Original Article

Contribution of Iranian Researchers in Dental Science Production as Indexed in Web of Science From 2000 to 2009

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Abstract

Background and Aim: Nowadays the most significant indicator for scientific production is the number of scientific articles that are indexed in certificated databases. Evaluation of the scientific production has become so significant as an important aspect of research and scientific production, in the way that today production and consumption of information in different communities is one of the growth and development indicators. The aim of this article is to investigate 10-years of scientific production of Iranian dentistry community in the ISI.

Materials and Methods: In this article ten years of scientific production in dentistry in ISI database was investigated using bibliometric method. Therefore, our search was limited to *Iran* and *dentistry* during 2000-2009, and the retrieved items were analyzed.

Results: It was shown that a total of 383 documents have been produced and published in this time period, among which 350 (91.4%) was authored by dental professionals in 10 Iranian universities. In this regard, Tehran University of medical sciences researchers have authored 30/8% of all productions. The most international cooperation of the Iranian dentistry researchers has been with the researchers of USA with 28 articles followed by Australia, England and Finland. Concerning journals publishing the research of the Iranian dental community, the Journal of Endodontics, has published 34 documents of all productions in this realm.

Conclusion: Our search showed that the scientific productivity of Iranian dentists has been ascending in these years. The growth reached the top in 2009, and became doubled compared with the previous year and ten times more than those in 2000.

Key Words: Scientific production, dentistry, ISI web science

Introduction

Scientific development is evaluated in each society through scientific activities of the researchers. Such evaluation is extremely necessary for research programming and implementation in each country [1]. Assessment and evaluation of science has long been concerned, since it is assumed that the science is able to aid in all affairs including health and well-being of the world-wide community [2]. Scientific and technical intake was deemed by UNESCO in 1982 as a pivotal prerequisite for improvements in developing countries.

Economic development of a country is collectively dependent upon its scientific power and ability to resolve problems in different fields including well-being, communicable disease control, environmen-

tal management or industrial development. Hence, identification of the most influential organizations, individuals and other factors related to the scientific production can increase collaborations in line with scientific improvements [3].

Scientific productions in each country are regarded as indices of scientific activities both nationally and internationally. Herein, quality and quantity of scientific production is at the center of attraction and can be followed through scientific databases. [4] In addition, the worldwide web is a major source of information for quantitative investigations to discover formal and informal scientific interrelationships [5]. Assessment and evaluation of the scientific productions and activities is always taken into consideration by scientometric experts, due mainly to the role and importance of scientific interrelations in obtaining newer findings. One of the most common methods to evaluate scientific activities is the scientometric methods wich is based upon four major variables of authors, citations, references and publications [6].

Scientometry is an important aspect in research and scientific production, so that production and use of information in different societies is considered as an index for national growth and development. Currently the most significant universal index for scientific production is the number of scientific articles indexed in credited databases such as Web of science. Various scientific journals are indexed in this database based on certain specifications. Numerous investigations have been conducted about scientometric subjects in this database, but the number of such investigations specifically in dentistry is scarce. Assare and Marefat investigated collaboration of Iranian researchers in universal scientific production within MedLine database using scientometric methods from 1976 to 2003 [7]. They emphasized the importance of scientific databases and their significant role in distribution of the scientific papers worldwide.

Hassanzadeh-Esfanjani and colleagues also studied scientific production of Iran in medical fields using scientometric approaches using Scientific Citation Index in a thirty-year period from 1978 to 2007

[8]. They conveyed the most- and the least- frequently studied subjects in the aforementioned period and introduced Tehran University of Medical Sciences as the most active university on scientific production. Similarly, another investigation evaluated the developing rate of article publication in Iran in medical sciences from 1978 to 2007 and deemed Tehran University of Medical Sciences as a leading center for scientific production [9]. Another paper also stated that the rate of scientific production was growing among academicians of Kerman University of Medical Sciences [10]. Qazi and Eftekharian also declared that there was an increasing rate of scientific production in Shiraz and Tehran Universities of Medical Sciences from 2004 to 2008 according to surveys in Scopus and Web of science (11).

