SCHOLARLY JOURNALS

Influential Kinesiology Journals: The View From Outside the Field

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Abstract

The purpose of this study was to document the top journals classified in the area of kinesiology in three bibliometric databases and the associations between the main bibliometric indicators reported through them. The Thomson Reuters Journal Citation Reports was searched for journals indexed (n = 85) in the sport sciences *category for 2011. SCImago Journal and Country Rank was searched for journals indexed in the* physical therapy, sport therapy, and rehabilitation *(n = 70) and the* orthopedics and sports medicine *(n=146) subject categories for 2011. Google Scholar Metrics was searched for the top 20 journals in the* physical education and sports medicine *subcategory. SCImago journal rank, percentage of uncited papers, impact factor, and Hirsch index (h-index) were analyzed for the top 40 kinesiology journals. The mean bibliometric variables for the top quartile kinesiology journals were qualitatively similar to related academic disciplines. Moderate associations between journal rank, impact factor, and h-index in the databases were observed; however, only weak inverse associations were found between percentage of uncited papers and journal rank and impact factor. External bibliometric indicators showed relatively consistent ratings of influence of top kinesiology journals, but the core kinesiology journals and their influence within the field still need to be defined.*

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Kinesiology is the metadiscipline that is focused on the study of human movement or physical activity. Scholars interested in human physical activity have many journals in which to publish their research, within and outside the discipline of kinesiology. Within kinesiology, scholars have several multidisciplinary journals (e.g., *Medicine & Science in Sports & Exercise*, *Journal of Sports Sciences*, *The Physical Educator*, *Research Quarterly for Exercise in Sport*) in which to publish their research. They also have numerous subdisciplinary (e.g., biomechanics, exercise physiology, measurement, motor behavior, psychology) journals in which they may publish their kinesiology research.

Some faculty believe the influence of kinesiology journals is generally agreed upon, but limited bibliometric research has been done on kinesiology or its subdisciplinary journals. Miranda and Mongeau (1991) reported a survey of faculty perceptions of core physical education and sports journals. Researchers studying the subdiscipline of biomechanics have reported patterns of authorship and sampling (Knudson, 2011, 2012) and the perception of influential journals and articles (Knudson, 2007; Knudson & Chow, 2008; Knudson & Ostarello, 2008, 2010). Fifteen-year trends in social science research in sports (Gao, 2013) and 7-year trends in the impact factor of sports sciences journals have been reported (Tsigilis, Grouios, Tsorbatzoudis, & Koidou, 2010).

Given the lack of research on influential journals by kinesiology faculty beyond the subdiscipline of biomechanics, it is important for kinesiology faculty to know the external status of kinesiology journals based on bibliometric variables and databases commonly examined by the scientific community. The following databases are dominant in the bibliometric and journal influence field (Delgado-Lopez-Cozar & Cabezas-Clavio, 2013): the Thomson Reuters Journal Citation Reports, the SCImago Journal and Country Rank using Elsevier's Scopus, and Google Scholar databases. Many bibliometric variables from these databases have been used to evaluate the importance or influence of scientific journals. Several researchers have reported on the use and misuse of bibliometric variables as surrogate measures for evaluating the quality of journals, individual research studies, lines of research, departments, and whole institutions (Cameron, 2005; Frank, 2003; Garfield, 2006; Kurmis, 2003; Seglen, 1997). Therefore, faculty need to know the perceived influence of kinesiology journals in which they intend to publish their research.

The purpose of this study was to document the importance or influence of kinesiology journals in three bibliometric databases and the associations among four bibliometric variables reported in them. These descriptive data are important to kinesiology faculty seeking high-influence publication outlets and to understand the general perception of kinesiology journals in the academic community.

Methods

Journals related to kinesiology were accessed through the most relevant subject/disciplinary areas, headings, or categories in the three most common bibliometric databases. The Thomson Reuters Journal Citation Reports was searched for journals indexed (n = 85) in the *sport sciences* category for 2011. SCImago Journal and Country Rank was searched for journals indexed in the *physical therapy, sport therapy, and rehabilitation* (n = 70) and the *orthopedics and sports medicine* (n = 146) subject categories for 2011. Ten journals overlapped in these two categories, so 206 journals were related to kinesiology in the SCImago databases. Google Scholar Metrics was searched for English language journals in the *physical education and sports medicine* subcategory. Only the top 20 journals in each category are reported in Google Scholar Metrics, and the data used in the study were accessed May 7, 2013. Other subject areas and subdisciplinary categories were accessed in all databases to provide qualitative comparisons for kinesiology journal bibliometric data.

