

Academic impact of Chinese medical journals in the Web of Science, 2009–2012

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An objective and multi-perspective evaluation of academic impact might provide a more complete understanding of the recent evolution of Chinese medical journals. In this study, we aimed to evaluate the academic impact of these journals using citation data from the *JCR* database. We collected data on Chinese medical journals for the analysis, including journal title, ISSN, language, publisher, frequency, impact factor, median impact factor (category), citable items, total cites, self cites, immediacy index, and aggregate immediacy index (category). We found most indicators of the Chinese medical journals were in middle–low position or low position. This indicated that the quality and impact of these journals was comparatively low. Based on the above finding, efforts need to be made to improve the quality and impact of Chinese medical journals.

Keywords: Academic impact, Chinese medical journals; impact factor, Web of Science.

SCHOLARLY journals, as updated sources of knowledge, have a significant role in scientific communication. They are important for improving research in different fields of science. With the development of bibliometrics in recent years, the scientific impact of a scholarly journal is often evaluated by different information databases. One of the most important international databases is the ISI Web of Knowledge, which annually publishes *Journal Citation Reports (JCR)*. *JCR*, which includes impact factor (IF), is a comprehensive and unique resource that allows one to evaluate and compare journals using citation data drawn from over 11,000 scholarly and technical journals from more than 3300 publishers worldwide in over 230 disciplines. Citation and article counts are important indicators of how frequently current researchers are using individual journals. By tabulating and aggregating citation and article counts, *JCR* offers a unique perspective for journal evaluation and comparison. *JCR* has been recognized as an authority for evaluating journals.

Medical journals serve as one of the most effective tools of disseminating medical knowledge. Currently, there are a total of about 1000 medical journals in China (mainland China), accounting for 20% of S&T journals¹.

They are usually published by the Chinese Medical Association, Chinese Academy of Medical Sciences, Chinese Academy of Traditional Chinese Medicine, publishing houses, universities or academic institutions. Helped by reforms and openness, more Chinese medical journals have been covered by major international indexing and abstracting information agencies and services. However, there are only few studies in the literature for assessing the academic impact of Chinese medical journals². An objective and multi-perspective evaluation of academic impact might provide a more complete understanding of the recent evolution of Chinese medical journals. Therefore, in this study we aimed to evaluate the academic impact of Chinese medical journals using citation data from the *JCR* database.

All data were collected from the 2009 to 2012 *JCR* databases. The Chinese medical journals enrolled in this study fulfil the following criteria: (i) the journals were listed in the category of *Science Citation Index-Expanded (SCI-E)* subject categories by the Institute for Scientific Information (ISI); (ii) they were listed in the *JCR* Science Edition and have IF; (iii) they were listed under 'PEOPLES R CHINA' for countries/territories; (iv) they were listed under 'medicine' with subject categories like, 'emergency medicine', 'neuroscience', 'pediatrics' and (v) journals from Hong Kong were excluded.

We collected data on Chinese medical journals including journal title, International Standard Serial Number (ISSN), language, publisher, frequency, IF, median IF (category), citable items, total cites, self cites, immediacy index (II) and aggregate II (category).

There were a total of 14, 17, 20 and 21 journals enrolled in the 2009, 2010, 2011 and 2012 *JCR* databases respectively, based on the inclusion criteria. Table 1 shows that the number of Chinese medical journals in the *JCR* Science Edition increased from 2009 to 2012 (AII) (10–15%).

From Table 2, we can see that one journal (*WJG*) is published weekly, one journal (*NRR*) semi-monthly, six journals monthly, four journals bimonthly and nine journals quarterly. All journals are published in English. Most journals are published by publishing houses, especially by global publishing companies; few journals are published by universities or associations.

The IF of 21 Chinese medical journals in 2009–2012 *JCR* databases is listed in Table 3. Among these, the IF of 12 journals increased from 2009 to 2012. Only one journal had IF > 4, five journals IF > 2, six journals IF > 1 and the remaining nine journals had IF < 1. In 2012, the IF of only six journals was higher than that of median impact factor (category).

