



Impact factors in nursing journals

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ABSTRACT

Journal impact factors (IFs), a measure of citation frequency, are published annually in *Journal Citation Reports (JCR)*. Journal IFs, although controversial because of the uses to which they have been put in academic arenas, remain a metric about which nurses should be informed. This paper discusses key issues in the controversy, explains how IFs are computed, and presents historical and 2009 IF data for nursing journals. The number of nursing journals indexed in JCR has grown from 35 in 2004 to 74 in 2009. The journals currently indexed are diverse in terms of focus (practice vs research), specialty areas, and country of publication. The median IF score for nursing journals (0.91 in 2009) is similar to that for several other health care categories. Given the controversies surrounding IFs, it may be useful for nurses to play a more active role in furthering the debate by undertaking research relating to IFs, including studies of how they affect nurses' scholarly pursuits and publication decisions.

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Journal impact factors (IFs) are scores based on citation analysis that are calculated annually through Thomson-Reuters' Institute of Scientific Information (ISI) and published in the *Journal Citation Reports (JCR)* each June for the preceding year.¹ Journal IFs are one of many available metrics of journal performance that involve an analysis of citation frequency—that is, counts of how frequently articles in the journal are cited by other articles in the subsequent 2-year period. Specific details about the calculation of IFs are described later in this paper.

IFs have been criticized by many scholars and researchers, both on conceptual and technical

grounds.^{2–6} Yet, IFs remain widely-used indicators that are difficult to ignore by nurses in academia because of their increased use by those on appointment, promotion, tenure committees,^{3,7,8} by funding agencies,^{5,9} by university administrators making resource allocation decisions to departments,^{3,10} and by governments undertaking reviews of the overall impact of research outputs, such as occurs in Australia, England, and some Asian countries.^{2,9,11,12} Consequently, nurse researchers, scholars, and editors need to have a firm understanding of how this bibliometric index works, what IFs mean, and what their limitations are. The purposes of this article are to (1) explain IFs and some related indexes; (2) describe the major concerns that have been

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expressed about IFs; (3) discuss how nursing journals have fared in the IF system, both historically and compared with other academic disciplines; and (4) present IFs and other metrics of nursing journals for the journal year 2009, the most recent year available.

Background

The idea of an IF was first described by Eugene Garfield, founder of ISI, in an article published in *Science* in 1955.¹³ With support from the National Institutes of Health, Garfield and a colleague created journal IFs in the early 1960s as a means of selecting journals to be indexed in the *Science Citation Index*.¹⁴ This index, part of a larger set of indexes known as the Web of Science, is a database that many researchers use in conducting literature searches and in tracking how often articles they have written are subsequently cited.²

Journal IFs were first published in JCR in 1972.¹ In the early years, IF scores were of interest primarily to librarians, who had to make decisions about library acquisitions, and to publishers, who had to evaluate journal viability.^{4,7} By the 1990s, however, IFs increasingly were being considered as an indicator of journal prestige and quality. This in turn evolved into the use of journal IFs as surrogate measures of article quality.^{5,15,16} Many academic institutions, for example, have come to require journal IF information for publications listed by its faculty applicants, and by those seeking tenure and promotion.^{3,7,8} This practice, considered to have “inherent dangers” by IF founder Garfield,¹⁷ was not part of the original intent of IFs.

Critics of journal IFs have raised numerous objections about its uses and alleged abuses, as well as concerns about technical aspects of this metric. Critics have pointed out, for example, that because journal editors presumably attain some gratification by achieving high IF scores, there may be a temptation to manipulate IFs.^{2-4,18} Editors could inflate IFs, for instance, by publishing numerous review articles (which are cited, on average, about twice as often as other articles¹⁷) and by encouraging self-citations.^{2,6} Critics have also condemned the two-year timeframe of the standard IF,^{2,3,5} the risk of citation errors,^{3,4} the IF’s bias toward English-language journals,^{5,11,15,19} and its bias toward journals based in North America.^{5,11} Many have noted the problems of comparing IF scores from different disciplines.^{5,9,20} Another concern is that IFs fail to account for skewness in the distribution of citations; a journal can attain a high IF, for example, if one article is cited dozens of times even if other articles in the journal are never cited.^{5,21}

At a conceptual level, critics have condemned the interpretation of IFs as an indicator of journal quality and, especially, article quality.^{2-5,9,12} Indeed, the

skewness of citation distribution has given rise to the so-called “free ride” hypothesis—ie, the claim that articles can be given a “free ride” of presumed higher quality and prestige simply by being published in a high IF journal.⁵ The trend in equating higher journal IF scores with higher prestige has been assailed as putting undue pressure on authors to publish in high-impact journals, even when the journals with the highest IFs might not be the most appropriate venue.^{2,4} Even more broadly, concerns have been raised that IFs have the potential to undermine scholarship in new areas,^{10,15,16} to force non-English-speaking academics to publish in English rather than in languages where the knowledge would be of greatest local use,^{2,10,11,15} to diminish the contribution of nontraditional methodologies and multidisciplinary work,^{2,22} and to discourage publication in scholarly books, which are not assigned IF scores.^{3,5,11}

