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Improvement analysis of article quality in *World Journal of Gastroenterology* during 2008-2012

Yang H *et al.* Analysis of articles quality in *WJG*

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Abstract

BACKGROUND

AIM

To understand the changes and development of *World Journal of Gastroenterology (WJG)* in recent years.

METHODS

The Journal Citation Report (JCR) and SCI-E database of the ISI Web of Knowledge were used to search the articles and data of related indices in *WJG* during 2008–2012. Bibliometric methods were used for statistical analysis of the author's degree of collaboration, collaboration rate, the first author's publications, high-productivity authors, the authors origins in each year; the distribution of the countries and journals of the authors citing *WJG* papers was also analyzed. In addition, the indices related to this journal in each year were compared with the data from 6 SCI journals in the field of gastroenterology in the 2012 volume.

RESULTS

A total of 4409 papers in *WJG* were examined in this study. For the period 2008–2012, the self-citation rate was 8.59%, 6.02%, 5.50%, 4.47% and 5.21%. Of a total of 3898 first authors, 3526 published 1 paper, 291 published 2 papers, 59 published 3 papers, and 22 published 4 or more papers. The origin of *WJG* authors covered the six continents, and the majority came from Asia, Europe and North America. The number of countries of origin of *WJG* authors was 65, 66, 61, 65 and 60 for the period 2008–2012. Authors from 66 countries cited a total of 3194 of the 4409 papers, and these citations were found in 1140 journals.

CONCLUSION

The results suggest that *WJG* has stayed on the track of normal international publication and all the indices of this journal are stable and reasonable.

Key words: Author analysis; Bibliometrics; *World Journal of Gastroenterology*; Science Citation Index

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INTRODUCTION

Journal quality evaluation is an important subject of concern to both editors and readers. Although the evaluation indexes are frequently the citation data of the papers in a given journal such as the total citation frequency, impact factor and so on, paper publication data for the journal, such as the number of papers and authors' origins can also reflect the journal's academic status in the relevant disciplines. *World Journal of Gastroenterology (WJG)* is an English journal founded in 1995 and published by Baishideng Publishing Group. In 2005 and 2008, 2 papers analyzed the multiple indexes of *WJG* for the periods of 1998–2004 and 2001–2007, respectively^[1,2]. Following the above 2 papers, this study compared and analyzed the various indexes of the papers published in *WJG* in each year from 2008–2012 and the citations of these papers. We also selected 6 internationally renowned journals of gastroenterology including *American Journal of Gastroenterology*, *BMC Gastroenterology*, *Gastroenterology*, *Journal of Clinical Gastroenterology*, *Journal of Gastroenterology* and *Scandinavian Journal of Gastroenterology* for comparative analysis of the relevant indexes with *WJG*. Based on analysis of the above indexes, this study intended to determine not only the development and changes of *WJG* in the past several years, but also the characteristics of the published papers and the origins of the authors of this journal.

MATERIALS AND METHODS

The Journal Citation Report (JCR) of ISI Web of Knowledge^[3] and SCI-E^[4] database were employed. The JCR database was searched to identify the number of references, the number of self-citations, the self-citation rate, and other indicators in *WJG* during 2008–2012. The SCI-E database was retrieved to identify the papers included in *WJG* every single year from 2008 to 2012; in addition, the relevant items including Title, Author, Source, Document Type, Times Cited, and Addresses were analyzed. Bibliometric methods were utilized for statistical analysis of the author's degree of collaboration, the

collaboration rate, the first author's productivity, high-production authors, the authors' geographic areas and/or country related to this journal in each year; the distribution of the countries and journals for the authors citing *WJG* papers was also analyzed. In the meantime, the 2012 issues of *American Journal of Gastroenterology*, *BMC Gastroenterology*, *Gastroenterology*, *Journal of Clinical Gastroenterology*, *Journal of Gastroenterology*, *Scandinavian Journal of Gastroenterology* and *WJG* were retrieved and compared. The comparative indexes included the number of annual publications, the author's degree of collaboration, the collaboration rate, the number of countries of origin for all the authors, the proportion of papers written by native authors, the impact factor in 2012, discipline ranking and self-citation rate. Meanwhile, comparative analysis with *WJG* was carried out to determine the relative performance of various indexes of *WJG*.