The aim of this study was to evaluatecontribution of Iranian researchersin dental science production indexed in Web of science from 2000 to 2009.

Materials and Methods

In this assay data were collected through bibliometrics and direct observation. Samples included all articles of Iranian researchers in the field of dentistry within the Web of science database from 2000 to 2009. The search was done in the aforementioned database using *advance search* in the search field and *Iran* was given as the keyword. Then, *dentistry* was selected in the subject field and search was accomplished. A total of 383 documents showing scientific production of Iranians in the field of dentistry was retrieved. Descriptive statistical analysis was carried out on the international collaborations, affiliations, publication years, document formats, languages, and names of the publishing journals. Data were saved and analyzed in Microsoft Excel spreadsheets and the results presented in tables and graphs.

Results

According to table 1, leading universities in terms of scientific production had 91.4% (n=350) scientific production among which Tehran University of

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Table 1. Leadingscientific producing universities in dentistry

Science producing university	Number of articles	percentage
Tehran University of Medical Sciences	118	30/8
Mashhad University of Medical Sciences	49	12/8
ShahidBeheshti Medical University	48	12/5
Islamic Azad University	29	7/6
Tabriz University of Medical Sciences	27	7
Shiraz University of Medical Sciences	26	6/8
Kerman University of Medical Sciences	21	5/5
Baghiatollah University of Medical Sciences	21	5/5
Hamedan University of Medical Sciences	21	2/9
Others	32	8/6
Total	382	100

Table 2. International cooperation of Iranian researchers in dentistry

Country	Number of articles	percentage
United Stated	28	7/31
Australia	24	6/27
England	16	4/18
Finland	13	3/39
Wales	8	2/09
Canada	7	1/83
South Korea	7	1/83
India	4	1/04
Japan	4	1/04
Nigeria	3	0/78
Scotland	3	0/78
Turkey	2	0/52

Medical Sciences stands first with producing 118 documents (30.8%). This record is followed by Mashhad University of Medical Sciences and Sha-hidBeheshti Medical University producing 49 and 48 documents, respectively. Scientific production of other universities and institutions is demonstrated in table 1. Surveys demonstrate that Motamedi (23 articles), Eslami and Mirfazaelian (13 articles each) are the leading scientific producers.
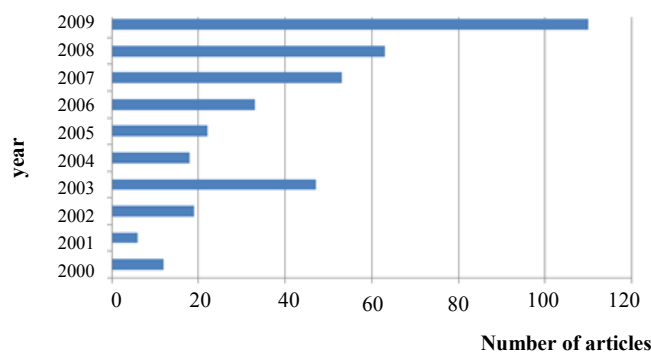
Table 2 shows international collaboration of Iranian researchers in the field of dentistry. The most frequent cooperation was with the researchers of the United States (n=28) followed by Australia (n=24) and England (n=16)

According to graph 1, there were fluctuations in the rate of scientific production in dentistry up to 2003, but its increasing rate initiated in thereafter so that it reached to the maximum in 2009, in which the number was doubled compared with the previous year and 10-folded in comparison with the year 2000.

Table 3 shows the journal titles in which the majority of Iranian scientific documents are published. It shows that Journal of Endodontics stands first with publishing 34 documents (8.88%) of the

Graph 1. Scientific production by Iranian researchers

nationally produced scientific papers. According to table 4 the most preferred subject about which scientific documents is produced was oncology with 19 (4.96%) publications, followed by surgery, biomaterials and materials science. According to graph 2, 295 documents of Iranian authors in dentistry are journal articles which comprise 77.02% of all scientific productions in this field. Congress abstracts comprising of 47(12.27%) documents stand at the next stage. All dental documents producedby Iranian researchers were written merely in English. No other productions were made in any other language in dentistry by Iranian authors.