Criticism of IFs has led to some changes by ISI. For example, JCR has expanded its coverage of non-English journals and now presents five-year as well as two-year IF scores, as well as IF values corrected for self-citation.¹ Two other journal metrics were developed outside of ISI to address concerns about capturing the quality as well as quantity of citations—the Eigenfactor Score (ES) and Article Influence Score (AIS)—and these are now presented in JCR.¹ A journal’s ES is calculated using a complex algorithm that assigns weights to the source of citations, and a journal’s AIS is derived from the ES.^{1,21} Although some writers have advised that all three scores should be considered in assessing the influence of journals,²¹ IF scores remain the most widely-used citation metric, and the scores that many journals display prominently on their websites. Part of the attraction of IF scores, compared with ES or AIS, might reflect its relative simplicity and ease of calculation.²²

Calculation of Impact Factors

A journal IF is calculated as a ratio of two numbers. The numerator is the number of times in a focal year (say, 2009) that articles in the journal were cited in the two prior years (here, 2007 and 2008) in other articles published in journals that are indexed by JCR. As an example, consider a highly-ranked nursing journal, the *International Journal of Nursing Studies* (IJNS), whose IF was 1.91 in 2009.¹ For the focal year 2009, a total of 554 articles published in any indexed journal in 2009 cited any article that was published in IJNS in 2007 or 2008.

The denominator of the journal IF reflects the number of articles published by the journal in the two prior years—in this example, 2007 and 2008. Some who have written about IFs in nursing journals imply, by failing to provide a precise definition, that the denominator reflects any article published in the two-year period.^{3,23} The denominator, however, represents the number of citable items published by the

journal in that period. A citable item is a substantive, scholarly article. In other words, the denominator of the IF formula consists of publications that are most likely to be cited by others and that have cited references themselves.²⁴ Journal items not counted as citable include letters, interviews, tributes, commentaries, book reviews, obituaries, and perspectives.¹⁴ For the focal year 2009, *IJNS* had 290 citable items in 2007 and 2008. The journal's IF for 2009 was calculated as:

$$\frac{554(\text{number of citations in 2009 to any article published in } IJNS \text{ in } 2007 - 2008)}{290(\text{number of citable items published in } IJNS \text{ in } 2007 - 2008)} = 1.91$$

Put simply, IFs indicate the number of times, on average, that a citable item in a given journal is in fact cited over a two-year period in journals indexed by JCR. For *IJNS*, the IF of 1.91 means that a "typical" article in that journal was cited about twice in a two-year window.

JCR now also publishes five-year IFs. The numerator of the five-year IF is the number of citations in a given year (eg, 2009) to items published in indexed journals in the previous five years (eg, 2004-2008). The denominator is the number of citable items in that five-year period. The five-year IF for *IJNS* in 2009 was 2.15 (1199 citations in 2009 divided by 557 citable items published in 2004-2008).

One anomaly of the IF score that is seldom discussed in the IF literature is that citations to an article during the year in which it was published are *never* counted in the IF score. For example, if an article published in *IJNS* in January, 2009 was subsequently cited in three articles published later in 2009, those three citations will never contribute to the journal's IF in any year. JCR does, however, calculate a metric called the Immediacy Index, which is the ratio of citations to articles published in a given year, divided by the number of citable articles published in that same year. For 2009, the Immediacy Index score for *IJNS* was 84 divided by 158, or 0.53. The 84 citations in the numerator will never be included in any IF score—nor in any Immediacy Index after 2009. Some critics of the IF who have claimed that editors can manipulate their IFs by publishing letters or editorials about an article^{4,5,25} may be unaware of this anomaly. Given that letters and editorials about an article typically appear within a few months of an article's publication, editors who attempt this strategy of manipulation would not have much success in inflating their journal's IF.

Impact Factors and Nursing Journals

JCR publishes two editions each year, a Science and a Social Science edition, and Nursing is a subject

category within both. The two lists overlap considerably, but a few journals in the Social Science edition are not in the Science edition, and vice versa.

Impact factors have been calculated for nursing journals for several decades. Although historical IF values are not available in the online version of JCR for years before 2004,¹ an article written in 1984 by Garfield, creator of the IF, explicitly discussed citation analysis in nursing.²⁶

According to that article, only 9 nursing journals had IFs in 1983, with IF values ranging from 0.07 (*Nursing Clinics of North America*) to 0.40 (*Nursing Research*). The median IF for nursing journals in 1983 was 0.27.

Between 1983 and 2003, the number of indexed nursing journals increased from 9 to 33.⁸ Given that more than 500 nursing journals were indexed in CINAHL by 2004, nurse editors who belonged to the International Academy of Nursing Editors (INANE) decided at their annual 2004 conference to lobby ISI for greater coverage of nursing journals. In part as a result of the efforts by Margaret Freda, the editor of *MCN* who represented 81 INANE nursing editors,⁸ the number of nursing journals included in JCR has grown markedly. [Table 1](#) shows that only 35 nursing journals were evaluated in 2004, but that the total number increased to 74 in 2009.