A primary bibliometric variable based on citation analysis was extracted from each database: the Journal Citation Reports 2-year impact factor (IF2), 3-year SCImago Journal Rank (SJR3), and the Google Scholar Metrics 5-year Hirsch index (h5). The IF2 is the average number of citations of the articles published in a journal in the subsequent 2 years. The SJR3 uses the PageRank algorithm to weigh the impact of citing journals in establishing an average impact for articles published in a journal. The Hirsch index (h5) is the number of articles published in the journal (N) that have at least N citations in the next 5 years. It has been shown through factor analyses that journal influence is associated with the prestige and impact constructs (Bollen, Van de Sompel, Hagberg, & Chute, 2009; Leydesdorff, 2009). In this study, IF2 and SJR3 indicate impact and h5 indicate the prestige factor.

An additional measure, the mean percentage of journal articles that were uncited from 2001 to 2011 (% uncited) in SCImago indexed journals (n = 19,708) was extracted to examine the representative nature of the three citation metrics on articles published in

kinesiology journals. Uncitedness is the percentage of papers that are not cited over a specified time, and most papers are infrequently cited, and thus, evidence of contribution to the literature is limited (Stern, 1990). The association of journal influence and uncitedness in published papers has been of recent interest (Egghe, 2013; Hsu & Huang, 2012). In 2011, 10,677 journals were indexed in the the Journal Citation Reports, and an estimated 40,000 publications were indexed in Google Scholar (Delgado-Lopez-Cozar & Cabezas-Clavio, 2013).

Bibliometric data were organized by the two kinesiology-related subject categories in SCImago (n = 206). The kinesiology journals list was reduced to 172, after 29 primarily medical/surgical journals were removed (e.g., *Journal of Bone and Joint Surgery*, *Arthroscopy*, *Seminars in Arthritis and Rheumatism*). Data for the top 40 journals (top 23%) were extracted from Journal Citation Reports and Google Scholar Metrics. Descriptive data were calculated, and correlations were calculated with 95% confidence intervals (Hopkins, 2007) to examine the associations among the bibliometric variables.

Results

Descriptive data for the top 40 kinesiology journals are shown in Table 1. These kinesiology journals had a mean (*SD*) SJR3 of 0.96 (0.41). Mean IF5 for top kinesiology journals was 2.16 (1.04). Seventeen of the top 20 journals in Google Scholar Metrics in *physical education and sports medicine* were also in the SCImago top 40, and these journals had a mean h5 index of 44.3 (10.2). Significant and moderate to large positive ($0.67 < r < 0.85$) associations were found among the three bibliometric variables (Table 2).

The mean percentage of uncited articles in top kinesiology journals in the previous 10 years varied from 12.8% to 80.7%. Significant but moderate ($r = -0.56$ to -0.50) inverse associations were found between the mean percentages of uncited papers with SJR3 and IF2. No significant association was found between % uncited and the h5 index from Google Scholar Metrics.

