

REVIEW

# A brief statistical analysis of stomatology papers published in international journals by researchers from the mainland of China

– Based on Thomson Reuters' Journal Citation Reports for 2009

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This paper has briefly analyzed the publication status of Chinese stomatology papers in 2009 with statistics from Journal Citation Reports<sup>®</sup> provided by Thomson Scientific. Only those papers with the first author coming from the mainland of China were included for calculations. We have found a significant increase in the number of SCIE-indexed papers, most of which were published by six dental institutions in China. Among all Chinese medical institutions, West China School of Stomatology Sichuan University is the first dental institution to enter the top-20 list with the most publications, and it also ranks the 9th in the number of outstanding articles. West China School of Stomatology Sichuan University and the Forth Military Medical University are the only two dental institutions in China which have published SCIE-indexed papers over a hundred. The former has published the most SCIE-indexed stomatology papers, while the latter has the highest average impact factor. As the laboratories and funds in China have close connections with various dental hospitals, the practice of translational medicine in dentistry is fast and fluent.

**Keywords:** oral; dentistry; Journal Citation Reports; SCIE-indexed papers

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## Introduction

In this paper, we have briefly analyzed the publication status of Chinese scientific papers in 2009. Related statistics were derived from Web of Science provided by Thomson Scientific. Only those papers with the first author coming from the mainland of China were included for calculations [1-3].

## Overall status

In 2009, there are 127 532 papers indexed by the Science Citation Index-Expand (SCIE) database, of which 108 805 were written by authors from the mainland of China. Five hundred and ninety three of the 108 805 scientific papers were written by dental clinical and research institutions, accounting for half a percent of the total number, which includes 559 articles, 14 reviews and 11 letters. The average literature indices of these papers are as follows: 5.6 authors (4.7 for the national level), 2.5 institutions (2.0 for the national level), 28.1 references (26.7 for the national level), and an Immediacy Index 0.61 (0.77 for the national level). Compared

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with the statistics for 2006, the number of articles has increased by 382 (227%), while the number of reviews has increased by 10 (333%).

According to Journal Citation Reports (JCR) for 2009 at Web of Science, there are 64 dental journals indexed by SCIE with the statistical measures reported (Table 1).

These 64 journals have published a total of 6 924 articles and reviews, 260 of which were written by Chinese authors, accounting for 3.76%. Compared with 2006, the proportion of journals with the first author from the mainland of China has increased by 84%, and the proportion of Chinese papers has increased by 1.4%.

**Table 1** The 64 dental journals indexed by SCIE with the statistical measures reported in JCR for 2009

Abbreviated journal title	Country/ Territory	Total cites	Impact factor	Immediacy index	Articles	Chinese articles	References	% of Chinese articles
Acta Odontol Scand	Norway	2 134	1.412	0.140	57	2	30.6	3.509
Am J Dent	USA	1 783	1.314	0.113	71	1	32.6	1.409
Am J Orthod Dentofac	USA	7 929	1.327	0.182	253	4	31.6	1.581
Angle Orthod	USA	3 178	0.937	0.153	170	9	26.1	5.294
Arch Oral Biol	UK	4 452	1.649	0.392	171	13	37.7	7.602
Aust Dent J	Australia	1 022	1.220	0.221	68	0	35.4	0.000
Brit Dent J	UK	2 950	1.089	0.522	136	1	23.1	0.735
Brit J Oral Max Surg	UK	2 475	1.327	0.210	162	12	12.0	7.407
Caries Res	Switzerland	2 904	2.462	0.581	62	0	29.2	0.000
Cleft Palate-Cran J	USA	2 301	0.884	0.113	97	4	26.1	4.124
Clin Implant Dent R	Canada	1 111	2.452	0.316	38	1	32.4	2.632
Clin Oral Implan Res	Denmark	5 416	2.920	0.314	188	7	37.9	3.723
Clin Oral Invest	Germany	956	2.233	0.455	55	0	36.9	0.000
Community Dent Hlth	UK	678	0.969	0.100	20	0	18.2	0.000
Community Dent Oral	Denmark	2 567	2.418	0.194	62	2	35.2	3.226
Cranio	USA	430	0.412	0.500	8	0	35.1	0.000
Dent Mater	UK	5 661	2.882	0.457	208	7	32.2	3.365
Dent Mater J	Japan	857	0.929	0.084	95	0	29.5	0.000
Dent Traumatol	Denmark	1 325	1.316	0.074	121	2	30.3	1.653
Dentomaxillofac Rad	UK	1 429	1.229	0.247	73	1	25.8	1.370
Eur J Dent Educ	USA	356	1.024	0.250	44	0	21.8	0.000
Eur J Oral Sci	Denmark	2 340	1.956	0.159	107	4	34.2	3.738
Eur J Orthodont	UK	2 340	0.975	0.102	98	0	33.1	0.000
Gerodontology	USA	465	1.014	0.045	44	0	27.7	0.000
Implant Dent	USA	900	1.505	0.150	60	0	29.6	0.000
Int Dent J	UK	1 223	0.632	0.196	51	0	38.2	0.000
Int Endod J	UK	3 642	2.223	0.328	128	2	36.7	1.563
Int J Oral Max Impl	USA	5 440	1.978	0.056	143	4	37.1	2.797
Int J Oral Max Surg	UK	4 103	1.444	0.130	200	19	22.9	9.500
Int J Paediatr Dent	USA	846	1.141	0.230	61	0	28.4	0.000
Int J Periodont Rest	USA	1 932	1.702	0.086	58	2	29.6	3.448
Int J Prosthodont	USA	2 318	1.227	0.111	99	3	18.9	3.030