[Table 1](#) also shows that the median IF for nursing journals in both JCR editions has increased between 2004 and 2009. For example, in the Science edition, the median IF of nursing journals increased from .689 to .909 over that six-year period. The number of journals with IFs of 1.00 or greater has risen steadily, from 6 in 2006 to 30 in 2009 in the Science edition. The information in [Table 1](#) suggests, however, that adding journals to the list somewhat depresses the median. The median IF was at its peak in 2006 (1.014), when only 36 journals were indexed in the Science edition. This is consistent with the fact that JCR is broadening its coverage of the nursing field. Newly listed journals tend to be ones that are less likely to have numerous citations—often specialty journals with a narrow focus or non-English language journals. Indeed, in an analysis of JCR data dating back to 2004, we found that the 2009 median IF of nursing journals with a longer history of being indexed in JCR (2006 or earlier) was 1.05, whereas those journals added to the list between 2007 and 2009 had a median IF of 0.71 ($P = .001$).

For individual nursing journals, analysis of the historical data showed that IFs increased between 2004 and 2009 for 31 of the 33 journals (94%) that were listed in JCR in those years, and the median 2004 to 2009 increase was 0.43. This increase is consistent with trends toward higher IFs observed in other health care journals.^{17,18}

Table 1 – Changes to the Impact Factor (IF) in the Nursing Subject Categories, 2004-2009

	2004	2005	2006	2007	2008	2009
Total number of journals rated	35	33	37	46	64	74
Science edition of JCR*						
No. of nursing journals rated	33	32	36	46	62	72
Median impact factor	0.689	0.746	1.014	0.925	0.936	0.909
Number with IF ≥ 1.00	6	5	19	21	28	30
Social Science edition of JCR						
No. of nursing journals rated	32	29	32	42	59	70
Median impact factor	0.632	0.725	0.976	0.847	0.906	0.902
Number with IF ≥ 1.00	7	4	16	17	25	27

Journal Citation Reports (JCR), information retrieved June 19, 2010.

Nursing Journal Impact Factors in 2009

Table 2 shows the 2009 IFs for the 74 nursing journals rated in the most recent edition of JCR, and the ranking for the 72 journals in the Science edition. (Rankings for the Science edition are shown because there are more nursing journals in the Science than in the Social Science edition.) The table also indicates the edition of JCR in which each journal was ranked.

As shown in this table, nursing IFs in 2009 ranged from 0.17 (*Journal of Addictions Nursing*) to 1.94 (*Worldviews on Evidence-Based Nursing*). The distribution of IF values was positively skewed, and 61% of the journals had 2009 IFs lower than 1.00.

Some commentators have stated that it is difficult to attach any meaning to IFs because they fluctuate considerably from year to year.² Table 2 presents 2008 IFs (column 4) so that the issue of short-term stability could be examined. IF scores for most nursing journals were fairly steady between 2008 and 2009. For journals indexed in both years, the correlation in IF ratings was $r = .82$, and the median change for journals from 2008 to 2009 was $-.003$. Nevertheless, a few journals had noteworthy changes over the one-year period. The largest decline in 2009 was for the journal *Birth*, whose IF dropped from 2.84 in 2008 to 1.92 in 2009. The largest increase was for *Nursing Outlook*, whose IF score increased from 0.91 in 2008 (ranked 33 of 62) to 1.54 in 2009 (ranked 8 of 72). Another journal with noteworthy performance was *Worldviews on Evidence-Based Nursing* ranked number 1 in 2009 (IF = 1.94), despite its relatively short history.²⁷

Table 2 also shows the country where the journal is based and the other JCR subject categories with which nursing journals are cross classified. For example, *Archives of Psychiatric Nursing* is listed in Nursing in both editions of JCR, and is also listed in the Psychiatry subject category in both JCR editions. In the four lists in which this journal is included (two Nursing and two Psychiatry), its 2009 IF was the same (0.90), but rankings within a subject category varied. For example, the journal ranked 40 out of 72 in the Nursing (Science)

category in 2009, and 73 out of 94 in the Psychiatry (Social Science) subject category.

Table 2 indicates considerable diversity among IF-rated nursing journals on many dimensions. The list includes journals that are primarily research oriented (eg, *Nursing Research*) and those more often read by clinicians (eg, *American Journal of Nursing*). Among those with a research focus, some journals are more quantitatively oriented (eg, *Research in Nursing & Health*), whereas in others, qualitative studies are prominent (eg, *Journal of Transcultural Nursing*). Although some have expressed concerns that nursing specialty journals would be neglected in the IF system,¹⁶ the list includes both generalist journals (eg, *Journal of Clinical Nursing*) and a good representation of specialty journals (eg, *Cancer Nursing*, *Midwifery*, *Critical Care Nursing*). Some journals are ranked only in the Nursing subject category (eg, *Nursing Ethics*), but others are multidisciplinary and are included on multiple lists (eg, *Heart & Lung*, *Australian Journal of Rural Health*).

The majority of journals with 2009 IF ratings are based either in the United States or in England. Despite some claims that IFs are biased toward North American journals,¹¹ two of the five top-ranked journals are based in England. Country diversity improved markedly in 2009. Seven of the 10 newly added journals are from Australia, Brazil, Italy, and Japan. In 2008, there was no language diversity among journals in the Nursing subject category; they were all English-language journals. In 2009, however, two journals that publish articles in other languages (Italian and Portuguese) were added.

