Dynamic Chiropractic

CHIROPRACTIC (GENERAL)

Impact of the Chiropractic Literature

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The prime directive of clinical research is to improve patient care. The presumption is that evidence-based / evidence-informed care applies the best available evidence derived from the scientific method.[1-2] This is accomplished through a complex interaction among scientists who read, judge, replicate and choose to acknowledge or ignore the work of other researchers who are exploring the same or similar clinical questions.

Merton suggests that the more widely scientists make their intellectual property freely available to others, the more securely it becomes identified as their property. Citations and references thus operate within a jointly cognitive and moral framework. In their cognitive aspect, they are designed to provide the historical lineage of knowledge and to guide readers of new work to sources they may want to check or draw upon for themselves. In their moral aspect, they are designed to repay intellectual debts in the only form in which this can be done: through open acknowledgment of them.

As Merton emphasizes, "The greatest ambition of a productive scientist is to do the kind of work that will be much used and much esteemed by fellow scientists best qualified to assess its worth ... since recognition by qualified peers is the basic form of extrinsic reward."[3] The watchword, then, is: publish or perish.

References vs. Citations

A *reference* occurs when an author includes a bibliographic footnote or endnote to another author's published work. *Citations* represent the number of times that a particular paper appears in the references of other published work, including referencing one's own work. Citations symbolize the conceptual association of scientific ideas identified by the research authors, and their referencing patterns make explicit the links they deem important between their current research and the relevant prior work stored in the archive of scientific literature.[4]

However, there is growing concern that there are too many researchers publishing poor-quality articles in too many inadequately refereed journals. For example, about 10,000 English-language science journals publish more than 1.35 million scientific articles every year; this publishing deluge continues to grow at a rate of 3.26 percent per year, or nearly doubling within 20 years. Given that a typical article ranges in length from 3,000-10,000 words, this represents a substantial burden of time on editors and peer reviewers.[5-6]

A compelling opinion that is gaining momentum in academia is that the majority of new scientific research contains too little useful information to merit citation, all the while contributing to the avalanche of ignored research and clogging up the peer-review process.

In 2009, Jacso reported that only 40.6 percent of the articles published in the 4,500 top scientific journals were cited within the first five years after publication.[7] This represents the *cited half-life* of an article and is the calculated point, measured in years, of the rate of decline of the citation curve;

that is, the point in time when 50 percent of the citations are under, for example, five years old and 50 percent are older than five years. It is a measure of how long articles in a journal continue to be cited after publication.

Citations for articles published in a given year rise sharply to a peak between two and six years after publication and then decline exponentially.[8] The fact that a relatively small number of journals publish the bulk of influentially significant scientific results is referred to as Bradford's Law.[9] The implication is that a single citation from a high-quality journal may be more valuable than multiple citations from publications having less impact.

Tracking Citation Frequency

Thomson Reuters, based in Toronto, publishes the annual *Journal Citation Reports* (*JCR*) impact factor, which is a measure of the frequency with which the average article in a journal has been cited during a specified period. The impact factor is calculated by dividing the number of current-year citations to the source items published in that journal during the previous two or five years.

The *immediacy index* of a journal measures how often authors cite the most recent articles from a particular journal. This is an important indication of how rapidly the average paper from that particular journal is adopted into the literature.[10]

A citation analysis of 7,621 science journals by Thomson Reuters revealed that the top 300 scientific journals accounted for more than 50 percent of what was cited in the literature in 2008. Citation data is used by librarians to select key journals for their library's collection; by researchers when deciding where to submit their manuscripts to achieve the greatest impact; by funding bodies in evaluating grant proposals; and by college and university committees in deciding tenure.[11]

Christenson and Sigelman studied journal prestige as a factor on impact and found that there is a nonlinear relationship between a journal's reputation and its impact. Their conclusion was that citation data permit scholars to evaluate the importance of journals based on the frequency of citations, rather than on opinion; and that the frequency of citation implies scholarly acceptance, or at least acknowledgment of some importance of the cited work.[12]

Citation analysis is used to quantify the frequency with which defined user populations access information as it is circulated through the published literature. Citation analysis assesses the interaction between disciplines and is helpful in tabulating and categorizing citations. In other words, is there a pattern to the number of times articles in specific journals cite articles in journals that have a specialized focus?

Impact factors have proved to be very useful in clarifying the significance of absolute (or total) citation frequencies. It also eliminates some of the bias favouring large journals over smaller ones, and journals that are published more frequently compared to ones that are published less often or older, more established journals versus new journals. Impact factors are typically used to compare journals and to rank them. It is an objective way to measure journal quality. Impact factors are also known as bibliometric indicators or quantitative measurements of the quality of research papers, the authors and their associated institutions.[13]

Our Growing Research Presence

Doctors of chiropractic should be aware of the contribution our growing cadre of Canadian

researchers are making in terms of articles published in the most highly cited journals. These high-impact journals are also the most difficult to get published in, so the accomplishment is doubly significant. For a good but by no means exhaustive introduction to the chiropractic research scene, go to www.pubmed.com and type in any of the following names to view their co-authors and citations, and notice how often they have been published in the best journals: Ammendolia C., Bishop P.B., Blouin J-S, Busse J., Bussieres A., Cassidy J.D., Cote P., Dagenais S., Descarreaux M., Erwin M., Hayden J.A., Kawchuk G., Kopansky-Giles D.R., McGregor M., Mior S., Nolet P., Quon J., Srbely J., van der Velde G., and Vernon H..

Making an Impact: Top-Ranked Spine-Related Journals

The following table lists the most influential spine-related journals in terms of citations, impact factors, immediacy index and cited half-life for the 2009 citation period. The journals are ranked from first to 14th and represent the preferred choices for researchers when considering publication options related to the spine.

Rank	Abbreviated Journal Title	Citations	Impact Factor	5-Year Impact Factor	Immediacy Index	Number of Articles	Cited Half-Life in Years
1	*Osteoarth Cartilage*	6425	3.888	4.577	0.673	217	5.1
2	*Am J Sport Med*	13031	3.605	4.142	0.492	297	8.6
3	*J Bone J Surg Am*	31317	3.427	4.238	0.293	441	>10
4	*J Orthop Res*	9974	3.112	3.385	0.463	246	7.9
5	*Spine J*	2152	2.902	Too new	0.771	118	4.2
6	*J Bone J Surg Br*	16267	2.665	3.199	0.391	297	>10
7	*Spine*	30673	2.624	3,278	0.257	564	8.8
8	*Arthroscopy*	7547	2.608	2.706	0.92	188	6.3
9	*Gait Posture*	4011	2.576	3.145	0.405	222	5.2
10	*J Orthop Sport Phys*	2817	2.482	2.434	0.395	76	9.3
11	*Injury*	5647	2.383	2.096	0.278	273	6.3
12	*Phys Ther*	5568	2.082	2.742	0.948	115	9.9
13	*Clin Orthop Relat Res*	29213	2.065	2.661	0.358	411	>10
14	*Eur Spine J*	4234	1.956	2.328	0.13	277	4.9

Adapted from: Journal Citation Reports, 2009 JCR Data Release. Thomson Reuters, 2010.

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