Table 1
Bibliometrics of Kinesiology Journals in Three Major Databases

	SCImago		Journal Citation Reports	Google Scholar
Journal	**SJR3**	**% Uncited**	**IF2**	**h5**
Sports Med	2.15	12.8	5.2	51
Am J Sports Med	2.11	23.9	3.8	68
Int J Beh Nut Phy Act	2.00	22.0	3.8	42
Med Sci Sports Exerc	1.75	21.1	4.4	63
Phys Therapy	1.28	43.6	3.1	48
Br J Sports Med	1.22	43.4	4.1	54
J Orth Sport Phys Th	1.20	43.6	3.0	35
Socio Sport J	1.15	46.7	0.9	–
Knee Sur Sp Tra Arth	1.22	38.1	2.2	42
Gait & Posture	1.10	22.9	2.1	–
J Biomech	1.09	23.1	2.4	44
J Sport Ex Psych	1.06	29.6	2.7	–
J Sci Med Sport	1.06	44.8	3.0	35
Clin Biomech	0.98	27.6	2.1	38
J Athletic Train	0.98	38.5	1.8	38
J Stren Cond Res	0.95	38.5	1.8	43
J Phys Act Health	0.95	37.2	–	–
Int J Sp Physio Per	0.92	61.3	1.8	–
J Sports Sci	0.91	38.6	1.9	39
J Electromyo Kine	0.89	24.8	2.0	–
Scan J Med Sci Sp	0.87	27.1	–	39
Int J Sports Med	0.85	32.7	2.4	34
J App Sport Psych	0.83	35.9	1.5	–
Psych Sport Exerc	0.81	28.5	1.9	34
Sport Psychologist	0.76	42.6	1.0	–
Clin J Sport Med	0.76	50.2	1.6	–
Clin Sports Med	0.74	47.2	1.6	–
Sport Ed Society	0.70	49.0	0.8	–
J Mot Behav	0.69	33.4	1.6	–
J Teach Phys Ed	0.68	50.7	1.0	–
Ad Phys Act Quart	0.65	46.7	1.5	–
Res Quart Ex Sport	0.64	41.1	1.5	–
Eur J Phys Reh Med	0.59	32.4	1.4	–
J Physiotherapy	0.59	61.5	1.9	–
Phys Therapy Sport	0.58	60.1	1.0	–
Ped Exerc Sci	0.58	48.2	1.7	–
Am J Phys Med Reh	0.57	40.1	–	–
Hum Mov Sci	0.56	32.8	1.8	–

Table 1 (cont.)

Journal	SCImago		Journal Citation Reports	Google Scholar
	SJR3	% Uncited	IF2	h5
Cur Rev Mus Med	0.55	80.7	–	–
Physiotherapy	0.53	57.6	1.6	–
M	**0.96**	**40.5**	**2.2**	**43.9**
SD	**0.41**	**13.3**	**1.0**	**10.0**

Note. Journals are ranked in SCImago Journal Rank (SJR3) and % uncited is the mean percentage of articles in that journal that were uncited in the Elsevier Scopus database over the last 10 years. IF2 is the 2-year impact factor for the journal from the Thompson Reuter Journal Citation Reports for 2011, and h5 is the Hirsch index for the journal over the last 5 years as reported in Google Scholar Metrics on May, 7, 2013. Missing data (–) are due to the journal not being indexed or having incomplete data for calculation of the metric for that database.

Table 2
Correlation Matrix for Associations Between Bibliometric Measures of Kinesiology Journals

Bibliometric variable	% Uncited	IF2	h5
SJR3	−.56 [−.74, −.30]***	0.85 [.72, .92]***	0.73 [.38, .90]***
% Uncited		−0.50 [−.71, −.20]**	−0.11[−.56, .39]
IF2			0.67 [.28, .87]*

Note. SJR3 is the 3-year SCImago Journal Rank, IF2 is the 2-year impact factor from Journal Citation Reports, and h5 is the 5-year Hirsch index from Google Scholar.
*$p < 0.02$. **$p < 0.01$. ***$p < 0.001$.

Discussion

The top 40 journals indexed in the three databases and classified as related to the kinesiology field had bibliometric measures that compared favorably to similar disciplinary areas. SJR3 for the top 40 kinesiology journals ranged from 2.15 to 0.53, and the SJR3 for "health professions" journals ($n = 202$) indexed in SCImago ranged from 2.52 to 0. The IF2 value for 36 of the top 40 journals in SCI-

mago ranged from 5.2 to 0.8. The mean IF2 (2.16 ± 1.04) for the top kinesiology journals was nominally similar to the mean IF2 in the categories of *rehabilitation* (2.02, $n = 142$) and *education, scientific disciplines* (2.39, $n = 80$). In Google Scholar Metrics, only the top 20 journals are reported according to h5, and the h5 index for 17 kinesiology journals over the past 10 years ranged between 68 and 34. For example, *Medicine & Science in Sports & Exercise* has 63 articles that have also been cited in the database at least 63 times over the previous 5 years. The mean h5 index (43.9 ± 10.0) of top-ranked kinesiology journals was nominally lower than the mean h5 for *social sciences* (60) or *health and medical sciences* (174).