Within the Nursing subset, 37 journals indexed in 2009 had five-year IF scores ranging from 0.56 (*Geriatric Nursing*) to 2.60 (*Birth*) (not shown in tables). The correlation between the two-year IF and five-year IF for these journals was high ($r = .88$, $P < .001$), which is consistent with findings of high correlations between these two indexes in other disciplines.¹⁴

One of the questions that might be of interest to nurse authors is the degree to which nursing journal

Table 2 – 2009 Impact Factors for 74 Journals in the JCR Nursing Subject Categories

Name of Journal	Impact Factor, 2009	Journal Rank, 2009*	Impact Factor, 2008	JCR Edition [†]			Other Impact Factor Subject Category Listing [‡]	Country [§]
				Science	Social Science	Both		
<i>Advances in Nursing Science</i>	1.414	13	1.211			✓		USA
<i>American Journal of Critical Care</i>	1.658	7	2.043	✓			Crit Care Med ¹	USA
<i>American Journal of Nursing</i>	0.685	56	1.046			✓		USA
<i>Applied Nursing Research</i>	0.871	41	1.086			✓		USA
<i>Archives of Psychiatric Nursing</i>	0.897	40	0.732			✓	Psychiatry ^{1,2}	USA
<i>Assistenza Infermieristica e Ricerca</i>	0.205	71				✓		Italy
<i>Australian Journal of Advanced Nursing</i>	0.593	60	0.592			✓		Australia
<i>Australian Journal of Rural Health</i>	0.786	50				✓	Public Health ^{1,2}	Australia
<i>Bariatric Nursing & Surgical Patient Care</i>	0.911	37				✓		USA
<i>Biological Research for Nursing</i>	0.930	36	1.386	✓				USA
<i>Birth: Issues in Perinatal Care</i>	1.919	2	2.836			✓	Obstetrics/Gyn ¹	USA
<i>Cancer Nursing</i>	1.878	5	1.705			✓	Oncology ¹	USA
<i>CIN: Computers, Informatics, Nursing</i>	0.953	31	0.968			✓	Med Informatics ¹	USA
<i>Clinical Nurse Specialist</i>	0.737	52	0.906			✓		USA
<i>Contemporary Nurse</i>	0.497	64				✓		Australia
<i>Critical Care Nurse</i>	1.031	27	1.119			✓	Crit Care Med ¹	USA
<i>European Journal of Oncology Nursing</i>	1.126	22	0.976	✓				USA
<i>Gastroenterology Nursing</i>	0.465	66	0.538			✓	Gastroenterology ¹	USA
<i>Geriatric Nursing</i>	0.789	49	0.512			✓	Geriat/Gerontol ^{1,2}	USA
<i>Heart & Lung</i>	1.036	26	1.094	✓			Cardiac ¹	USA
<i>International Journal of Nursing Studies</i>	1.910	3	2.310			✓		England
<i>International Journal of Urological Nursing</i>	0.424	67				✓		England
<i>International Nursing Review</i>	0.693	54	0.644			✓		Switz.
<i>Japanese Journal of Nursing Science</i>	0.333	70				✓		Japan
<i>Journal of Addictions Nursing</i>	0.171	72	0.316			✓	Substance abuse ^{1,2}	USA
<i>Journal of Advanced Nursing</i>	1.518	10	1.654			✓		England
<i>J. Am. Academy of Nurse Practitioners</i>	0.907	38	0.823			✓	Health Care Serv ¹	USA
<i>J. of the Assoc. of Nurses in AIDS Care</i>	0.957	31	0.712			✓		USA
<i>Journal of Cardiovascular Nursing</i>	1.533	9	1.471			✓	Cardiac ¹	USA
<i>Journal of Clinical Nursing</i>	1.194	17	1.376			✓		England
<i>Journal of Community Health Nursing</i>	0.559	62	0.842			✓		USA
<i>Journal of Emergency Nursing</i>	0.359	69	0.399			✓	Emergency Med ¹	USA
<i>Journal of Family Nursing</i>	1.250	15	0.683			✓	Family Studies ²	England
<i>Journal of Gerontologic Nursing</i>	0.815	45	0.773			✓	Geriat/Gerontol ^{1,2}	USA
<i>Journal of Human Lactation</i>	1.014	29	0.815	✓			Obstetrics/Gyn ¹	USA
<i>Journal of Midwifery & Women's Health</i>	1.127	21	1.068			✓		USA
<i>Journal of Nursing Administration</i>	1.150	20	1.287			✓		USA
<i>Journal of Nursing Care Quality</i>	0.943	35	0.784			✓		USA
<i>Journal of Nursing Education</i>	0.867	42	0.840			✓		USA
<i>Journal of Nursing Scholarship</i>	1.459	12	1.070			✓		USA
<i>J. of Obstetric, Gyn., & Neonatal Nursing</i>	0.952	34	0.892			✓	Obstetrics/Gyn ¹	USA
<i>Journal of Pediatric Oncology Nursing</i>	1.029	28				✓	Oncology ¹	USA
<i>Journal of Perinatal & Neonatal Nursing</i>	0.824	43	0.895			✓	Obstetrics/Gyn ¹	USA
<i>Journal of Professional Nursing</i>	0.755	51	0.667			✓		USA
<i>J. of Psychiatric & Mental Health Nursing</i>	1.063	25	1.082			✓	Psychiatry ^{1,2}	England
<i>J. of Psychosocial Nurs & Ment Hlth Serv</i>	0.707	53	0.406			✓		USA
<i>J. for Specialists in Pediatric Nursing</i>	0.500	63	0.683			✓	Pediatrics ¹	USA
<i>Journal of Transcultural Nursing</i>	0.953	32	1.000			✓		USA
<i>J. of Wound, Ostomy & Continence Nursing</i>	1.173	18	0.820			✓		USA
<i>MCN: Amer. J. Maternal/Child Nursing</i>	0.793	48	0.800			✓		USA
<i>Midwifery</i>	1.163	19	1.042			✓		England
<i>Nursing & Health Sciences</i>	0.820	44				✓		Australia
<i>Nursing Clinics of North America</i>	0.634	58	0.430			✓		USA
<i>Nursing Economics</i>	0.798	47	1.165			✓		USA
<i>Nurse Educator</i>	0.487	65	0.660			✓		USA
<i>Nursing Education Today</i>	0.907	38	0.702			✓		Scotland
<i>Nursing Ethics</i>	1.075	24	0.962			✓		England
<i>Nursing History Review</i>	0.706	–	0.714		✓		History, Soc Sci ²	USA
<i>Nursing Inquiry</i>	0.691	55	1.246			✓		Australia
<i>Nursing Outlook</i>	1.541	8	0.910			✓		USA