Statistical analysis

RESULTS

Basic situation of WJG in 2008–2012

WJG published 48 issues yearly in 2008–2012, and during the period SCI-E indexed 1200, 964, 916, 762 and 1008 *WJG* items in the respective years, giving a total inclusion of 4850 items; the included 5 types of items were article, review, editorial, letter and biography. The number of indexed articles and reviews was 1112, 863, 813, 677 and 944 in the respective years, a total of 4409 papers. The results and conclusion of our research are from the analysis of these 4409 papers. Table 1 lists the number of references, the average number of references in each paper, the number of self-citations in the journal, the average number of self-citations and the self-citation rate.

Description of the authors of WJG papers between 2008 and 2012

There were 26600 authors from 4409 papers. Table 2 lists the distribution of

the number of co-authors (mono-authorship and co-authorship), and 3898 were first authors; 3526 (90.46% of 3898 first authors) published 1 paper, 291 (7.47%) 2 papers, 59 (1.51%) 3 papers, 11 (0.28%) 4 papers, and 11 (0.28%) 5 or more papers. Table 3 shows the authors who published 5 or more papers.

Distribution of author's geographic area and main country

According to the 6 continents geographically, the authors' addresses were mainly located in Asia, Europe and North America (Figure 1). Table 4 lists the number of papers published by authors of the top 15 countries. Of the top 15 countries, there were 5 countries in Asia, 7 in Europe, 2 in North America and 1 in South America.

Distribution of the countries and journals for authors citing WJG papers

Authors from 66 countries cited 3194 of the papers (72.44%), with a total of 19872 citations. The authors from the United States of America were the top and responsible for 4716 citations (23.73% of the total); authors from China ranked second and were responsible for 3088 citations (15.54%); the third was Japan with 1617 citations (8.14%). The top 15 countries were responsible for 18889 citations (95.06% of the total cited) (Figure 2). These citations were from 2083 journals, and the top 15 of these journals gave 3373 citations (16.97% of the total) (Table 5).

Comparison of the relevant data of gastroenterological journals

The data of the JCR database can be used to analyze the citation status of journals, we can evaluate the quality of the journals in each discipline. The Gastroenterology and Hepatology category of JCR 2012 Science Edition included 74 journals, and mean value of impact factor of these journals was 3.115. The 7 representative journals are *American Journal of Gastroenterology*, *Gastroenterology*, *BMC Gastroenterology*, *Journal of Clinical Gastroenterology*, *Journal of Gastroenterology*, *Scandinavian Journal of Gastroenterology*, and *WJG*; of

these, 3 journals are from North America, 2 from Europe, and 2 from Asia. Table 6 lists the number of papers, author's degree of collaboration, author's collaboration rate, geographical distribution of the authors, proportion of articles contributed by domestic authors, 2012 impact factor (IF), discipline ranking of the journal by IF, and self-citation rate for these 7 journals in 2012.

DISCUSSION

The publishing frequency of *WJG* was stable during 2008–2012, without significant changes in the annual number of papers published and the average number of papers in each issue. The average number of references in each paper increased gradually while the self-citation rate decreased gradually year by year. When compared with 2004, the average number of references in each paper in 2012 increased by 8.9^[1], while the self-citation rate per article decreased by 0.73^[1] in 2012; all the indexes were in a satisfactory state.

The degree of collaboration increased slightly while the collaboration rate decreased slightly during 2008–2012. The collaboration degree for each respective year was 5.85, 5.88, 6.20, 5.96 and 6.31; the mean collaboration degree was 6.03 and increased by 0.15 when compared with 5.88 during 2001–2007^[2]. The collaboration rate for each year was 95.59%, 96.76%, 96.56%, 96.90% and 96.72%; the mean collaboration rate was 96.44%. In contrast with the slight increase in collaboration degree during 2008–2012, the collaboration rate during this period decreased by 1.22% when compared with the 97.66% during 2001–2007.

The origin of the authors diversified and the proportion of authors with 1 paper increased, but the high-productivity authors did not increase. During 2008–2012, 3526 authors published 1 paper in *WJG* accounting for 90.46% of the total authors, and 22 authors published 4 papers or more accounting for 0.56%. The core author group of this journal has yet to increase.

The number of author geographic areas increased: the origin of *WJG*

authors became increasingly diversified; the authors came from 87 countries across the 6 continents of the world. Asia, Europe and North America were the main origins of the authors; and the proportion of authors from Asia was relatively stable; the number of papers contributed by authors from Asia was 672 (60.60%), 500 (58.07%), 473 (58.18%), 398 (58.88%) and 603 (63.88%) in respective years. The number of authors from Europe and North America changed little in each year and only decreased slightly in 2012. The number of papers contributed by authors from North America was slightly higher when compared with the data during 2006–2007^[2] but the number was slightly lower during 2011–2012. The number of author countries exceeded 60 in each year; these authors came from a total of 87 countries and/or regions. The origin of the first authors of *WJG* became increasingly diversified and the number of originating countries increased when compared with the data of the period of 2001–2007.

