Journal Rating Analysis of Faculty of Nursing Publications: 2007 - 2011

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Introduction

Researchers publish their articles in journals that maximize exposure to their target audience so that their work can have the greatest possible impact on their discipline. Measuring the impact and value of a researchers’ contribution to their discipline is an important consideration used by both promotion and awards committees and grant funding committees in their decision making (Johnston, 2007). In order for a publication to have the greatest impact, researchers want to publish in journals that receive the greatest amount of attention. “Quality” journals tend to receive more attention than poor “quality” journals. There are many factors to consider in determining the quality of a journal, such as the number of citations received, the readership, the journal’s reputation, and the quality of the editorial process. Seven rating systems used to rate journal and/or publication quality are discussed here, including the Institute for Scientific Information (ISI) Journal Impact Factor, SCImago SJR score, Google Scholar, Eigenfactor, Journal Evaluation Tool (JET), McMaster Online Rating of the Evidence (MORE) and Source-Normalized Impact per Paper. The h-index, a system used to rate individual researcher’s impact, is also discussed.

This report has three purposes: 1) To provide an overview of the different journal rating systems; 2) To analyze the Faculty of Nursing publications between 2007 and 2011 using the two most widely used journal rating systems (Impact Factor and SJR Score) and to examine the percentage of Faculty of Nursing publications appearing in these two systems; 3) To determine the distribution of h-indexes of tenure track faculty in the Faculty of Nursing, University of Manitoba.

1) Overview of Journal Rating Systems

a) ISI Journal Impact Factor

The number of citations a journal receives is one determinant commonly used to measure its impact. The Journal Impact Factor (JCR) is the most popular and familiar journal quality metric used in academia. The JCR is calculated by dividing the number of citations of a journal in a given year by the number of articles contained in that journal in the previous two years. In the mid-1990s, the Journal Impact Factor became the predominant measure of a journal’s influence and, hence, the influence of articles published within the journal (Archambault & Lariviere, 2009). On an annual basis, Thomson Reuters ISI Web of Science calculates and publishes Journal Citation Reports containing the Journal Impact Factor, Immediacy Index, and Cited Half-life of over 6,000 journals. The Journal Citation Reports are available in two editions, a Science Edition and a Social Sciences Edition, which contain overlapping content. The 2011 Sciences and Social Sciences editions contain 8,336 and 2,966 journals, respectively.

How are the impact factor, immediacy index, and cited half-life calculated?

The journal impact factor is calculated by dividing the number of citations to the articles published in a journal in a particular year by the total number of articles published in the previous two years. On average, journals with a higher impact factor receive more citations to their articles than journals with a
lower impact factor. The greater the impact factor of a journal, the greater the level of impact and prestige associated with publishing in that journal.

The *immediacy index* is the number of citations a journal’s articles receive in a given year divided by the number of articles published in the journal that year.

The *cited half-life* is the median age of the articles that were cited in Journal Citation Reports each year. The reports also list other information about the journals, such as the ID number or ISSN, the number of citations the journal has received, and the number of articles published in the journal during the reporting year.

**Nursing journals within ISI Web of Science**

There are 101 unique nursing journal titles that appear when searching under the “nursing” category in ISI Web of Science (Appendix A). While this number has grown over the last ten years (see Figure 1), this represents only a small fraction of nursing journals. For example, the CINAHL database has holdings for > 3000 nursing and allied health journals. Only 36% (9/25) of the ISI Web of Science covered journal titles in which faculty members published in 2011 also appear in the ISI Web of Science database in the “nursing” category of the ISI Web of Science database. The database currently lists 42 nursing journals with an impact factor rating of 1 or greater. The five highest rated nursing journals include: ONCOLOGY NURSING FORUM (2.509), BIRTH – ISSUES IN PERINATAL CARE (2.182), INTERNATIONAL JOURNAL OF NURSING STUDIES (2.178), CANCER NURSING (1.792), MIDWIFERY (1.777).

