracing evidence-based practice, libraries have been under growing funding pressure. Journal subscription costs have increased dramatically over the last decade; in the field of medicine the average price increase over this period was 304% (Albee and Dingley, 2000). Many library budgets have not been able to accommodate such increases and libraries have had to consider options such as cancelling serial subscriptions and switching from paper to electronic formats. In a time of rationing it would seem sensible to be able to identify the core physiotherapy-relevant journals so that, at a minimum, these can be maintained in collections. Similarly an individual may only be able to afford to subscribe to a couple of journals, so it would be helpful if the core physiotherapy-relevant journals were identified.

There are other reasons for identifying the core journals of physiotherapy practice. The publication record of an academic physiotherapist is often used as a measure of their achievements when they apply for research funding, promotion, or a new academic position. In addition to the number of publications, the standing of journals in a publication list is often scrutinised. In many institutions a journal's standing is measured using the Institute for Scientific Information's (ISI) journal impact factor (ISI, 2000). There are, however, potential problems in applying the ISI impact factor to measure the standing of physiotherapy journals. The most obvious is that many physiotherapy journals are not listed by ISI and so do not attract an impact factor. Second, there has been considerable debate on the value of the impact factor with many arguments presented to suggest that the impact factor may be a flawed measure of a journal's standing (e.g., Linde, 1998; Gallagher and Barnaby, 1998). The ISI cautions that the impact factor only provides a gross approximation of the prestige of journals and that there are many artifacts that can influence a journal's impact factor (ISI, 2000).

Our experience from talking with physiotherapy researchers is that most do not rank journals according to ISI impact factors but rather have developed their own hierarchy of the relative standing of journals that publish physiotherapy research. We are unaware of research that has examined this issue. However, our informal discussions with colleagues suggests that factors such as whether the journal is indexed on Medline, is international rather than national, and the physiotherapist's own assessment of the quality of papers in the journal are determinants of a physiotherapist's perception of the standing of a journal.

There have been attempts to objectively determine the standing of physiotherapy journals and develop a core set of journals relevant to physiotherapy practice. Physiotherapists have been surveyed as to what journals they read (e.g., Turner and Whitfield, 1997), experts have been asked to nominate core journals (e.g., Sewerniak, 1997), and citation analyses have been undertaken (e.g., Bohannon, 1999; Wakiji, 1997).

Bohannon's (1999) list of core physiotherapy-relevant journals was generated by citation analysis. The articles analysed were those published in a year's span of seven exclusively-physiotherapy journals (*Physical Therapy*, *Physiotherapy*, *Physiotherapy Canada*, *Australian Journal of Physiotherapy*, *Physiotherapy Theory and Practice*, *Physiotherapy Research International*, and *Journal of Physical Therapy Science*). The reference lists of the articles were inspected and the number of times a journal was cited in the reference list of these articles was tallied. Bohannon defined a core journal as one that was cited greater than 20 times. With this criterion 47 core physiotherapy-relevant journals were identified, the top five being: *Physical Therapy*, *Physiotherapy*, *Archives of Physical Medicine and Rehabilitation*, *Spine*, and *New England Journal of Medicine*.

Wakiji's earlier citation analysis (Wakiji, 1997) took a more parochial approach to mapping the physical therapy literature by only analysing the cited references in the 1991–1993 issues of two American journals: *Physical Therapy* and *Archives of Physical Medicine*

and Rehabilitation. Not surprisingly the top two cited journals were the two source journals: *Archives of Physical Medicine and Rehabilitation* and *Physical Therapy*.

There are a number of reasons why Bohannon (1999) and Wakiji's (1997) approaches may not have identified the core physiotherapy-relevant journals. Articles were sampled from a limited time-span and range of journals. All the journals were English language journals, making it unlikely that any non-English language journals would be cited and so able to be identified as a core journal. Lastly, the citation analysis provides no scope for consideration of the quality of the publications.