The distribution of the author countries tended to be balanced: authors from the top 15 countries published 3742 (84.87%) papers. The proportion of papers published by Chinese authors showed an annual incremental trend, which coincided with an overall increase in the number of scientific publications in China. The ranking of the top 15 countries have changed; the contemporary top 5 countries were China, Japan, the United States, South Korea and Italy. The international trend in the origin of *WJG* authors increased significantly.

During 2008–2012, 72.44% of all *WJG* papers were cited; although the time factor of 2012 may be responsible for the relatively lower number of citations, and therefore affected the citation rate of *WJG*, but the rate reflected the fairly satisfactory quality of *WJG* papers. The authors citing these papers were distributed among 66 countries or regions; American authors were ranked first and accounted for 23.73%, while Chinese authors were ranked second and accounted for 15.54%. The significant impact of *WJG* around the world was evidenced by the fact that 1140 journals cited *WJG* papers, and the

distribution of the citing journals was dispersed widely.

The changes in *WJG* in the past 5 years were compared with another 6 journals of gastroenterology at the same time. *WJG* had the highest number of annual publications; authors' degree of collaboration in *WJG* was slightly lower than that of the other 6 journals, while the collaboration rate was within a reasonable range; the origin of *WJG* authors was the most diversified, and has gradually expanded from the predominant Chinese author group at the early stage to Asia and even the entire world across the 6 continents. Based on the data in JCR 2012, *WJG* ranked fifth of the 7 journals of gastroenterology; its self-citation rate declined and all other indexes were fairly reasonable.

In summary, *WJG* is attracting the attention of gastroenterologists globally, with authors scattered among 87 countries across the 6 continents. It has become a stage for gastroenterologists around the world to demonstrate their research findings. The author's geographic areas and countries are widely distributed, and all the indexes of this journal are stable and reasonable. *WJG* has embarked onto the track of normal internationalized publication, although it is still necessary to cultivate the core author group for the journal to establish its stable research characteristics.

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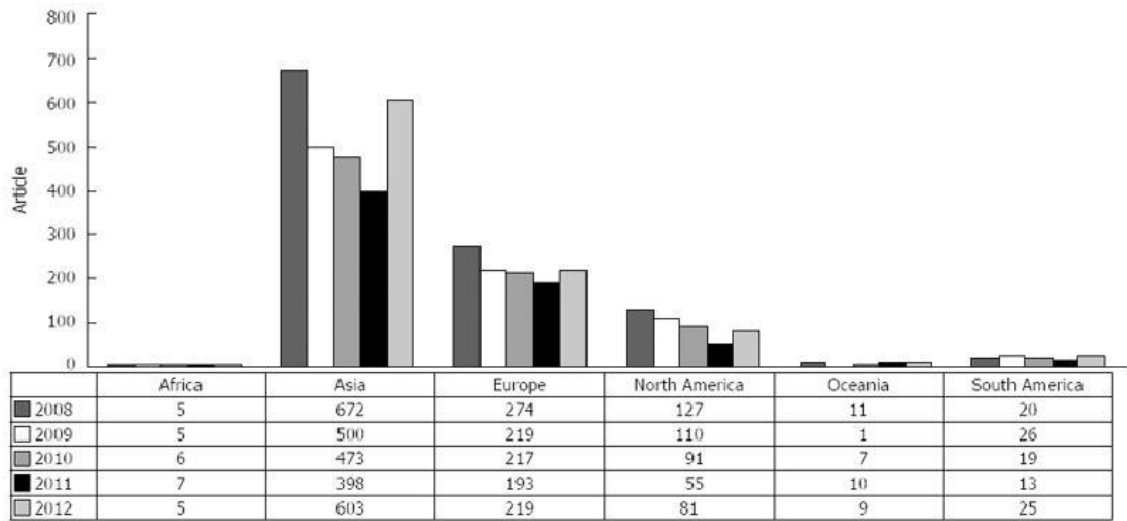


Figure 1 Distribution of *World Journal of Gastroenterology* authors among the continents between 2008 and 2012.