**Online tool to determine ISI Journal Impact Factor**

1. To determine impact factors for journals, go to the following website: http://www.isiknowledge.com

2. Under "Additional Resources" click "Journal Citation Reports"
3. Under "Select an Option", leave it at the default setting ["JCR Science Edition 2011", "View a group of journals by Subject Category"] [You can also choose to search for a specific journal or search using the JCR Social Sciences Edition]

4. Click SUBMIT

5. Scroll to NURSING and select; again, click SUBMIT

You will get a chart of nursing titles and associated statistics.
Searching for a Specific Journal

1. To search for a specific journal title like the “Journal of Advanced Nursing”, go to the ISI Web of Science home page and repeat Step 2 in the previous section.

2. Instead of leaving it at the default, choose “Search for a specific journal”

3. Click SUBMIT

4. You will be presented with a screen containing a fillable box with “Type search term” printed above it. Enter the journal name (e.g. “Journal of Advanced Nursing”) into this box and then click on the “search” box located just below it.

5. The journal metrics for the Journal of Advanced Nursing will be displayed including the total citations received, impact factor, 5-year impact factor, immediacy index, number of articles, cited half life, Eigenfactor and Article of Influence Score.
Figure 1 – The number of journals appearing in the Sciences Edition of the ISI Journal Citation Reports under the category of nursing by reporting year.

![Total # of Nursing Journals in ISI Sciences Edition](image)

Figure 2 – The number of journals appearing in the Social Sciences Edition of the ISI Journal Citation Reports under the category of nursing by reporting year.

![Total # of Nursing Journals in ISI Social Sciences Edition](image)

As shown in Figure 1 and 2, after a period of many years of stability in the low 30s, the number of nursing journals contained within the ISI Journal Citation Reports began to increase in 2007. The
combined total of unique nursing journals contained within the two editions of the reports rose to 46 in 2007, 64 in 2008, and 75 in 2009, 91 in 2010 and 101 in 2011.

b) **Google Scholar searched using Publish or Perish**

Google Scholar (http://scholar.google.ca), an open access online resource, is another citation tracking tool that is that can be most effectively searched using the program Publish or Perish. This program is available for free download at [http://www.harzing.com/download/PoPSetup.exe](http://www.harzing.com/download/PoPSetup.exe). Publish or Perish can be used to search an author to find his/her publications, the number of citations received for each publication, and other author citation metrics. The program finds citations contained in a much wider range of sources than the ISI Web of Science. Potential sources of citations may include journal articles, books, book chapters, theses, reports, and web pages. It also includes foreign source citations, which are not written in English. The program can also search for specific journal titles but the metrics produced are not meaningful, as the search results will only display the citations for the first 1,000 publications located. Another issue with the program is that it occasionally lists citations from the same source multiple times, especially citations from lower quality sources, such as reports and web pages, which do not have a peer-review process. Google Scholar appears to be a better source for individual citation analysis rather than a reliable source for obtaining journal metrics.

c) **SCImago**

One shortcoming with the ISI Journal Impact Factor measure is that it does not discriminate the quality of the citing source. To solve this shortcoming, an alternative database of journal citation metrics was developed by researchers in Spain named the SCImago Journal Rank Indicator (SJR) (www.scimagojr.com). The SJR score expresses the average number of weighted citations received in the selected year by the documents published in the journal over the previous three years. It offers important improvements over the ISI Impact Factor database (Falagas *et al*, 2008). SCImago Journal Rank Indicator (SJR) measures the scientific influence of the average article in a journal by assigning greater weight to citations from higher ranking journals. Using a Page Rank algorithm to calculate its journal rank, it expresses how central an average article of the journal is to the global scientific discussion. It offers important improvements over the ISI Impact Factor database. SCImago has a greater breadth of coverage for health sciences literature, as it relies on data supplied from Scopus, which includes 100% MedLine coverage and more. It total, it includes 18,732 journals, many of which are not tracked by the ISI database. SCImago’s journal rankings are also more stable as they incorporate data from a wider range of years. The ISI Impact Factor looks at a single year of citations to articles published in the two preceding years, but the SJR calculation looks at a single year of citations to articles published in the three preceding years.