An alternate approach would be to rank journals based upon the amount and quality of high level external evidence, that is, randomised controlled trials (RCTs) and systematic reviews of RCTs, published in the journal. This would look at how well the journals guide decisions about the effects of physiotherapy treatment. Such an approach has been made possible by the development of the Physiotherapy Evidence Database (PEDro) which indexes RCTs and systematic reviews relevant to physiotherapy. The aim of this paper is to identify and rank a core set of journals that publish research evaluating physiotherapy treatments. Journals would be ranked according to the number of systematic reviews and the number and quality of RCTs of physiotherapy treatment they published. To avoid the information bias of the two earlier citation analyses there would be no time-span or language restrictions.

METHODS

The RCTs and systematic reviews were sourced from PEDro. PEDro is a free web-based database of systematic reviews and quality assessed RCTs of physiotherapy treatments. Prior to being added to the database all entries are confirmed as either an RCT or a systematic review of RCTs. As PEDro is probably the most complete database of RCTs and systematic reviews in physiotherapy, this provides some insights into the scope of evidence that can be used to guide decisions about therapeutic interventions in

physiotherapy, plus the added advantage of quality ratings. On 2 June 2000, all records on the PEDro database were exported for subsequent analysis in Excel. For each entry the following fields were retrieved: author, year of publication, title of paper, journal, total PEDro score, and type of publication (systematic review or RCT).

Two methods were used to rank the journals. The first was a frequency count of the number of entries for each journal. This analysis was conducted for RCTs and systematic reviews. The second method of ranking the journals was based on the methodological quality of the RCTs published in the journal.

Methodological quality of RCTs was measured with the PEDro quality rating, a scale based on the Delphi list described by Verhagen et al (1998). Three PEDro scale items have been validated empirically in the medical literature: randomisation (Colditz, Miller, and Mosteller, 1989; Miller, Colditz, and Mosteller, 1989; Sacks, Chalmers, and Smith, 1982; Chalmers, Celano, Sacks, and Smith, 1983), concealed allocation (Chalmers et al, 1983; Schulz, Chalmers, Hayes, and Altman 1995; Moher et al, 1998), and blinding (Colditz et al, 1989; Schulz et al, 1995). The other items (e.g., intention-to-treat analysis, between groups statistical analysis) have face validity but are yet to be empirically validated. The PEDro scale has been shown to have acceptable inter-rater reliability (Moseley, Maher, Herbert, and Sherrington, 1999).

PEDro ratings are provided by raters who have undertaken a training program and passed a rating accuracy test. The aim is to have all trials independently rated by two raters. Cases of disagreement in ratings are arbitrated by a member of the steering committee of the Centre for Evidence-Based Physiotherapy (CEBP).

Descriptive statistics for the quality scores of the RCTs published in each journal were then calculated, and journals were ranked based on the mean methodological quality of clinical trials. This analysis was restricted to journals that had at least five RCTs listed on the PEDro database. The decision to restrict the analysis

to journals that had at least five RCTs was made because the earlier analysis revealed that over half the journals on the database contributed only a single paper. The authors did not believe that it would be sensible to label a journal as a "core" journal in such a situation.

Due to the fact that some items on the PEDro scale (such as intention-to-treat analysis or concealed allocation) are typically not reported in earlier trials, newer journals may have a higher average quality score than journals that have been publishing for many years. To account for this the quality analysis was repeated based upon the subset of RCTs published since 1990.

To investigate the relationship between journal rankings made based upon the number of entries in PEDro, those based upon PEDro quality scores, and the rankings provided by Bohannon, Spearman's rho correlations were calculated. The journals also were ranked according to ISI impact factors for 1998 (the latest available as of July 2000) and these rankings were correlated with the two PEDro rankings.

RESULTS

As of 2 June 2000, the PEDro database contained 2,231 records: 1,764 RCTs, 240 systematic reviews, and 227 uncoded papers. Of the 1,764 RCTs, all had been rated for methodological quality by at least one rater and 732 had consensus ratings. The 2,231 papers had been published in 519 different journals, with a single journal contributing from 1 to 109 papers. The majority of journals (282 of 519) contributed a single paper.