Quartile rankings (QR) were derived for each journal in each of its subject categories according to the quartile of the IF distribution the journal occupies for that subject category³. Q1 denotes the top 25% of the IF distribution, Q2 the middle–high position (between top 50% and top 25%), Q3 middle–low position (top 75% to top 50%), and

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Table 1. Number of Chinese medical journals in *JCR* Science Edition

Variables	2009	2010	2011	2012
Number of all journals in <i>JCR</i> Science Edition	7387	8073	8336	8471
Number of journals from China in <i>JCR</i> Science Edition	139	169	187	185
Number of Chinese medical journals in <i>JCR</i> Science Edition	14	17	20	21
Per cent	10.0	10.0	10.7	11.4

Per cent = Number of Chinese medical journals in *JCR* Science Edition/Number of journals from China in *JCR* Science Edition.

Table 2. Information about the 21 journals listed in 2012 *JCR* Science Edition

Journal	ISSN	Language	Publisher	Frequency	Subject category	Impact factor
<i>CNS Neurosci. Ther.</i> (<i>CNSNT</i>)	1755-5930	English	Wiley-Blackwell	12	Neuroscience	4.458
<i>J. Diabetes (JD)</i>	1753-0393	English	Wiley-Blackwell	4	Endocrinology and Metabolism	2.939
<i>Int. J. Oral Sci. (IJOS)</i>	1674-2818	English	Nature Publishing Group	4	Dentistry, Oral Surgery and Medicine	2.719
<i>World J. Gastroentero.</i> (<i>WJG</i>)	1007-9327	English	Baishideng Publishing Group Co Ltd	48	Gastroenterology and Hepatology	2.547
<i>Asian J. Androl. (AJA)</i>	1008-682X	English	Acta Pharmacologica Sinica	6	Urology and Nephrology	2.140
<i>J. Genet. Genomics</i> (<i>JGG</i>)	1673-8527	English	Science Press	12	Genetics and Heredity	2.076
<i>J. Dig. Dis. (JDD)</i>	1751-2972	English	Wiley-Blackwell	4	Gastroenterology and Hepatology	1.853
<i>Neurosci. Bull. (NB)</i>	1673-7067	English	Springer	6	Neuroscience	1.365
<i>Hepatob. Pancreatic.</i> <i>Dis. Int. (HPDI)</i>	1499-3872	English	Zhejiang University School of Medicine	6	Gastroenterology and Hepatology	1.259
<i>J. Zhejiang. Univ.-</i> <i>Sci. B (JZUSB)</i>	1673-1581	English	Zhejiang University	12	Medicine, Research and Experimental	1.108
<i>World J. Pediatr.</i> (<i>WJP</i>)	1708-8569	English	Zhejiang University School of Medicine	4	Pediatrics	1.084
<i>Chin. J. Integr. Med.</i> (<i>CJIM</i>)	1672-0415	English	Springer	12	Integrative and Complementary Medicine	1.059
<i>Chin. Med. J. (CMJ)</i>	0366-6999	English	Chinese Medical Association	12	Medicine, General and Internal	0.901
<i>Thorac. Cancer (TC)</i>	1759-7706	English	Wiley-Blackwell	4	Oncology	0.650
<i>J. Tradit. Chin. Med.</i> (<i>TJCM</i>)	0255-2922	English	Journal of Traditional Chinese Medicine	4	Integrative and Complementary Medicine	0.589
<i>Asian J. Surg. (AJS)</i>	1015-9584	English	Elsevier Singapore Pte Ltd	4	Surgery	0.543
<i>Asian Pac. J. Trop.</i> <i>Med. (APJTM)</i>	1995-7645	English	Elsevier Science Ltd	12	Public, Environmental and Occupational Health	0.502
<i>Chin. J. Cancer Res.</i> (<i>CJCR</i>)	1000-9604	English	Springer	4	Oncology	0.448
<i>Neural Regen. Res.</i> (<i>NRQ</i>)	1673-5374	English	Shenyang Editorial Department Neural Regeneration Research	24	Neurosciences	0.144
<i>Int. J. Ophthalmol.</i> (<i>IJO</i>)	2222-3959	English	IJO Press	6	Ophthalmology	0.119
<i>Surg. Pract. (SP)</i>	1744-1625	English	Wiley-Blackwell	4	Surgery	0.111