**Nursing journals within SCImago**

There are 380 unique journal titles under the subject category “nursing” on the SCImago website. This is much more than the 75 nursing journals listed in ISI. However these journals appear to be more inaccurately defined as nursing journals in SCImago. In the 2009/10 Annual Report, members of the Faculty of Nursing at the University of Manitoba have published in only 44% (17/39) of the journals in
the “nursing” category of the SCImago database. Many journals are absent from the nursing category, even though they are obviously nursing journals since they have the word “nursing” in their titles (e.g. “Canadian Journal of Cardiovascular Nursing” and “Cancer Nursing”). It is better to search for individual journal titles separately in the database, rather than browse the nursing category list. The five highest rated journals in the database are: CELL (13.754), NATURE GENETICS (13.236), ANNUAL REVIEW OF IMMUNOLOGY (11.815), A CANCER JOURNAL FOR CLINICIANS (11.298), and ANNUAL REVIEW OF BIOCHEMISTRY (9.947).

The five highest rated journals in the “nursing” category are: JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY (1.855), PROGRESS IN LIPID RESEARCH (1.528), AMERICAN JOURNAL OF MEDICINE (0.480), OBESITY (0.410), and JOURNAL OF PAIN (0.375).

**Online tool to determine SCImago SJR score of a journal**

1. To determine the SCImago SJR score of a journal, go to http://www.scimagojr.com

2. On the left menu, click “Journal Rankings” and you will be presented with a list of all the journals in alphabetical order that are currently ranked by SCImago.

3. You can limit the search by “subject area” or “subject category” by selecting a subject from the drop-down menus and then clicking on “refresh”.

4. From the “subject area” menu, select “nursing” and click “refresh”. This will present you with a list of all the journals identified as nursing journals. The SJR scores are reported in the first column.
5. If you can’t find the journal you are looking for, click “Journal Search” on the left menu.

6. Type the name of the journal you are looking for into the “search query” box provided and click “search”. If the journal is contained in the database, it will present you with the title underneath the “search query” box.
7. Click the journal title displayed to see data and charts about the journal’s citation analysis.

8. Click the “Charts” and “Data” tabs to move back and forth between the graphical plots of the citation analysis and the actual citation data by year.

d) Eigenfactor

The website named Eigenfactors.org publishes two metrics called the Eigenfactor Score and the Article Influence scores. These metrics are calculated using a PageRank algorithm, similar to that used by SCImago, which examines the number of connections that occur between journals. However, the data used to produce these journal metrics are derived solely from ISI Web of Science data; therefore, they do not offer the same breadth of coverage as SCImago. The Eigenfactor Score examines articles from the journal that were published in the past five years to measure the number of times they have been cited in the JCR year and weighs these citations using an algorithm, which estimates the percentage of time journal readers spend reading the journal. It is based on the premise that researchers find a sizeable number of the publications they read through the reference lists contained within a journal article. Therefore, the more connections that are made to journal A from other journals (B), the greater the likelihood that a reader will seek out an article in journal A and, therefore, the more times journal A will be read. The Article Influence Score measures the relative importance of the journal on a per-article basis. It is the journal’s Eigenfactor Score divided by the fraction of articles published by the journal. The resultant fraction is normalized so that the sum total of articles from all journals is 1.
The mean Article Influence Score is 1.00; a score of greater than 1.00 indicates that each article in the journal has above-average influence, while a score of less than 1.00 indicates that each article in the journal has below-average influence. This score is more comparable to the Impact Factor score, as it incorporates number of publications and citations into its formula, while using a more complex calculation than the Impact Factor. Both the Eigenfactor Score and Article Influence scores are also reported in ISI’s Journal Citation Reports, starting in the 2007 edition.

e) Journal Evaluation Tool (JET)

In 2010, a new Journal Evaluation Tool (JET) was published to evaluate journals publishing in the Nursing & Midwifery disciplines of Australian and New Zealand researchers (Crookes, 2010). This ranking system was developed in August 2006 by the Centre for Health Initiatives at the University of Wollongong, Australia in conjunction with the Council of Deans of Nursing & Midwifery (http://www.uow.edu.au/health/chi/jet/index.html). Like the Allen Scoring system, the JET goes beyond ranking journals based on citation numbers. In addition to considering a journal’s ISI Impact Factor, a number of subjective criteria are evaluated, including editorial standards, types of articles included, and format of the publication. The developers met with leading nursing and midwifery bodies, utilizing both a Delphi survey process and a focus group design, with an expert panel to identify the criteria for the journal evaluation tool. The tool was tested on an initial list of 52 journals and the current list contains approximately 158 journals. The author’s planned to update the list annually but no further updates have yet become available.