(continued on next page)

Table 2 – (Continued)

Name of Journal	Impact Factor, 2009	Journal Rank, 2009*	Impact Factor, 2008	JCR Edition†			Other Impact Factor Subject Category Listing‡	Country§
				Science	Social Science	Both		
<i>Nursing Research</i>	1.798	6	1.538			✓		USA
<i>Nursing Science Quarterly</i>	1.215	16	1.265			✓		USA
<i>Oncology Nursing Forum</i>	1.907	4	2.207			✓	Oncology ¹	USA
<i>Orthopaedic Nursing</i>	0.573	61	0.548			✓		USA
<i>Pain Management Nursing</i>	1.306	14	1.537			✓		USA
<i>Perspectives in Psychiatric Care</i>	1.000	30	1.103			✓	Psychiatry ^{1,2}	USA
<i>Public Health Nursing</i>	0.813	46	0.519			✓	Public Health ^{1,2}	USA
<i>Rehabilitation Nursing</i>	0.667	57	0.767			✓	Rehabilitation ^{1,2}	USA
<i>Research in Nursing & Health</i>	1.514	11	1.457			✓		USA
<i>Revista de Escola de Enfermagem da USP</i>	0.386	68				✓		Brazil
<i>Revista Latino-Americana de Enfermagem</i>	0.608	59				✓		Brazil
<i>Scandinavian Journal of Caring Sciences</i>	0.686	–	0.773		✓			England
<i>Western Journal of Nursing Research</i>	1.090	23	0.989			✓		USA
<i>Worldviews on Evidence-Based Nursing</i>	1.944	1	1.294			✓		England

Journal Citation Reports, information retrieved June 18, 2010.

* Rankings are shown for the journals in the nursing subject category for the Science edition of *Journal Citation Reports* (N = 72). Rankings are slightly different in the Social Science edition. Journal rankings for the two journals that were listed only in the Social Science edition (*Nursing History Review*, *Scandinavian Journal of the Caring Sciences*) are not shown in the table.

† Nursing journals are listed in the Science Edition of JCR, in the Social Science edition, or in both.

‡ Journals with an entry in this column are indexed and rank-ordered in both the Nursing subject category and in another subject category of *Journal Citation Reports*. Those marked with a superscript 1 are subject categories in the Science edition; those marked with a 2 are subject categories in the Social Science edition.

§ All journals in the Nursing subject category are English-language journals except *Assistenza Infermieristica e Ricerca* (Italian) and *Revista de Escola de Enfermagem da USP* (Portuguese).

IFs are correlated with journal acceptance rates. Unfortunately, there is limited published information about acceptance rates in nursing journals, and existing information is fairly old.²⁸ Nevertheless, because of the historical nature of the five-year IF, an exploratory analysis was undertaken in which five-year IFs were correlated with acceptance rate data from a survey of nursing editors published in 2000.²⁸ According to the survey, percentages of submitted manuscripts accepted for publication ranged from 20% or lower (eg, *Nursing Research*) to 90% or higher (eg, *Journal of Neuroscience Nursing*). A total of 17 journals with five-year IF information in 2009 were represented in the 2000 journal editor survey. For these 17 journals, the correlation between acceptance rate and the five-year IF was significant ($r = -.61, P = .009$). In other words, journals with high IFs tended to be ones that accepted a lower percentage of submitted manuscripts, consistent with previous claims that IFs and acceptance rates are correlated.^{20,29}

Table 3 presents additional data about nursing journals available through JCR. For each journal, the table shows the number of citable articles and citable reviews in 2009. In JCR, an article qualifies as a review if it cites more than 100 references, if it is published in a review journal or a review section, if the word *review* is in its title, or if the abstract states that it is a review.¹ As this table shows, some journals with very high IFs, such as *Worldviews*, had a high percentage of reviews

among its citable items (21%), consistent with previous research, which has found that reviews attract more citations than other articles.¹⁴ However, the actual correlation between journal IF and the journal's percentage of citable articles that were reviews was modest ($r = .22$). This low correlation reflects the fact that several nursing journals with high IFs published no reviews in 2009 (eg, *Research in Nursing & Health*, *Nursing Outlook*), whereas several with relatively low IF rankings had more than 10% of their citable items as reviews (eg, *Journal of Addictions Nursing*, *International Nursing Review*). Thus, increasing the number of reviews is not a straightforward path to achieving higher IF scores.