Q4 the lowest position (bottom 25% of the IF distribution). In terms of QR, most Chinese medical journals were in Q3 or Q4, while few journals were in Q1 or Q2.

In general, total cites (TC) will increase according to the number of citable items. Among the 21 journals, the number of citable items did not change significantly during 2009–2012, and most journals presented a trend of increase each year (Table 4). *WJG* published the most papers, followed by *CMJ*.

TC indicate the total number of times that each journal has been cited by all journals included in the database within the current *JCR* year³. Table 5 lists TC and self cites of each journal in the 2009–2012 *JCR* databases. We can see that TC of *WJG* (TC > 12,000) and *CMJ* (TC > 3000) are higher than those of other journals. As for the journal rank in categories according to TC, most journals were in the middle–low position, and few were in top position. The percentage of self cites was

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Table 3. Impact factor of Chinese medical journals listed in 2009–2012 *JCR* databases

Journal	2009			2010			2011			2012		
	IF	MIF	QR	IF	MIF	QR	IF	MIF	QR	IF	MIF	QR
<i>CNSNT</i>	2.690	2.766	Q3	3.492	2.783	Q2	4.443	2.748	Q1	4.458	2.872	Q1
<i>JD</i>	–	–	–	–	–	–	–	–	–	2.939	2.659	Q2
<i>IJOS</i>	–	–	–	0.815	1.345	Q4	1.411	1.204	Q2	2.719	1.238	Q1
<i>WJG</i>	2.092	2.097	Q3	2.240	2.210	Q2	2.471	2.379	Q2	2.547	2.229	Q2
<i>AJA</i>	1.688	1.949	Q3	1.549	1.843	Q3	1.521	1.827	Q3	2.140	1.964	Q2
<i>JGG</i>	0.813	2.566	Q4	1.494	2.488	Q4	1.883	2.524	Q3	2.076	2.570	Q3
<i>JDD</i>	1.791	2.097	Q3	1.870	2.210	Q3	1.589	2.379	Q3	1.853	2.229	Q3
<i>NB</i>	–	–	–	–	–	–	1.311	2.748	Q4	1.365	2.872	Q4
<i>HPDI</i>	1.183	2.097	Q4	1.514	2.210	Q3	1.082	2.379	Q4	1.259	2.229	Q4
<i>JZUSB</i>	1.041	1.886	Q3	1.027	1.874	Q3	1.099	2.228	Q4	1.108	2.263	Q4
<i>WJP</i>	0.365	1.403	Q4	0.945	1.314	Q3	1.216	1.450	Q3	1.084	1.382	Q3
<i>CJIM</i>	0.420	1.125	Q4	0.578	1.825	Q4	0.799	1.329	Q4	1.059	1.183	Q3
<i>CMJ</i>	0.952	1.275	Q3	0.983	1.104	Q3	0.864	1.132	Q3	0.901	1.078	Q3
<i>TC</i>	–	–	–	–	–	–	0.593	2.534	Q4	0.650	2.610	Q4
<i>JTCM</i>	–	–	–	–	–	–	0.296	1.329	Q4	0.589	1.183	Q3
<i>AJS</i>	0.524	1.293	Q4	0.652	1.263	Q4	0.575	1.369	Q4	0.543	1.436	Q4
<i>APJTM</i>	–	–	–	0.172	1.516	Q4	0.371	1.527	Q4	0.502	1.555	Q4
<i>CJCR</i>	0.198	2.429	Q4	0.252	2.455	Q4	0.182	2.534	Q4	0.448	2.610	Q4
<i>NRR</i>	–	–	–	0.180	2.783	Q4	0.216	2.748	Q4	0.144	2.872	Q4
<i>IJO</i>	–	–	–	0.000	1.362	Q4	0.040	1.462	Q4	0.119	1.500	Q4
<i>SP</i>	0.132	1.293	Q4	0.094	1.263	Q4	0.149	1.369	Q4	0.111	1.436	Q4