Cont. Table 1

Abbreviated journal title	Country/ Territory	Total cites	Impact factor	Immediacy index	Articles	Chinese articles	References	% of Chinese articles
J Adhes Dent	UK	938	1.638	0.071	56	1	35.6	1.786
J Am Dent Assoc	USA	4 800	1.726	0.426	108	0	34.3	0.000
J Appl Oral Sci	Brazil	201	0.386	0.092	109	0	26.8	0.000
J Can Dent Assoc	Canada	929	0.959	0.182	44	0	25.7	0.000
J Clin Periodontol	Denmark	7 155	3.549	0.350	140	3	36.9	2.143
J Cranio Maxill Surg	UK	1 699	1.252	0.176	74	1	23.2	1.351
J Dent	UK	3 271	2.000	0.169	136	4	33.6	2.941
J Dent Educ	USA	1 747	1.087	1.362	127	0	23.3	0.000
J Dent Res	USA	12 340	3.458	0.302	172	6	39.5	3.488
J Dent Sci	Chinese Taipei	16	0.107	0.000	28	0	32.9	0.000
J Endodont	USA	7 898	2.953	0.487	277	14	31.6	5.054
J Esthet Restor Dent	UK	395	0.797	0.139	36	0	24.1	0.000
J Oral Maxil Surg	USA	8 986	1.580	0.229	424	29	26.1	6.840
J Oral Pathol Med	Denmark	3 198	2.144	0.385	117	14	40.0	11.966
J Oral Rehabil	UK	3 546	1.483	0.142	113	6	36.8	5.310
J Orofac Orthop	Germany	388	0.890	0.086	35	0	36.8	0.000
J Orofac Pain	USA	963	1.263	1.621	29	0	45.4	0.000
J Periodontal Res	Denmark	2 549	1.966	0.310	100	8	37.9	8.000
J Periodontol	USA	10 313	2.192	0.278	237	7	38.7	2.954
J Prosthet Dent	USA	6 680	1.215	0.119	101	2	25.4	1.980
J Public Health Dent Odontology	USA Japan	738 103	0.961 0.650	0.195 0.118	41 17	0 0	27.1 43.9	0.000 0.000
Oper Dent	USA	2 188	1.683	0.130	100	1	32.8	1.000
Oral Dis	Denmark	1 681	1.922	0.325	83	4	46.8	4.819
Oral Microbiol Immun	Denmark	1 973	2.336	0.386	83	1	36.6	1.205
Oral Oncol	UK	3 905	3.123	0.773	207	21	36.7	10.145
Oral Surg Oral Med O	USA	10 077	1.499	0.143	447	33	29.4	7.383
Orthod Craniofac Res	USA	446	1.607	0.184	38	0	39.6	0.000
Periodontol 2000	Denmark	1 760	3.027	1.474	38	0	114.1	0.000
Quintessence Int	USA	1 790	0.635	0.106	113	5	24.5	4.425
Rev Stomatol Chir	France	250	0.349	0.031	64	0	12.9	0.000
Swed Dent J	Sweden	639	0.927	0.045	22	0	25.8	0.000

Sixteen of the 64 dental journals have an impact factor greater than 2, which have altogether published 2 148 papers in 2009 (Table 1). Chinese authors have published 89 papers in 13 of the 16 journals, which account for 4.1% of the 2 148 papers. However, Chinese researchers

have only published four papers in *J Clin Periodontol*, a dental journal with the highest impact factor (IF). Chinese articles account for 2.14% of the 140 papers published by *J Clin Periodontol*. When it comes to the dental journal with the highest total cites, *J Dent Res*,

Chinese authors have only published six papers, consisting 3.5% of the total amount.