The top 49 journals based upon the citation analysis of PEDro are shown in Table 1. The table shows the total number of entries for a journal, the ranking based upon the number of entries in PEDro, the Bohannon (1999) and Wakiji (1997) rankings and the ISI ranking for the common journals. This analysis produced a different set and ranking of core journals from both previous citation analyses and the rankings based upon ISI impact factors. The correlation between the PEDro rankings and

the Wakiji rankings was 0.43 ($p = 0.02$) and between the PEDro ranking and Bohannon ranking 0.48 ($p = 0.008$). The rankings based upon the number of PEDro entries were not related to rankings based upon ISI impact factors (Spearman's rho = 0.23, $p = 0.15$).

The ranking of journals based upon methodological quality is shown in Table 2. In contrast to the rankings based upon PEDro count, the rankings based upon methodological quality were negatively correlated to Bohannon's (1999) rankings, which were made independent of consideration of study quality (Spearman's rho = -0.52, $p = 0.006$). The rankings based upon methodological quality were not correlated with the rankings based upon ISI impact factors (Spearman's rho = 0.22, $p = 0.17$) or Wakiji (1997) rankings (Spearman's rho = 0.16, $p = 0.40$). Table 3 shows the ranking of journals based upon the methodological quality of trials published after 1990. The set of journals and rankings is similar to Table 2.

DISCUSSION

The present ranking of journals based upon either the number of entries in PEDro or the methodological quality of the trials produced a different ranking of the core physiotherapy-relevant journals than that provided by two previous citation analyses (Bohannon, 1999; Wakiji, 1997). This difference in rankings was most obvious when the journals were ranked based upon the methodological quality of the trials they published. It is our opinion that rankings of physiotherapy journals based solely upon citation count are not helpful for physiotherapists who wish to adopt evidence-based practice. For these practitioners, the methodological quality of RCTs is likely to be a key concern.

The consideration of trial quality can have a marked effect on rankings of journals. While *Archives of Physical Medicine and Rehabilitation* was ranked #1 based upon total number of entries (109) in PEDro, its ranking dropped to #14.5 when ranked according to the methodological quality of clinical trials. Similarly the

Table 1
Journals ranked by number of records in PEDro