MIF, Median impact factor (category); QR, Quartile rankings.

Table 4. Citable items of the Chinese medical journals listed in 2009–2012 *JCR* databases

Journal	Citable items			
	2009	2010	2011	2012
<i>CNSNT</i>	32	47	73	126
<i>JD</i>	–	–	–	47
<i>IJOS</i>	–	29	28	41
<i>WJG</i>	863	813	677	944
<i>AJA</i>	90	98	124	123
<i>JGG</i>	77	77	67	64
<i>JDD</i>	52	55	74	98
<i>NB</i>	–	–	46	79
<i>HPDI</i>	107	101	96	90
<i>JZUSB</i>	128	124	126	116
<i>WJP</i>	55	56	63	62
<i>CJIM</i>	77	82	138	131
<i>CMJ</i>	570	689	779	799
<i>TC</i>	–	–	33	54
<i>JTCM</i>	–	–	75	114
<i>AJS</i>	44	36	26	32
<i>APJTM</i>	–	278	210	198
<i>CJCR</i>	50	49	56	61
<i>NRR</i>	–	320	405	403
<i>IJO</i>	–	68	143	145
<i>SP</i>	32	35	28	36

comparatively low, except *APJTM* with 73 in 2010 and *NRR* 63 in 2011.

II is the average number of times an article is cited in the year it is published³. The journal II indicates how

quickly articles in a journal are cited. The AII indicates how quickly articles in a subject category are cited. Table 6 shows the II and AII of journals in 2009–2012 *JCR* databases. The II of most journals was lower than 1. Except *AJG*, the value of II was lower than that of AII for each journal.

According to IF in the 2012 *JCR*, the first three medical journals were *A Cancer Journal for Clinicians*, *New England Journal of Medicine* and *Lancet*. Table 7 shows the bibliometric indicators of these three journals and the first 10 Chinese medical journals. Chinese medical journals lag behind in terms of TC, IF and II.

Various tools for assessing journal quality and impact have been proposed, and the most common one is probably the journal IF^{4,5}. The IF of an academic journal is a measure reflecting the average number of citations to recent articles published in the journal. Initially the IF was used to judge the academic ranking of a journal to assist libraries in managing the selection of serials. Currently, the IF is frequently used as an important indicator for the relative importance of a journal within its field; journals with higher IF are considered to be more important than those with lower values⁶. However, several scholars have pointed out the inefficiencies of the IF^{7,8}. Therefore, in recent years, besides the traditional IF, a number of other bibliometric indices have been designed to assess the impact of scientific journals. Like in *JCR*, bibliometric indices such as journal IF, 5-year journal IF, journal self cites, journal II and journal cited half-life, are used to evaluate journals based on citation data. *JCR* has

Table 5. Citations of Chinese medical journals listed in 2009–2012 *JCR* databases