Thirty eight of the 64 journals (59.4%) have published papers with the first author from China. Of the 38 journals, two have published over ten Chinese papers, they are respectively *J Oral Pathol Med* (14 Chinese papers, 11.97% of all the papers published in the journal) and *Oral Oncol* (21, 10.15% of all the papers published in the journal).

### Analysis of Chinese dental papers published in international journals

#### *Demographic and Institutional Distribution of Chinese Papers*

In 2009, 57 Chinese institutions have published scientific papers indexed by SCIE. These institutions distribute in 21 Chinese provinces and municipalities, seven of which have published papers over 20. Sichuan province stands on the top of the list (137 papers), which is sequentially followed by Shanxi province (105 papers), Hubei province (74 papers), Shanghai (70 papers), Beijing (62 papers), Guangdong province (57 papers) and Zhejiang province (26 papers). The other ten provinces and municipalities in China have not published papers in SCIE-indexed journals. China has approximately five hundred medical institutions which have published SCIE-indexed papers. Among these, West China School of Stomatology ranks the 9th in the number of outstanding articles among all Chinese medical institutions (outstanding articles refer to those with higher immediate citations than the average level of the same field). With respect to the total number of papers, West China

School of Stomatology is the first dental hospital to enter the top-20 list with the most publications.

The top six institutions which have published SCIE-indexed papers over 30 are listed below (Table 2). What needs to be noted is that Sichuan University West China School of Stomatology and the Fourth Military Medical University are the only two dental institutions in China which have published SCIE-indexed papers over a hundred. The average statistical measures are shown in Table 3. Of all the six institutions, with respect to the number of references, immediate cites in 2009 and the number of reviews, West China School of Stomatology ranks first. When it comes to the average impact factor, the Forth Military Medical University tops the list.

**Table 2** Chinese dental institutions which have published over 30 SCIE-indexed papers in 2009

Name of institution	No. of papers published
Sichuan University, West China School of Stomatology	137
The Fourth Military Medical University, School of Stomatology	105
Wuhan University, School of Stomatology	69
Shanghai Jiaotong University, School of Stomatology	63
Beijing University, School of Stomatology	49
Sun Yet-sen University, Guanghua School of Stomatology	32

**Table 3** The six Chinese institutions which have published the most SCIE-indexed papers in 2009

Name of Institution	Papers	Articles	Reviews	Authors	Institutions	Impact factor	References	Times cited
Sichuan University, West China School of Stomatology	137	133	4	6.3	2.4	2.076	33.5	0.83
The Fourth Military Medical University, School of Stomatology	105	98	2	6.3	2.9	2.453	30.3	0.74
Wuhan University, School of Stomatology	69	67	2	4.9	2.6	2.145	30.1	0.64
Shanghai Jiao Tong University, School of Stomatology	63	60	1	6.0	2.6	2.056	26.4	0.45
Beijing University, School of Stomatology	49	47	0	4.7	2.3	2.145	27.0	0.66
Sun Yet-sen University, Guanghua School of Stomatology	32	31	1	5.4	2.4	2.339	28.6	0.58

Notes: In this table "Papers" refers to all kinds of publications; "Articles" includes articles, letters and editorials; "Authors", "Institutions", "Impact factor" and "References" are averages. "Times cited" refers to the number of citations in 2009.

These six dental institutions have rich medical and research resources. The research capacity of the six institutions is strong and research output has reacted in accordance. However, there are still a lot of dental institutions without papers indexed by SCIE.

#### *Subject Category Distribution of Chinese Papers*

Of the 174 SCI subject categories, Chinese papers are involved in 57 subjects, 16 subjects have published over five Chinese papers per subject, five of which have published over 30 Chinese papers per subject. The subject having published the most Chinese papers in 2009 is *DENTISTRY* with 44% (239) of all the papers published being Chinese papers. The SCIE subjects with the proportion of Chinese papers after *DENTISTRY* are listed in Table 4. It can be deduced that the scientific output of China has a wide distribution of subjects. A crosslink of diverse research fields is also obviously observed.