f) MORE

The Health Information Research Unit at McMaster University has a system of evaluating the quality of individual research articles through a system called McMaster Online Rating of Evidence (MORE) (http://hiru.mcmaster.ca/hiru/HIRU_McMaster_PLUS_projects.aspx). The current list of 124 journals (Appendix C) is read to identify articles with the strongest methods for clinical attention. Only about 8% of articles read are ultimately selected for rating. Those chosen are critically appraised by at least four expert raters from each discipline to which the article relates. The raters evaluate the articles on two 7-point scales. The first scale, for relevance, measures the extent to which the article is pertinent to practice. The second scale, for newsworthiness, measures the extent to which the article’s content represents news or something that clinicians were unlikely to know. The average scores from the raters are calculated and those scoring at least three on each of the two scales are added to the reporting database. Each major discipline has its own database. The Nursing database is called “Nursing+ - Best Evidence for Nursing Care” and is located at: http://plus.mcmaster.ca/np/Default.aspx

McMaster University, through their MORE rating system, is attempting to measure the quality and influence of individual publications through an evaluation process involving scrutiny of the methods, analysis, and results as well as relevance to impact practice. However, due to the large amount of resources required in this process, only a relatively low number of journals are scrutinized (124 as of November 6th, 2012).
g) SNIP

The Source-Normalized Impact per Paper (SNIP) is a journal citation impact measure recently created by Professor Henk Moed at CTWS, University of Leiden, Netherlands. It contextualizes the citations a journal receives by weighting citations according to the total number of citations in a particular subject field. The impact of a citation in a less highly cited field is given more weight than in a field that receives more citations and vice versa. SNIP is defined by the ratio of a journal’s citation count per paper and the citation potential in its subject field. It attempts to allow direct comparison of citations counts to journals in different subject areas. Journal ratings using this measure are reported on www.journalmetrics.com.

h) H-index

The h-Index is a popular metric developed by Jorge Hirsch (Hirsch, 2005) that is used to quantify the impact and relevance of an individual researcher’s publications. A researcher has an h-index of x if y of his or her papers have at least z citations each and the remaining papers have less than z citations. Scopus and Web of Science both report the h-Index for individual authors.

In summary, the 2 most commonly used journal ratings systems are the ISI Journal Impact Factor and the SCImago SJR score. Below is an analysis of the faculty journal publications of the Faculty of Nursing, University of Manitoba using these two journal rating systems.


Methods

Faculty member publications appearing in the University of Manitoba, Faculty of Nursing Annual Reports from 2006/07 to 2011 were analyzed to determine the frequency of faculty member journal publications that appear in ISI and SCImago rated journals. The distribution of these publications among lower and higher rated journals was also examined. “In-press” publications were omitted from the analysis. The ISI Impact Factor and SCImago SJR score were chosen, as they are the predominant journal citation analysis databases in use and contain a significant number of the journals in which Faculty of Nursing members publish their work.

Analysis

The analysis was done to examine the Journal Ratings in which members of the Faculty of Nursing, University of Manitoba have published. Specifically, we were interested in examining the percentage of faculty publications appearing in ISI Web of Science, SCImago, and non-rated journals. In addition, we were interested in exploring whether there is an increase in the percentage of faculty publications in journals rated in both ISI Web of Science and SCImago over the five years. We were also interested in exploring whether there is an increase in faculty publications appearing in higher rated journals in both ISI Web of Science and SCImago.
Figure 3 – The total number of Nursing Faculty publications in journals rated and unrated in the ISI Web of Science database.

*Data extracted from Faculty of Nursing annual reports from 2006/2007 to 2011.

- As shown in Figure 3, there has been variability over time in the percentage of faculty publications appearing in ISI rated journals. However, this percentage has been greatest in the last two years (60% in 2010 & 2011).