Journal	2009			2010			2011			2012		
	TC	JR	SC (%)	TC	JR	SC (%)	TC	JR	SC (%)	TC	JR	SC (%)
<i>CNSNT</i>	91	225/231	3 (3)	243	210/239	8 (3)	540	198/244	27 (5)	869	186/252	81 (9)
<i>JD</i>	–	–	–	–	–	–	–	–	–	287	103/122	11 (3)
<i>IJOS</i>	–	–	–	23	75/77	1 (4)	84	78/81	0 (0)	245	74/83	5 (2)
<i>WJG</i>	12,740	8/66	767 (6)	15,119	7/72	832 (5)	16,951	7/74	758 (4)	19,145	6/74	998 (5)
<i>AJA</i>	1051	37/63	98 (9)	1194	34/69	123 (10)	1413	33/73	186 (13)	1739	31/73	182 (10)
<i>JGG</i>	195	133/146	10 (5)	414	131/156	11 (2)	615	125/158	12 (1)	860	119/161	46 (5)
<i>JDD</i>	131	60/66	5 (3)	265	62/72	16 (6)	327	64/74	16 (6)	494	61/74	17 (3)
<i>NB</i>	–	–	–	–	–	–	292	213/244	6 (2)	370	215/252	31 (8)
<i>HPDI</i>	845	48/66	57 (6)	1020	48/72	66 (6)	965	51/74	47 (4)	1219	51/74	30 (2)
<i>JZUSB</i>	619	106/152	52 (8)	770	105/160	42 (5)	946	64/112	49 (5)	1150	68/121	91 (7)
<i>WJP</i>	56	90/94	9 (16)	125	101/109	11 (8)	213	103/115	16 (7)	298	105/122	10 (3)
<i>CJIM</i>	100	15/17	8 (8)	182	18/21	36 (19)	318	16/22	112 (35)	514	12/22	50 (9)
<i>CMJ</i>	3407	28/133	526 (15)	3900	26/153	532 (13)	4447	22/155	588 (13)	5269	20/155	706 (13)
<i>TC</i>	–	–	–	–	–	–	18	193/196	3 (16)	45	196/197	19 (42)
<i>JTCM</i>	–	–	–	–	–	–	398	12/22	13 (3)	484	14/22	38 (7)
<i>AJS</i>	305	145/167	8 (2)	340	159/188	0 (0)	354	166/199	3 (0)	375	168/199	0 (0)
<i>APJTM</i>	–	–	–	42	139/142	31 (73)	167	140/158	80 (47)	269	138/161	20 (7)
<i>CJCR</i>	40	162/166	5 (12)	64	178/185	5 (7)	65	188/196	5 (7)	110	187/197	12 (10)
<i>NRR</i>	–	–	–	109	224/239	49 (44)	154	229/244	98 (63)	147	237/252	35 (23)
<i>IJO</i>	–	–	–	1	56/56	0 (0)	9	58/58	0 (0)	41	58/59	19 (46)
<i>SP</i>	19	165/167	1 (5)	32	183/188	8 (25)	33	195/199	10 (30)	25	198/199	4 (16)

TC, Total cites; JR, Journal rank in categories according to TC; SC, Self cites.

Table 6. Immediacy index of Chinese medical journals listed in 2009–2012 *JCR* databases

Journal	2009		2010		2011		2012	
	II	AII	II	AII	II	AII	II	AII
<i>CNSNT</i>	0.406	0.720	0.617	0.723	0.562	0.780	0.540	0.812
<i>JD</i>	–	–	–	–	–	–	0.340	0.840
<i>IJOS</i>	–	–	0.034	0.243	0.143	0.261	0.073	0.275
<i>WJG</i>	0.254	0.745	0.325	0.778	0.297	0.826	0.218	0.866
<i>AJA</i>	0.378	0.642	0.765	0.605	0.685	0.615	0.748	0.662
<i>JGG</i>	0.195	0.874	0.169	0.847	0.239	0.868	0.359	0.855
<i>JDD</i>	0.154	0.745	0.236	0.778	0.176	0.826	0.276	0.866
<i>NB</i>	–	–	–	–	0.087	0.780	0.266	0.812
<i>HPDI</i>	0.121	0.745	0.139	0.778	0.104	0.826	0.100	0.866
<i>JZUSB</i>	0.156	0.520	0.137	0.530	0.135	0.690	0.190	0.674
<i>WJP</i>	0.236	0.344	0.143	0.360	0.190	0.396	0.145	0.396
<i>CJIM</i>	0.039	0.252	0.183	0.286	0.326	0.291	0.168	0.350
<i>CMJ</i>	0.161	1.169	0.700	0.980	0.083	0.991	0.113	1.092
<i>TC</i>	–	–	–	–	0.061	0.831	0.093	0.858
<i>JTCM</i>	–	–	–	–	0.013	0.291	0.053	0.350
<i>AJS</i>	0.114	0.343	0.028	0.339	0.038	0.357	0.031	0.390
<i>APJTM</i>	–	–	0.172	0.489	0.086	0.471	0.146	0.526
<i>CJCR</i>	0.000	0.870	0.000	0.858	0.089	0.831	0.049	0.858
<i>NRR</i>	–	–	0.009	0.723	0.025	0.780	0.022	0.812
<i>IJO</i>	–	–	0.000	0.376	0.014	0.449	0.048	0.444
<i>SP</i>	0.000	0.343	0.143	0.339	0.143	0.357	0.083	0.390