Table 3 also presents information about the percentage of items that were citable in each journal in 2009. These percentages were calculated by dividing the number of citable items (articles plus reviews) by the number of citable and noncitable items for each journal. For example, in 2009 *Journal of Obstetric, Gynecologic, & Neonatal Nursing* (JOGNN) had 72 citable items and 24 noncitable items. (In most issues, JOGNN publishes editorials, a “thoughts and opinions” section, and special reports on resources for evidence-based practice.) Thus, the percentage citable for JOGNN was 72 divided by 96, times 100, which equals 75%. Journals that had high percentages of citable items, such as *Journal of Advanced Nursing* (90%) are primarily empirical and academically oriented, whereas journals that

Table 3 – Citable Items and References Information in 2009 for 73 Journals* in the Nursing Subject Categories, Journal Citation Reports (JCR)

Name of Journal	Issues Per Year	No. Of Citable Items [†]		% Of All Items That Were Citable [†]	Mean No. Of Refs/Citable Articles
		Articles	Reviews		
<i>Advances in Nursing Science</i>	4	23	2	81	42.6
<i>American Journal of Critical Care</i>	6	58	4	60	31.0
<i>American Journal of Nursing</i>	12	42	0	16	19.1
<i>Applied Nursing Research</i>	4	37	0	84	27.5
<i>Archives of Psychiatric Nursing</i>	6	41	1	74	35.8
<i>Assistenza Infermieristica e Ricerca</i>	4	16	0	52	22.9
<i>Australian Journal of Advanced Nursing</i>	4	46	0	90	27.4
<i>Australian Journal of Rural Health</i>	6	50	1	65	20.9
<i>Bariatric Nursing & Surgical Patient Care</i>	4	25	0	36	22.4
<i>Biological Research for Nursing</i>	4	35	4	91	54.1
<i>Birth: Issues in Perinatal Care</i>	4	42	2	72	25.1
<i>Cancer Nursing</i>	6	52	0	85	42.4
<i>CIN: Computers, Informatics, Nursing</i>	6	35	0	81	29.5
<i>Clinical Nurse Specialist</i>	6	28	2	22	37.9
<i>Contemporary Nurse</i>	8	44	1	75	39.9
<i>Critical Care Nurse</i>	6	34	1	22	30.4
<i>European Journal of Oncology Nursing</i>	5	43	6	68	42.6
<i>Gastroenterology Nursing</i>	6	32	0	57	25.3
<i>Geriatric Nursing</i>	6	24	2	43	39.7
<i>Heart & Lung</i>	5	51	1	90	33.9
<i>International Journal of Nursing Studies</i>	12	129	29	87	47.2
<i>International Journal of Urological Nursing</i>	3	20	0	57	24.5
<i>International Nursing Review</i>	4	57	9	60	29.6
<i>Japanese Journal of Nursing Science</i>	2	13	0	76	26.5
<i>Journal of Addictions Nursing</i>	4	14	3	57	40.4
<i>Journal of Advanced Nursing</i>	12	215	36	90	42.1
<i>J. Am. Academy of Nurse Practitioners</i>	12	84	9	98	36.7
<i>J. of the Assoc. of Nurses in AIDS Care</i>	6	40	2	71	32.6
<i>Journal of Cardiovascular Nursing</i>	6	49	2	63	39.2
<i>Journal of Clinical Nursing</i>	24	325	36	80	40.0
<i>Journal of Community Health Nursing</i>	4	19	0	95	28.8
<i>Journal of Emergency Nursing</i>	6	91	0	54	12.5
<i>Journal of Family Nursing</i>	4	22	0	79	44.1
<i>Journal of Gerontologic Nursing</i>	12	61	2	69	30.2
<i>Journal of Human Lactation</i>	4	40	2	66	31.2
<i>Journal of Midwifery & Women's Health</i>	6	55	6	62	32.0
<i>Journal of Nursing Administration</i>	11	75	2	68	18.6
<i>Journal of Nursing Care Quality</i>	4	40	1	76	21.6
<i>Journal of Nursing Education</i>	12	108	1	88	24.2
<i>Journal of Nursing Scholarship</i>	4	49	0	79	30.7
<i>J. of Obstetric, Gyn., & Neonatal Nursing</i>	6	64	8	75	40.2
<i>Journal of Pediatric Oncology Nursing</i>	6	31	3	92	36.9
<i>Journal of Perinatal & Neonatal Nursing</i>	4	32	2	56	32.6
<i>Journal of Professional Nursing</i>	6	39	0	83	29.8
<i>J. of Psychiatric & Mental Health Nursing</i>	6	101	6	66	35.9
<i>J. of Psychosocial Nurs & Ment Hlth Serv</i>	12	66	0	40	15.9
<i>J. for Specialists in Pediatric Nursing</i>	4	34	2	84	34.9
<i>Journal of Transcultural Nursing</i>	4	36	0	86	42.2
<i>J. of Wound, Ostomy & Continence Nurs</i>	6	60	5	22	24.1
<i>MCN: Amer. J. Maternal/Child Nursing</i>	6	42	0	52	24.0
<i>Midwifery</i>	4	73	1	76	34.4
<i>Nursing & Health Sciences</i>	4	59	5	96	31.2
<i>Nursing Clinics of North America</i>	4	46	0	92	30.3
<i>Nursing Economics</i>	6	46	0	68	23.5
<i>Nurse Educator</i>	6	43	1	57	15.9
<i>Nursing Education Today</i>	8	120	4	89	31.1
<i>Nursing Ethics</i>	6	57	1	54	37.9
<i>Nursing Inquiry</i>	4	33	1	89	43.1
<i>Nursing Outlook</i>	6	31	0	57	31.5