- The percentage of Faculty publications that appear in ISI Rated journals has ranged from a low of 40% in 2008 to a high of 60% in 2010 & 2011.
Figure 4 – The total number of Faculty publications in journals rated and unrated in the SCImago database.

- As shown in Figure 4, a large percentage of faculty publications have appeared in SCImago rated journals over the last 5 years.

- The percentage of Faculty journal publications appearing in SCImago rated journals has ranged from 79% in 2010 to a peak of 98% in 2007.

- When comparing Figures 3 and 4 it is clear that the journals in which nursing faculty are publishing are consistently much more represented in the SCImago database than in the ISI Web of Science. This reflects the greater number of journals that are ranked by SCImago.

*Data extracted from Faculty of Nursing annual reports from 2006/2007 to 2011.*
Figure 3 - The distribution of Faculty publications in journals with ISI Impact Factor Ratings, grouped from 0-1, 1.001 to 2.0, and >2.0 points.

*Data extracted from Faculty of Nursing annual reports from 2007/2008 to 2011.

- Publications appearing in journals having an ISI rating are graphed according to the percentage appearing in each of three rating categories.

- After a spike in 2008 to 52% followed by a decline the next year, there has been a gradual increase in the percentage of nursing faculty journal articles appearing in high ranking journals (ISI Impact Factor of greater than 2.0), rising back to 47% appearing in high ranking journals in 2011.
Figure 4 - The distribution of Faculty publications in journals with SCImago Journal Rank (SJR) scores, grouped from 0-0.0602, 0.0602 to 0.1778 and > 0.1778 points.

*Data extracted from Faculty of Nursing annual reports from 2006/2007 to 2011.

- Over the five year reporting period, the percentage of articles published by faculty members in high rated journals (SJR points greater than 0.9) has increased from 25% in 2009 to 35% in 2011 after hitting a low of 13% in 2008.
Disadvantages of Rating Journals Based on Citation Numbers

Impact factors allow for an objective comparison to be made between journals to compare the quality of journals as measured by citation numbers (Neuberger & Counsell, 2002). The Impact Factor is a well-established measure that is produced through a simple calculation. It is also publicly available online (http://www.isiknowledge.com) and updated on an annual basis (Nisonger, 2004). However, there have been many criticisms of the impact factor as a measure of journal quality, some of which are listed here:

1. Assume that all research publications appearing in a high impact factor journal have the same impact. In most cases, as few as 10-20% of a journal’s articles can account for most of its citations (Williams, 2007).

2. A publication may be cited many times to point out a flaw in the study design or analysis (Williams, 2007).

3. Discourages research in areas that are not main stream, as there are fewer people working in these areas and, therefore, these people would receive fewer citations to their work (Gottlieb & Clarke, 2005; Ironside, 2007).

4. The most prestigious journals in different disciplines may have greatly varied impact factors, making cross-discipline comparisons difficult (Smith, 2008).

5. Impact factor is not as important for practice-based disciplines in which the impact of the research could be more accurately determined by measuring the influence on practice methods, programs, and policies. For Nursing Researchers, emphasis should be on the influence their research has had in their area of practice, rather than whether or not they published in high impact journals (Johnstone, 2007).

6. A journal not indexed in ISI or SCImago may be the best place for a researcher to publish if it reaches the intended audience (Jackson et al, 2009).

7. Impact factors create a tension between meeting the demands of Tenure committees, funding bodies, and the academic community, who view a research program more favorably if you have published in high impact journals, and your desire to publish in a journal that reaches a particular target audience, yet has a low impact factor (Johnstone, 2007).

8. The Canadian Institute of Health Research (CIHR) introduced a mandate in 2007 that states “Grant recipients are now required to make every effort to ensure that their peer-reviewed publications are freely accessible through the Publisher's website or an online repository as soon as possible and in any event within six months of publication.” (http://www.cihr-irsc.gc.ca/e/34846.html). This mandate may make it more difficult for CIHR funded researchers to publish in a high impact journal if the journal happens to not allow their content to be made available in this way.