**Table 4** SCIE subjects category distribution of Chinese papers for 2009

No. of papers	Subject category
239	Dentistry
43	Medicine
41	Oncology
36	Engineering
34	Biochemistry & Molecular Biology
25	Surgery
12	Biotechnology & Applied Microbiology
10	Cell Biology
8	Cell & Tissue Engineering
8	Chemistry
8	Materials Science
8	Pathology
6	Anatomy & Morphology
6	Biochemical Research Methods
6	Computer Science

#### *Trends of Chinese Paper Publication*

In 2009, the 593 Chinese SCIE-indexed papers were distributed in 215 international journals, and only 260 of which were published in the 64 SCIE-indexed dental journals. This means that over a half of the 593 papers

get published in non-dental journals. Therefore it can be classified as a diversified scientific research output. Seven SCIE indexed journals have published over ten Chinese papers, and *Medical Hypotheses* ranks first with 35 papers (see Table 5). The trend of Chinese paper publication can also be reflected in the 64 SCIE-indexed journals (see Table 6).

**Table 5** SCIE-indexed journals with over 10 Chinese papers published

No. of papers	Abbreviated journal title
35	Med Hypotheses
34	Oral Surg Oral Med O
29	J Oral Maxil Surg
28	Oral Oncol
19	Int J Oral Max Surg
14	J Endodont
14	J Oral Pathol Med

**Table 6** Publication trends of Chinese papers

Country	No. of Journals	Chinese papers	% of Chinese papers
USA	15	124	47.69
UK	12	88	33.85
Denmark	9	45	17.31
Norway	1	2	0.77
Canada	1	1	0.38
Total	38	260	100.00

These 260 papers are scattered in 38 dental journals edited by five countries; nearly a half of these papers were published by American journals. There are 25 American journals, 16 British journals and ten Danish journals indexed by SCIE. Chinese authors have published 124 papers in 15 of the 25 American journals; 88 papers in 16 British journals and 45 papers in 9 Danish journals. The number of Chinese papers published in SCIE-indexed Norwegian and Canadian journals was, respectively, two and one. All of the reported Chinese papers were written in English. Therefore, there is a trend for Chinese authors to publish their research findings in American and British journals.

#### **Conclusions**

There is a significant increase in the number of scientific papers published by Chinese dental institutions in 2009 compared to previous years. This increase can be largely attributed to the contributions of a number of

basic research laboratories established in China. This can be interpreted as another example of the fact that only scientific research is able to produce scientific papers continuously. These laboratories have produced 146 of all the 573 original articles and reviews, accounting for a little over a quarter (25.5%) of the total amount. State Key Laboratory of Oral Diseases located at West China School of Stomatology contributed 75 papers (accounting for 54.7% of the total SCIE papers published by the School), Key Laboratory of Oral Biomedical Engineering located at Wuhan University contributed 45 papers (65.2%), and Shanghai Ninth People's Hospital Affiliated Shanghai Jiaotong University School of Medicine has contributed 23 papers (36.5%).

What is worth mentioning is that these laboratories have close connections with various dental hospitals in China. Therefore, the transformation from findings of basic scientific research into clinical practice is fast and fluent.

The increase of scientific papers published is closely related to government's support of scientific research in dentistry. Taking 2009 as an example, 350 of the 593 Chinese SCIE indexed papers were supported by various foundations and government grants. Two hundred and one papers were supported by national grants. Various statistical indices of SCIE indexed Chinese papers have risen to different extent in 2009.

The SCIE has classified 174 subject categories altogether, 57 of which have involved Chinese papers and Chinese authors have published over 5 papers per subject in 16 subjects. This indicates that dental research in China is inter-linked with a variety of different fields, e.g. materialogy, cell biology etc. (see Table 4).

Five Chinese papers have an immediacy index greater than 5, four of which come from Sichuan University West China School of Stomatology, while the other comes from The Fourth Military Medical University School of

Dentistry. The paper with the highest immediacy index of 12 is published in *Cancer Letters* by State Key Laboratory of Oral Diseases located at West China School of Stomatology Sichuan University.

The number of dental institutions having published SCIE-indexed papers has increased also. In 2006, only 24 dental institutions (Name of the institution contains STOMATOL or ORAL) had published SCIE indexed papers. This number has gradually increased to 62 in 2009. At the same time, the number of international papers published by those 24 dental institutions has increased too.

It is estimated that Chinese scientific research output will further increase in the future. What needs to be noted is that the mainland of China already has an English dental journal indexed in the SCIE/PubMed databases since 2009 – *International Journal of Oral Science*, which adds to another wonderful platform for publication of findings of scientific studies. However, there is still a long way to go to enhance the influence of Chinese scientific papers as well as Chinese scientific journals.

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