Journal title	Total Entries	PEDro Count Ranking	Bohannon Ranking	Wakiji Ranking	ISI Ranking
Archives of Physical Medicine and Rehabilitation	109	1	3	1	30
British Medical Journal (continued by BMJ)	82	2.5	12	27	6
Spine	82	2.5	4	4	21
Physical Therapy	73	4	1	2	27
Cochrane Library Cochrane Database of Systematic Reviews (Completed)	67	5	N/A	N/A	N/A
Pain	51	6	11	16	9
Physiotherapy	49	7.5	2	34	N/A
Scandinavian Journal of Rehabilitation Medicine	49	7.5	22	11	33
Lancet	40	9	40.5	18	2
Clinical Rehabilitation	32	10.5	34	N/A	N/A
Journal of Orthopaedic and Sports Physical Therapy	32	10.5	9	24	34
American Journal of Sports Medicine	31	12	13	28	24
Chest	28	13	29.5	58	14
Journal of Rheumatology	27	14	34	N/A	16
Journal of the American Medical Association	26	15.5	19	8	4
Stroke	26	15.5	27.5	25	8
Journal of Manipulative & Physiological Therapeutics	25	17	N/A	N/A	N/A
Journal of the American Geriatrics Society	24	18	14	33	11
American Journal of Occupational Therapy	23	19.5	26	35	N/A
Physiotherapy Canada	23	19.5	7	38	N/A
New England Journal of Medicine	22	21	5	12	1
Ugeskrift for Laeger	20	22.5	N/A	N/A	N/A
Journal of Bone & Joint Surgery– British Volume	20	22.5	6	29	22
Physiotherapy Theory & Practice	19	24.5	15	N/A	N/A
Developmental Medicine & Child Neurology	19	24.5	38	22	25
American Review of Respiratory Disease (continued by American Journal of Respiratory and Critical Care Medicine)	17	26.5	N/A	N/A	7
British Journal of Rheumatology	17	26.5	N/A	N/A	12
American Journal of Physical Medicine & Rehabilitation	17	26.5	25	13	35
Scandinavian Journal of Rheumatology	16	29.5	N/A	N/A	29
Clinical Orthopaedics & Related Research	16	29.5	10	5	31
Australian Journal of Physiotherapy	15	31.5	8	85	N/A
Medicine & Science in Sports & Exercise	15	31.5	20	17	19
Arthritis & Rheumatism	14	33.5	31.5	74	5
Thorax	14	33.5	N/A	N/A	10
Annals of the Rheumatic Diseases	14	33.5	40.5	N/A	18
British Journal of Obstetrics & Gynaecology	13	36.5	N/A	N/A	13
Clinical Journal of Pain	13	36.5	N/A	N/A	20
Journals of Gerontology	13	36.5	17	43	26
Arthritis Care & Research	13	36.5	46	N/A	32
Acta Orthopaedica Scandinavica	13	36.5	N/A	61	36
European Respiratory Journal	12	41.5	N/A	N/A	15
Age & Ageing	12	41.5	N/A	72	23
Injury	11	43	N/A	N/A	39
Zeitschrift fur Physiotherapie	10	44.5	N/A	N/A	N/A
Journal of Bone & Joint Surgery– American Volume	10	44.5	6*	3	17
Journal of Psychosomatic Research	10	44.5	N/A	N/A	28
Annals of Internal Medicine	9	47.5	40.5	32	3
Foot & Ankle International	9	47.5	N/A	N/A	37
Journal of Hand Surgery– British Volume	9	47.5	N/A	N/A	38