The top quartile kinesiology journals appear to be well cited, and the bibliometric measures for each are favorable in the three major databases studied. However, the journals and publications indexed in the three databases, as well as the mix of journals classified as similar to the discipline of kinesiology, are varied. Despite these differences, the shared variance (r^2 between 45% and 72%) by the three bibliometric variables in the present study were similar for the top journals aligned with kinesiology. This was in agreement with researchers who reported strong associations ($r = 0.61$ to 0.93) among these bibliometric variables across the three databases in other disciplines (Delgado-Lopez-Cozar & Cabezas-Clavio, 2013; Elkins, Maher, Herbert, Moseley, & Sherrington, 2010; Sicilia, Sanchez-Alonso, & Garcia-Barriocanal, 2011).

The large variation in the % uncited papers in the top kinesiology journals was consistent with large differences in uncitedness across disciplines (Hamilton, 1991) A moderate (r^2 about 25%) inverse association was found between uncitedness and journal rank. There were fewer uncited papers in the most highly ranked journals by SRJ3 and IF2, and higher rates of uncited papers in lower ranked journals. There were several notable exceptions, and given the mathematical analysis of citations has an influence on the rankings, this association is logical. With the mean percentage of uncited papers over 10 years in top kinesiology journals being about 40%, it is clear that many articles in these journals do not substantially contribute to knowledge in the field. This observation of many papers in scholarly journals not being cited is common and, with other factors, is supportive of the recommendations of not using journal bibliometric variables as proxies for article quality (Brumback, 2012; Garfield, 2006; Seglen, 1997).

Differences in bibliometric measures and ranking across databases could be due to differences in databases in disciplinary clas-

sifications, indexing or coverage of journals, bibliometric controls, bibliometric variables, time windows, data accuracy and correction controls, and search features. For example, citations in the Journal Citation Reports IF2 are weighted equally, and citations in the SJR3 are weighted with the PageRank algorithm, with a larger time window. Databases are also different. For instance, SCImago and Journal Citation Reports are archived every year. However, Google Scholar is continuously updated, and only summary data of the most recent citation analyses are provided.

Lower numbers of papers are published each year in kinesiology journals compared journals in other disciplines, meaning SJR3 and impact factors may be more relevant bibliometric variables than h5. Although Hirsch indexes are highly stable, they are also highly correlated with the overall number of papers published and cited (Costas & Bordons, 2007). This could be the reason that h5 was not significantly correlated with the other two bibliometric variables in the top kinesiology journals.

Since journal influence is a multidimensional phenomenon (Coleman, 2007; West & Rich, 2012), it would be desirable for future researchers to extend these results with scholar ratings of the influence kinesiology journals. Researchers in other fields have used several methods to identify core disciplinary journals (DuBois & Reeb, 2000; Furr, 1995; Goodyear et al., 2009; Sellers, Perry, Mathiesen, & Smith, 2004). Research on professional's perceptions of core kinesiology journals would help kinesiology scholars better define the field to other scholars and journal databases. This would be important information to assist junior faculty members in defending publication in the most relevant kinesiology journals and challenge potential abuse of bibliometric measures. Bibliometric measures alone are not adequate to document the influence of multidisciplinary or subdisciplinary journals in kinesiology.

Limitations of the present study include subjectivity in the journals indexed and classified as aligned with kinesiology by each database, as well as subjectivity in the authors' exclusion of highly ranked journals classified as primarily medical rather than related to the field of kinesiology. Despite these limitations and other subtle differences between the databases (see Delgado-Lopez-Cozar & Cabezas-Clavio, 2013), the following conclusions seem warranted. The bibliometric indices in the 40 highest rated kinesiology journals by the three most commonly used databases were qualitatively similar or slightly lower than other related scientific disciplines in

education and allied health. Despite variations in how bibliometirc variables are calculated and what journals are indexed, moderate associations were found between SJR and IF2 in top kinesiology journals.

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