(continued on next page)

Table 3 – (Continued)

Name of Journal	Issues Per Year	No. Of Citable Items [†]		% Of All Items That Were Citable [†]	Mean No. Of Refs/Citable Articles
		Articles	Reviews		
<i>Nursing Research</i>	6	50	1	88	38.3
<i>Nursing Science Quarterly</i>	4	42	1	51	20.5
<i>Oncology Nursing Forum</i>	6	61	0	49	33.1
<i>Orthopaedic Nursing</i>	6	41	2	74	19.1
<i>Pain Management Nursing</i>	6	20	0	83	32.2
<i>Perspectives in Psychiatric Care</i>	4	29	0	81	30.8
<i>Public Health Nursing</i>	6	60	0	86	33.2
<i>Rehabilitation Nursing</i>	6	32	0	76	24.7
<i>Research in Nursing & Health</i>	6	53	0	88	50.9
<i>Revista de Escola de Enfermagem da USP</i>	4	133	2	96	18.5
<i>Revista Latino-Americana de Enfermagem</i>	6	132	10	95	16.5
<i>Scandinavian Journal of Caring Sciences</i>	12	87	2	96	40.6
<i>Western Journal of Nursing Research</i>	8	55	1	74	40.8
<i>Worldviews on Evidence-Based Nursing</i>	4	19	5	77	36.2

Journal Citation Reports, from tables specific to each journal labeled “Journal Source Information”; information retrieved July 16, 2010.

* Information for this table was not available for *Nursing History Review*.

† See text for a definition of a citable item.

are more clinically or practice oriented tended to have lower percentages (eg, *Clinical Nurse Specialist*, 22% citable items).

Table 3 also shows that journals varied widely in terms of their mean number of references in their citable articles. In 2009, the mean ranged from a low of 12.5 (*Journal of Emergency Nursing*) to a high of 54.1 (*Biological Research for Nursing*). These averages could be affected by many things, such as journal policies and the number of reviews published. For example, 10% of the citable articles in *Biological Research for Nursing* were classified as reviews, which tend to have long bibliographies. Within nursing, the mean number of citations in a journal had a modest, positive correlation with the journal’s 2009 IF ($r = .41, P < .001$).

Impact Factors in Nursing and Other Subject Categories

Nurse leaders and editors have expressed concerns that nursing would be treated unfairly by users of IF information^{2,15} because IFs in the Nursing subject category tend to be lower than in many other categories, particularly in medical categories. It is true that top-tier medical journals have extremely high IFs. For example, the 2009 IF for the *New England Journal of Medicine* was 47.0.¹ Several critics of the IF system have warned of the dangers of cross-subject comparisons.^{4,6,20,22} Such comparisons are particularly problematic when they are used to justify institutional or government decisions about resource allocation to different academic departments. As noted by Courtney and Jones,⁹ however, the median IF for subject categories does not put Nursing at a sharp disadvantage.

Like Nursing, many subject categories have median IFs lower than 2.0. For example, the subject category of General and Internal Medicine, which indexed 132 journals in 2009, had a median IF in that year of 1.29, and Otorhinolaryngology (36 journals) had an IF of 1.16.

Perhaps of greatest relevance are subject categories with which Nursing journals are cross-classified. As shown in Table 4, several subject categories in the JCR Science edition had 2009 median IFs that were near to the median for Nursing—for example, Emergency Medicine (0.92) and Pediatrics (1.41). In the Social Science edition, all of the cross-classified subject categories had median 2009 IFs lower than 2.00, including Family Studies (1.21), Gerontology (1.03), and Rehabilitation (1.04).

In terms of absolute numbers of citations, Table 4 shows that citations to articles in Nursing journals in 2009 were relatively low compared with those for other subject categories. For example, the number of citations to articles in Pediatric journals (297,188) was about five times greater than those to articles in Nursing (59,362), even though Pediatrics had only 22 (31%) more journals. Recent bibliometric analyses have found that nurse authors are far more likely to cite articles in medical journals than vice versa,^{30,31} which could contribute to this imbalance.