Ranking of 519 journals based upon the total number of records in PEDro as of 2 June 2000, list truncated to 49 entries. Tied rankings are signified by the suffix .5, the protocol used in Bohannon's paper. For comparison, the rankings from Bohannon's and Wakiji's earlier citation analyses are shown. ISI rankings are based upon 1998 impact factors. Shaded entry is the highest-ranked exclusively physiotherapy journal. The N/A coding signifies that the journal was not included.

Bohannon collapsed both JBJS series.

Table 2
Journals ranked by trial quality

Journal	Mean	SD	Count	PEDro Quality Ranking	Bohannon Ranking	Wakiji Ranking	ISI Ranking
British Journal of Obstetrics & Gynaecology	6.33	1.67	12	1	N/A	N/A	17
New England Journal of Medicine	6.05	1.40	22	2	5	12	1
Stroke	5.83	1.27	24	3.5	27.5	25	10
Scandinavian Journal of Rheumatology	5.83	1.47	12	3.5	N/A	N/A	33
British Journal of Rheumatology	5.69	1.58	16	5	N/A	N/A	16
Journal of Chronic Diseases (continued by Journal of Clinical Epidemiology)	5.60	1.34	5	6	27.5	57	27
Journal of Rheumatology	5.47	1.43	19	7.5	34	N/A	21
Developmental Medicine & Child Neurology	5.47	1.36	15	7.5	38	22	31
Annals of Internal Medicine	5.43	0.98	7	9	40.5	32	3
Lancet	5.42	1.61	36	10	40.5	18	2
Neurology	5.40	1.14	5	11	24	9	9
Clinical Rehabilitation	5.31	1.53	32	12.5	34	N/A	N/A
Arthritis Care & Research	5.31	1.18	13	12.5	46	N/A	35
Journal of the American Medical Association	5.29	1.12	24	14	19	8	4
Spine	5.24	1.70	67	15	4	4	28
Unfallchirurg	5.20	1.79	5	16	N/A	N/A	38
Journal of Occupational Rehabilitation	5.17	1.60	6	17	N/A	N/A	N/A
Arthritis & Rheumatism	5.15	0.80	13	18	31.5	74	6
Journal of Manipulative & Physiological Therapeutics	5.05	1.36	20	19	N/A	N/A	N/A
British Medical Journal (continued by BMJ)	5.04	1.94	71	20	12	27	24
Circulation	5.00	1.00	5	21.5	N/A	63	5
Archives of Internal Medicine	5.00	0.71	5	21.5	N/A	N/A	7
Acupuncture & Electro-Therapeutics Research	5.00	1.79	6	21.5	N/A	N/A	39
Scandinavian Journal of Rehabilitation Medicine	4.94	1.79	48	24	22	11	37
European Respiratory Journal	4.92	1.24	12	25.5	N/A	N/A	20
Clinical Journal of Pain	4.92	1.26	13	25.5	N/A	N/A	26
Age & Ageing	4.92	1.24	12	25.5	N/A	72	30
Journal of Bone & Joint Surgery- British Volume	4.89	1.56	19	28	6	29	29
American Review of Respiratory Disease (continued by American Journal of Respiratory and Critical Care Medicine)	4.87	1.41	15	29	N/A	62	25
Thorax	4.83	0.72	12	30.5	N/A	N/A	14
Acta Obstetricia et Gynecologica Scandinavica	4.83	1.33	6	30.5	N/A	N/A	36
Pain	4.81	2.04	43	32	11	16	12
Journal of Pediatrics	4.80	1.30	5	33.5	N/A	60	13
Annales Chirurgiae et Gynaecologiae	4.80	0.84	5	33.5	N/A	N/A	40
Journal of the American Geriatrics Society	4.77	1.60	22	35	14	33	15
British Journal of Surgery	4.71	0.76	7	36	N/A	N/A	8
Australian Journal of Physiotherapy	4.64	1.78	14	37	8	85	N/A
Journal of Consulting & Clinical Psychology	4.60	1.14	5	38	N/A	48	N/A
Physiotherapy Practice (continued by Physiotherapy Theory and Practice)	4.56	0.86	18	39.5	15	N/A	N/A
Chest	4.56	1.19	27	39.5	29.5	58	19
Annals of the Rheumatic Diseases	4.50	2.03	14	41	40.5	87	23
Physical Therapy	4.45	1.58	62	42	1	2	32
Physiotherapy	4.43	1.89	47	43	2	34	N/A
Physiotherapy Canada	4.42	1.35	19	44.5	7	38	N/A
Archives of Physical Medicine & Rehabilitation	4.42	1.74	100	44.5	3	1	34
Zeitschrift für Physikalische Medizin, Balneologie und Medizinische Klimatologie	4.40	1.95	5	46.5	N/A	N/A	N/A
American Journal of Medicine	4.40	0.55	5	46.5	N/A	73	11
British Journal of General Practice	4.40	1.14	5	46.5	N/A	N/A	18
Journal of Bone & Joint Surgery- American Volume	4.40	1.35	10	46.5	6	3	22
International Orthopaedics	4.40	2.07	5	46.5	N/A	N/A	41

Ranking of journals based upon methodological quality of the RCTs contained in PEDro database as of 2 June 2000. Analysis restricted to the 75 journals with at least 5 RCTs on the PEDro database, list truncated to 50 entries. Table shows mean and standard deviation PEDro scores plus the number of RCTs this summary was based upon. For comparison the rankings from Bohannon's and Wakiji's earlier citation analyses are shown. Tied rankings are signed by the suf x .5, the protocol used in Bohannon's paper. ISI rankings are based upon 1998 impact factors. Shaded entry is the highest ranked exclusively physiotherapy journal.