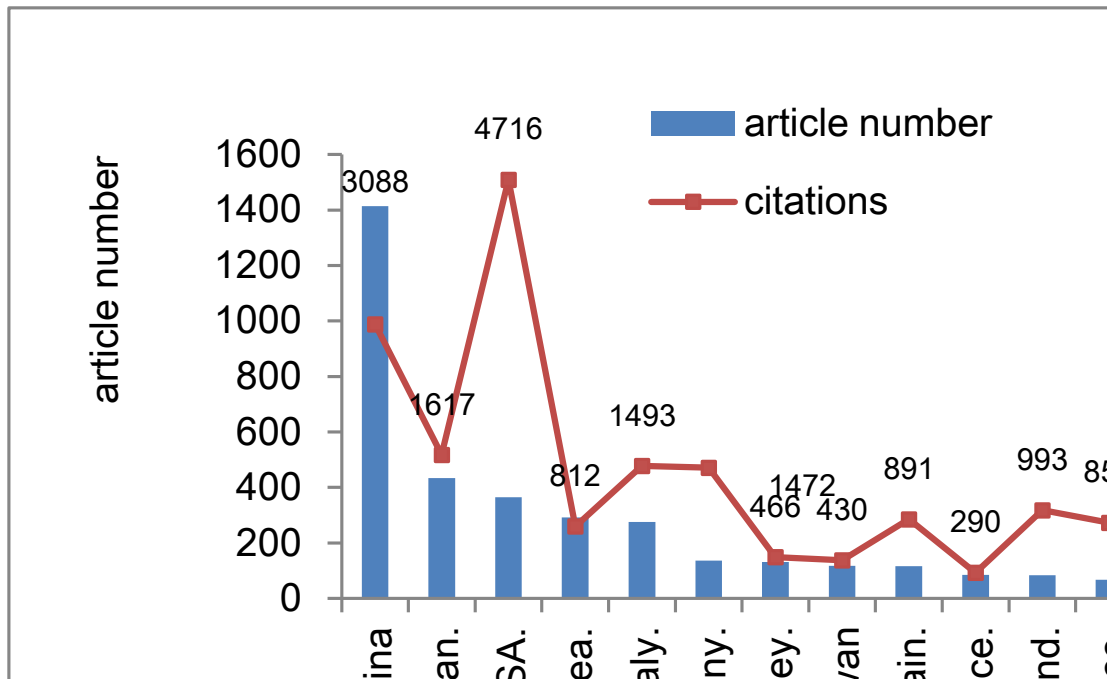


Figure 2 Comparison between the countries of authors citing *World Journal of Gastroenterology* papers of 2008-2012 and the countries of authors publishing *World Journal of Gastroenterology* papers.

Table 1 Literature indexes for papers published in *World Journal of Gastroenterology* between 2008 and 2012

Years	Number of papers	Number of references	Average number of references	Number of self-citations in the journal	The mean number of self-citations in each paper	Self-citation rate
2008	1112	40485	36.41	930	0.84	8.59%
2009	863	29458	34.13	767	0.89	6.02%
2010	813	29624	36.44	832	1.02	5.50%
2011	677	25878	38.22	758	1.12	4.47%
2012	944	37947	40.20	918	0.97	5.21%

Table 2 Co-author collaboration status in *World Journal of Gastroenterology* in 2008-2012

Year	Distribution of number of co-author articles											Total (articles)	Authors	Cooperation degree	Cooperation rate
	1	2	3	4	5	6	7	8	9	10	≥11				
2008	49	96	91	147	154	167	11	12			71	1112	6501	5.85	95.59%
							1	1							
2009	28	66	100	102	139	107	10				56	863	5072	5.88	96.76%
							7	74	46	38					
2010	28	62	77	84	113	108	10				106	813	5037	6.20	96.56%
							8	74	53	46					
2011	21	46	63	77	103	87	10				30	677	4034	5.96	96.90%
							0	96	29	25					
2012	31	67	86	122	95	137	11						5956	6.31	96.72%
							1	91	57	57	90	944			
Total	15	33					53	45	24	20			2660		
1	7	7	417	532	604	606	7	6	8	8	353	4409	2660	6.03	96.44%

Table 3 Authors with 5 or more publications in *World Journal of Gastroenterology* between 2008 and 2012