Discussion

Within the context of the current environment, nurse authors and nurse editors appear to face dilemmas

Table 4 – Median 2009 Impact Factors For Journals in Select Subject Categories*

JCR Edition	Subject Category	No. Of Journals in Category	Total No. Of Citations	Median Impact Factor, 2009
Science	Nursing	72	59,362	0.909
	Cardiac/Cardiovascular	95	577,931	1.949
	Critical care medicine	22	151,900	2.380
	Emergency medicine	19	37,376	0.916
	Gastroenterology/Hepatology	65	367,271	2.092
	Geriatrics/Gerontology	40	95,458	1.813
	Health care science/services	69	118,938	1.583
	Obstetrics/Gynecology	70	244,056	1.658
	Oncology	165	1,079,109	2.412
	Pediatrics	94	297,188	1.406
	Psychiatry	117	502,613	2.197
	Public, environmental, occupational health	122	400,681	1.633
	Rehabilitation	33	57,959	1.367
	Substance abuse	11	50,287	2.289
	Social science	Nursing	70	56,652
Family studies		32	36,398	1.208
Gerontology		25	60,117	1.032
Health policy and services		49	75,954	1.448
History of social sciences		22	6,209	0.472
Psychiatry		94	327,974	1.539
Public, environmental, occupational health		95	170,410	1.328
Rehabilitation		52	41,365	1.038
Substance abuse		22	40,442	1.240

* Subject categories shown are ones in which nursing journals are cross-classified (see Table 1). Data were obtained from *Journal Citation Reports*, downloaded September 10, 2010.

with regard to IFs, and may feel pulled in different directions. Many journal editors, for example, have published editorials expressing unease about “impact fever.”^{7,9,12,15,16} Editors, like authors, are under pressure to perform, and expectations to achieve higher IF scores might not always be met with enthusiasm.¹⁸ On the other hand, nurse editors have lobbied hard to have nursing journals recognized by ISI.⁸ Table 1 demonstrates that the list of indexed nursing journals has expanded markedly, but it seems likely that nurse editors will persist in advocating for greater coverage of nursing journals and will continue to formally apply to ISI to have their journals evaluated for inclusion.¹⁰

Nurse authors also struggle with the IF issue in terms of decisions about where to submit their manuscripts. They may be torn by the aspiration (or, even, the requirement) to publish in high-impact journals on the one hand and the desire to publish in journals read by an appropriate clinical audience on the other. Because of keen competition in high-impact journals, those whose decisions about journal submission are driven primarily by journal IFs may face lengthy and frustrating journeys through several submissions, as revealed in a case report by one team of authors.³² Studies have found that most papers that are rejected by high IF journals are subsequently published, typically in journals with a lower IF,^{33,34} but protracted publication efforts may serve neither the

needs of the authors nor the end users of the information. Consideration of a journal’s IF is likely to continue to be a factor in some authors’ decisions to target one journal over another, but should be only one part of the publishing plan. Careful selection to match a manuscript to a journal’s focus and target audience remains paramount. In the current climate, nurse authors may perhaps do well to adopt a strategy of having a diversified portfolio of publications, with articles aimed at a range of academic and clinical audiences.

Impact factors have sparked considerable controversy, and controversy can be healthy if it stimulates positive change. Discussions about issues that can affect scholarly endeavor and productivity are clearly important. Critics and commentators have already influenced the type of information that is available in JCR, and well-armed critics could perhaps affect institutional or other policies as well. Some of the criticisms expressed in the literature, however, do not appear to be well founded, and it is hoped that some of the information in this article will help to provide some facts about the IF for nurses, so that constructive efforts to improve the current situation are not based primarily on speculation, anecdotes, and simple reiteration of earlier criticisms.

“Facts” usually develop within the context of scholarly inquiry, and thus far, actual research about

IFs, especially about IFs in nursing, is remarkably sparse,¹⁰ except for bibliometric analyses.³⁵ For example, those who reject the notion that IFs are related to journal or article quality might test this hypothesis in systematic studies. In medicine, there is some evidence that the rating of journal quality by researchers and clinicians is correlated with IFs.³⁶ There is also some evidence that IF scores in medical journals are strongly predictive of ratings of the methodologic quality of clinical research articles, with reviewers blinded to journal quality characteristics.³⁷

Research examining the relevance of such findings to nursing is limited, but a few studies do suggest a link between research quality and IF scores. In one study of 619 cancer nursing research articles published between 1994 and 2003, researchers found that articles in journals with an IF rating had a higher quality score than those in nonindexed journals.³⁸ Two studies of randomized controlled trials (RCTs) in nursing suggest that the use of high-quality methodological and reporting features is more prevalent in articles appearing in high-impact journals.^{39,40} For example, in a study that examined the reporting quality for 95 reports of RCTs published in four nursing journals, the journals' mean quality score was rank ordered in exactly the same order as the journals' IF (ie, *Nursing Research* having the highest quality score and IF, *Journal of Clinical Nursing* having the lowest score and IF of the four journals).⁴⁰

The recent case study by Ketefian and colleagues¹¹ represents an important starting point for investigating how IFs affect nurses' publication decisions and scholarly pursuits. In their case study of the effect of IF policies on nurse researchers in five countries, Ketefian et al found that respondents in non-English-speaking countries expressed concern about language hurdles imposed by government requirements to publish in high IF journals (although they also felt that IF policies had resulted in improved methodologic rigor). With only five respondents per country, however, there is ample room for greater scrutiny of this issue.

In summary, it may become increasingly important for nurses, whose commitment to transmitting useful information to practicing nurses should be encouraged, to play a more active role in furthering the debate about IFs in a constructive fashion. To accomplish this, they should be armed with research-based evidence about IFs and possible alternative ways of assessing the quality and impact of their scholarly contributions. There is also a need for research on methods of documenting, and perhaps quantifying, the contributions that nursing studies make in such arenas as nursing practice and health policy.⁴¹ Further study is also needed regarding why nurse authors cite medical journals more often than nursing journals, a tendency that simultaneously inflates the IFs of medical journals and deflates the IFs of nursing journals.

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