Table 3
Journals ranked by quality of post 1990 trials

Journal	Mean	SD	Count	Post 1990 Quality Ranking	Bohannon Ranking	Wakiji Ranking
British Journal of Obstetrics & Gynaecology	6.80	0.84	5	1	N/A	N/A
New England Journal of Medicine	6.54	1.39	13	2	5	12
British Journal of Rheumatology	6.33	1.66	9	3	N/A	
Developmental Medicine & Child Neurology	6.25	0.89	8	4.5	38	22
Lancet	6.25	1.39	16	4.5	40.5	18
Scandinavian Journal of Rheumatology	6.13	1.36	8	7	22	N/A
British Medical Journal	6.06	1.74	32	8	12	27
Stroke	5.95	1.28	21	9	27.5	25
Scandinavian Journal of Rehabilitation Medicine	5.68	1.81	22	10	22	11
Arthritis & Rheumatism	5.50	0.84	6	11	31.5	74
Journal of Rheumatology	5.47	1.42	17	12	34	N/A
Clinical Rehabilitation	5.46	1.56	24	13	34	N/A
Neurology	5.40	1.14	5	14	24	9
Spine	5.35	1.73	51	15	4	4
Arthritis Care & Research	5.33	1.23	12	16	46	N/A
Pain	5.32	2.16	19	17	11	16
Journal of the American Medical Association	5.26	1.24	19	18	19	8
Journal of Manipulative & Physiological Therapeutics	5.25	1.39	16	19	N/A	N/A
Journal of Bone & Joint Surgery-British Volume	5.18	1.33	11	20	6	29
Annals of the Rheumatic Diseases	5.17	2.64	6	6	40.5	87
Journal of Occupational Rehabilitation	5.17	1.60	6	21	N/A	N/A
Age & Ageing	5.13	1.25	8	22	N/A	72
European Respiratory Journal	5.09	1.14	11	23	N/A	N/A
Australian Journal of Physiotherapy	5.00	1.94	10	24.5	8	85
Physiotherapy Canada	5.00	1.41	6	24.5	7	38
Archives of Physical Medicine & Rehabilitation	4.93	1.60	57	26	3	1
Physical Therapy	4.78	1.65	27	27	1	2
Thorax	4.67	0.82	6	29	N/A	N/A
Physiotherapy Theory & Practice	4.64	0.92	11	30	15	N/A
Journals of Gerontology	4.60	1.35	10	31	17	43
Physiotherapy	4.57	1.79	30	28	2	34
Journal of the American Geriatrics Society	4.53	1.70	17	32.5	14	33
Journal of Orthopaedic & Sports Physical Therapy	4.53	1.07	19	32.5	9	24
Injury	4.43	1.81	7	35	N/A	N/A
Chest	4.40	1.18	15	36.5	29.5	58
Medicine & Science in Sports & Exercise	4.40	1.14	5	36.5	20	17
American Review of Respiratory Disease (continued by American Journal of Respiratory and Critical Care Medicine)	4.38	0.92	8	NA	N/A	62
	4.29	1.25	7	38	25	13
Physikalische Medizin Rehabilitationsmedizin Kurortmedizin	4.20	3.11	5	39	N/A	N/A
American Journal of Sports Medicine	4.19	1.60	16	40	13	28
American Journal of Occupational Therapy	4.09	1.14	11	41	26	35
Behaviour Research & Therapy	4.00	0.71	5	42.5	N/A	N/A
Respiratory Medicine	4.00	0.63	6	42.5	N/A	N/A
Foot & Ankle International	3.50	1.05	6	44	N/A	N/A
Clinical Orthopaedics & Related Research	3.44	0.53	9	45	10	5
Journal of Sport Rehabilitation	3.40	1.34	5	46	N/A	N/A

Ranking of journals based upon methodological quality of the recent RCTs contained in PEDro database as of 2 June 2000. Analysis restricted to the 46 journals with at least 5 RCTs published after 1990 on the PEDro database. Table shows mean and standard deviation PEDro scores plus the number of RCTs this summary was based upon. For comparison the rankings of Bohannon's and Wakiji's earlier citation analyses are shown. Tied rankings are signified by the suffix .5, the protocol used in Bohannon's paper. Shaded entries are the highest-ranked physiotherapy journals.

highest-ranked physiotherapy journal (*Physical Therapy*) fell from #4 to #42 when quality was considered.

When trial quality is considered, the five highest-ranked exclusively physiotherapy journals cluster in a narrow range. Table 2 shows that these journals (*Australian Journal of Physiotherapy*, *Physiotherapy Theory and Practice*, *Physical Therapy*, *Physiotherapy*, and *Physiotherapy Canada*) had scores ranging from 4.64 to 4.42. This result supports the conclusion that the only substantive difference between these physiotherapy journals is in the number of RCTs and systematic reviews each has published. This difference seems to be largely explained by the number of issues each journal produces in a year. For example, *Physiotherapy Canada* and *Australian Journal of Physiotherapy* each publish only four issues per year whereas *Physical Therapy* and *Physiotherapy* each publish twelve.