9. Publications in English, especially American sources, are likely to receive a greater number of citations and are more likely to be indexed by ISI or SCImago (Smith, 2008).
10. Journals containing a greater number of review articles tend to have higher impact factors, as review articles generally lead to a greater number of citations than original research articles (Gottlieb & Clarke, 2005).

**Searching for an Ideal Journal Rating System**

Journal Ratings provide a tool to evaluate journal quality through the measures used in the evaluation. However, no single rating system has been developed that fully encompasses all the factors that should ideally be taken into account when evaluating journal quality. In addition, no single rating system is equally good at evaluating all research disciplines. A journal rating system that measures citation numbers, journal quality, and prestige would be a better fit for pure science research than for research that seeks to influence policy and practice, as is often the case in the nursing field. In practice-based disciplines, such as nursing, the influence of researcher’s work could be more accurately measured through its degree of influence on clinical practice, policies, or programs (Ironside, 2007). In addition, in nursing research it is problematic to place high emphasis on journal quality measures, as pressure to publish in high impact journals may persuade a nursing researcher to publish in such a journal, even though this may reduce the researcher’s ability to influence policy and/or clinical practice.

The impact of online journals can also be measured by the number of times that the article is downloaded. An online journal publisher called BioMed Central records the number of times journal articles are downloaded and reports this to the authors as a measure of the article and journal’s popularity.

Nursing research may have a significant impact when it is read and utilized by people who incorporate study findings into their work, such as is the case with evidence-based practice (Smith & Hazelton, 2008). Clinicians will use research findings in their practice but are unlikely to publish and, therefore, cite any of the research themselves.

A system of rating nursing journals needs to be developed to evaluate the majority of these titles through an efficient process that considers the many factors involved in determining the quality and influence (Broome, 2005), including citation numbers; quality of editorial process; and impact on practice, policy, and programs.

**3) The H-Index of Individual Faculty Members**

Both Scopus and Web of Science report the h-indexes of individual researchers based on the citation data contained within their respective databases. Of the two, Scopus contains citation data from a larger number of journals, but does not contain complete citation data from before 1996. Therefore, citations from before 1996 are not included in the h-index that Scopus calculates. Since Scopus is the superior source for recent citation data, we searched the names of all tenure track faculty of the University of Manitoba, Faculty of Nursing to determine the distribution of their h-indexes. The Scopus h-indexes of the 24 tenure track nursing faculty at the U of M are categorized in Figure 5 for all full professors, associate professors and assistant professors combined. Three faculty had an h-indexes <= 2, eleven had values of 3 to 6, six had h-indexes of 7 to 15 and four fit into the highest h-index category of 16 to
25. The average h-index for all tenure track faculty is 7 ± 4 (SD). The mean h-index of full professors is 19 ± 6 (SD), associate professors is 6 ± 2 (SD), and assistant professors is 3 ± 3 (SD). The mean h-index of nursing Faculty by rank has not be reported elsewhere, but urology Faculty reported a similar association of the h-index by Faculty rank with mean h-indexes of 21 for full professors, 14 for associate professors, and 7 for assistant professors (Benway et al, 2009). Anesthesia Faculty had mean h-indexes of 16 for full professors, 9 for associate professors, and 2 for assistant professors (Bould et al, 2011).

Figure 5 – The Scopus H-indexes of all tenure track Faculty from the University of Manitoba, Faculty of Nursing displayed by category, with self-citations removed (n=24).

Summary

This report has shown that there are a number of systems that can be used to evaluate journal quality. The ISI Web of Science Impact Factor is the most commonly used metric system for measuring a journal’s prestige through citation numbers. However, this analysis demonstrated that journals containing Faculty of Nursing publications are better represented in the SCImago database (>79% coverage) than in the ISI Web of Science (40-62% coverage). Due to its greater coverage of the nursing discipline, SCImago’s SJR score should also be considered when choosing a journal according to its quality metric. However, caution must be exercised when relying solely on either journal metric system, as these represent only one measure of journal quality. Other measures may be as important or even more important in decisions related to publication.

The h-index is one of the most popular metrics used to measure an individual Faculty member’s publication impact and relevance. However, other measures of research success are equally important, such as number of citations received, number of publications produced, number of times an article is downloaded from an online journal, and impact of research on bringing about change in policies and practice.
References