Author	Institute	Number of papers of first authors	Number of papers of communicating authors	Number of the cited papers	Citation frequency
Freeman, Hugh James	Univ British Columbia Hosp, Canada	22	22	22	133
Tarantino, Giovanni	Univ Naples Federico II, Med Sch Naples, Italy	7	9	7	42
Ishikawa, Toru	Saiseikai Niigata Daini Hosp, D Japan	7	7	5	20
Akbulut, Sami	Diyarbakir Educ and Res Hosp, Turkey	7	8	5	18
Hirasaki, Shoji	Sumitomo Besshi Hosp, and Kubo Hosp, Japan	7	8	6	27
Sporea, Ioan	Univ Med and Farm Timisoara, Romania	5	5	5	52
Katsinelos, Panagiotis	Cent Hosp, Greece.	5	5	4	19
Lohsiriwat, Varut	Mahidol Univ, Siriraj Hosp, Thailand.	5	5	5	48
Terada, Tadashi	Shizuoka City Shimizu Hosp, Japan	5	5	3	41
Sun, Long;	Xiamen Univ, Affiliated Hosp 1, P R China	5	0	4	37
Lee, Tae Hoon;	Soon Chun Hyang Univ, Coll Med, Cheonan Hosp, S Korea	5	2	4	9

Table 4 Distribution of the top 15 countries or regions in *World Journal of Gastroenterology* during 2008-2012

Country name	2008	2009	2010	2011	2012	Total	Percentage
China	361	276	290	240	365	1532	34.75%
Japan	121	74	80	52	107	434	9.84%
United States	94	79	74	49	69	365	8.28%
South Korea	60	62	45	51	74	292	6.62%
Italy	54	53	53	60	56	276	6.26%
Germany	34	26	28	28	20	136	3.08%
Turkey	48	33	19	19	12	131	2.97%
Spain	31	35	13	16	21	116	2.63%
Greece	30	15	18	15	7	85	1.93%
England	23	18	16	9	17	83	1.88%
France	20	12	14	8	13	67	1.52%
Brazil	15	12	12	8	19	66	1.5%
Canada	23	13	9	3	11	59	1.34%
Netherlands	17	9	12	7	9	54	1.22%
Thailand	13	5	11	6	11	46	1.04%
Total	1305	998	984	811	1176	3742	84.87%

Table 5 Main journals citing *World Journal of Gastroenterology* papers published between 2008 and 2012 *n* (%)

No.	Name of the citing journals	Quantity (<i>n</i>)
1	<i>World Journal of Gastroenterology</i>	1131 (5.69)
2	<i>PLOS ONE</i>	430 (2.16)
3	<i>Digestive Diseases and Sciences</i>	198 (1.00)
4	<i>Gastrointestinal Endoscopy</i>	180 (0.91)
5	<i>Journal of Gastroenterology and Hepatology</i>	171 (0.86)
6	<i>Alimentary Pharmacology Therapeutics</i>	147 (0.74)
7	<i>Inflammatory Bowel Diseases</i>	147 (0.74)
8	<i>Journal of Hepatology</i>	138 (0.70)
9	<i>Hepato Gastroenterology</i>	137 (0.69)
10	<i>Endoscopy</i>	122 (0.62)
11	<i>European Journal of Gastroenterology & Hepatology</i>	120 (0.60)
12	<i>Hepatology</i>	120 (0.60)
13	<i>Gastroenterology</i>	114

		(0.57)
14	<i>American Journal of Gastroenterology</i>	110
		(0.55)
15	<i>Scandinavian Journal of Gastroenterology</i>	108
		(0.54)
	Total	3373
		(16.97)

Table 6 Data comparisons of the 7 representative gastroenterology journals in 2012

Journal name	Articles published in 2012	Cooperation degree in 2012	Cooperation rate in 2012	Geographical distribution of authors	Ratio of articles contributed by domestic authors	2012 IF	Ranking of discipline impact factors	Self-citation rate in 2012
<i>Am J Gastroenterol</i>	190	7.50	94.74	32	United States 45.16	7.553	7	3.36
<i>BMC Gastroenterol</i>	165	7.35	98.79	36	China 21.21	2.110	42	2.60
<i>Gastroenterology</i>	278	10.55	97.48	44	United States 44.25	12.821	1	2.20
<i>J Clin Gastroenterol</i>	154	6.41	96.10	24	United States 38.96	3.203	23	3.10
<i>J Gastroenterol</i>	140	9.53	98.57	22	Japan 76.43	3.788	17	3.34
<i>Scand J Gastroentero</i>	179	6.40	98.88	35	Sweden 21.79	2.156	40	3.29
<i>World J Gastroentero</i>	944	6.31	96.72	58	China 35.67	2.547	34	5.21