Our analysis identified six non-English language journals (*Zeitschrift für Physiotherapie*, *Ugeskrift for Laeger*, *Unfallchirurg*, *Annales Chirurgia et Gynaecologiae*, *Zeitschrift für Physikalische Medizin, Balneologie und Medizinische Klimatologie*, and *Physikalische Medizin Rehabilitationsmedizin Kurortmedizin*) that could be considered core physiotherapy-relevant journals. It is likely that the impact of non-English journals has been underestimated in our analysis. For example, as of 24 July 2000 there were 2,436 entries (2,170 RCTs, 266 systematic reviews) on PEDro of which only 181 (175 RCTs, 6 systematic reviews) were non-English language articles. Accessing the non-English language physiotherapy literature is difficult because the majority of PEDro staff and volunteers who locate and rate papers are only fluent in English. Only 8 of the 73 PEDro raters are able to speak an additional language to English (French [3 raters], German [2 raters], and Romanian, Hungarian, Finnish, Italian, Hebrew, Russian, Norwegian, Tamil, and Hindi [1 rater each]). To date most of the non-English trials on PEDro have been supplied via the Cochrane Rehabilitation & Related Therapies Field database.

An interesting result of this study was the inclusion of the *Journal of Manipulative and Physiological Therapeutics* (*JMPT*) as a core journal

based upon both total citations (ranking #17) and RCT quality (ranking #9). *JMPT* is a chiropractic journal and so may be easily overlooked for inclusion in a physiotherapy library. Our objective analysis suggests that this would be a mistake as *JMPT* provided more entries than physiotherapy journals such as *Physiotherapy Canada*, and typically published RCTs of slightly better quality than the physiotherapy journals.

The absence of a correlation between the rankings based upon PEDro quality scores and rankings based upon ISI impact factors suggests that ISI impact factors may not be helpful in judging the quality of physiotherapy research. As an illustration the top two journals based upon the quality of RCTs had comparable mean quality scores, 6.33 and 6.05, but their respective impact factors were markedly different: 2.299 and 28.66.

The Institute for Scientific Information's 1998 impact factors provide an incomplete coverage of physiotherapy-relevant literature. Only one of the top five (by RCT quality) exclusively physiotherapy journals has an impact factor, however each of these five journals publish RCTs of greater quality than journals that received an impact factor. Also since the five exclusively physiotherapy journals publish RCTs of similar quality, there appears to be no objective basis to include *Physical Therapy* but not the other journals. Similarly there is an incomplete coverage of the top physiotherapy-relevant journals with only 41 of the top 50 (as judged by RCT quality) receiving an impact factor. The most obvious omission is the journal *Clinical Rehabilitation* which had a mean quality score of 5.31, comparable to the *Journal of the American Medical Association* at 5.29 which received an impact factor of 9.522. The last problem with ISI's impact factors is that they appear to ignore non-English journals. None of the non-English language journals identified as core physiotherapy-relevant journals had an impact factor.

Thirteen of the physiotherapy journals listed in Tables 1 and 2 did not have an impact factor at the time of the audit. To estimate how many of these would soon be eligible for one, ISI's Web of Science was inspected

on 28 July 2000. Seven of the 14 journals that did not have an impact factor in 1998 were listed, meaning that, in time, they will generate an impact factor. However because impact factors measure citations in the previous two years, this will take another two years. Additionally three (*Physiotherapy*, *Physiotherapy Theory and Practice*, and *Physiotherapy Canada*) of the top five exclusively physiotherapy journals are still not listed by ISI. Because of incomplete coverage of physiotherapy-relevant journals, and the absence of a relationship between rankings based upon methodological quality and impact factors we warn physiotherapists to not accept the impact factor as a measure of the prestige of journals in which they may publish their research.

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