II, Immediacy index; AII, Aggregate immediacy index (category).

been recognized as the authority for evaluating journals. In this study, we selected some bibliometric indices from 2009 to 2012 *JCR* databases to evaluate the academic impact of Chinese medical journals. We found that these indices showed a trend of increase, but do

not change significantly; as for the journal ranking, most indicators of these journals were in middle–low position or low position. This indicates that the quality and impact of Chinese medical journals is comparatively low.

Table 7. Bibliometric indicators of the first three medical journals according to IF in 2012 *JCR* and the first ten Chinese medical journals

Journal	ISSN	Total cites	IF	Immediacy index	Citable items
<i>CA-Cancer J. Clin.</i>	0007-9235	13,722	153.459	27.040	25
<i>N. Engl. J. Med.</i>	0028-4793	245,605	51.658	12.667	360
<i>Lancet</i>	0140-6736	166,922	39.060	9.556	313
<i>CNSNT</i>	1755-5930	869	4.458	0.540	126
<i>JD</i>	1753-0393	287	2.939	0.340	47
<i>IJOS</i>	1674-2818	245	2.719	0.073	41
<i>WJG</i>	1007-9327	19,145	2.547	0.218	944
<i>AJA</i>	1008-682X	1739	2.140	0.748	123
<i>JGG</i>	1673-8527	860	2.076	0.359	64
<i>JDD</i>	1751-2972	494	1.853	0.276	98
<i>NB</i>	1673-7067	370	1.365	0.266	79
<i>HPDI</i>	1499-3872	1219	1.259	0.100	90
<i>JZUSB</i>	1673-1581	1150	1.108	0.190	116

Thus efforts are needed to improve the quality and impact of Chinese medical journals. First, the quality of journals must be improved. Journal editors should keep track of current topics of research actively solicit articles through attending important conferences, both national and international. Good manuscripts should be given preference while publishing⁹. Editors should strictly follow international practice with regard to editorial work. Besides, the government, universities and research institutions should improve the academic evaluation standards to prevent the outflow of papers (especially those reflecting outstanding achievements in scientific research) from China to foreign countries¹⁰.

Secondly, the visibility and citation of journals should be increased. Editorial departments should establish a website with functions for full-text retrieval, on-line reading and links to other resources, thus effectively disseminating information from the journals while increasing their visibility and impact. A journal website could also make a link with other journals in the same field, especially those covered by Web of Science. Editors should also identify major local and international indexing and abstracting services which appropriately cover the scope of their journals and send sample copies of their journals to them for evaluation in order to be covered. Lastly, there must be an increase in the internationalization of authors and editorial boards. Editors could invite foreign professionals to serve on the editorial and reviewing boards. This will encourage more foreign contributions, as it has been noted that the number of foreign contributions is related to higher percentage of foreign editorial board members¹¹.

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