Table 3. Leading journals publishing Iranian scientific productions

Journals in which Iranian articles are published	Percentage	Number of articles
Journal of Endodontics	8/88	34
Journal of Dental Research	6/79	26
Journal of Oral and Maxillofacial Surgery	6/53	25
Oral Surgery Oral Medicine Oral Pathology Oral Radiology And Endodontology	6/53	25
International Endodontic Journal	5/48	21
Journal Of Prosthetic Dentistry	5/48	21
Oral Oncology	4/96	19
Dental Materials	2/87	11
Australian Endodontic Journal	2/61	10
Australian Orthodontic Australian	2/61	10
Operative Dentistry	2/61	10
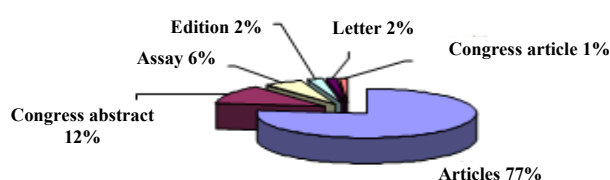
Graph 2. Iranian scientific productions in dentistry

Table 4. Leading study subjects carried out in dentistry by Iranian authors

Subject	Number of documents
Oncology	19
Surgery	18
Biomaterials	17
Materials Science	17

Discussion

It was shown that superior universities in dental science production had 91.4% of all scientific activities in this field.

Tehran University of Medical Sciences stands first producing 118(30.8%) scientific documents. This university has been regarded as the leading university in twenty medical fields. This is congruent with the study done by Hassanzadeh Esfanjaniwho made a scientometric evaluation through Web of science from 1978 to 2007 [8]. This was also corroborated by Eskroochi and coworkers who evaluated the rate of Iranian scientific development

according to Web of science Expanded (SCIE) [9]. Another point is that there has been an increasing rate of scientific production in Iran within a 10-year period. Specifically, between 2004 and 2008 there is a mild increase but after 2009 a pronounced upturn is observed. Similar findings were reported by Bazrafshan and Massahi [10] who investigated the rate of scientific production by academicians of Kerman University of Medical Sciences. Parallel results were reported by Qazimirsaeed and colleagues who evaluated scientific production of Tehran and Shiraz Universities of Medical Sciences documented by Web of science and Scopus from 2004 to 2008 [11].

Maximal collaboration of Iranian researchers were reported to be with their colleagues in the United States producing 28 documents. This was corroborated by Hassanzadeh Esfanjani et al [8]. Expanding international cooperation in scientific production cannot be overemphasized. This can be accomplished through researcher and student exchange programs between national and international institutions.

It was declared that Journal of Endodontics published the highest number of scientific documents. This journal is the most credited dental journals worldwide. It possesses the 10th rank among 341 core dental journals indexed in Index to Dental Literature in 1998, both in terms of article production and citation [12]. It was highlighted that researchers in the field of dentistry had the highest

number of their documents about oncology, surgery, materials science and biomaterials. Dealing with other subjects in the field of dentistry is highly required to have a more homogenous progress.

All scientific documents in the field of dentistry was in English. Although English is an international language and understandable to everyone, scientific production in other languagescan enhance worldwide scientific communication. It was disclosed that the United States, United Kingdom, and Brazil are three leading countries in scientific production. It is noteworthy that Iran ranks 28th among all countries in this regard. According to the abundance of experts in this field, it is expected that Iranian researchers be more concerned about publication of scientific articles in English in universally credited journals.

Conclusion

It can be concluded from the results of this study that:

1. Regarding publication of Iranian research articles in English, scientific writings in other international languages is recommended to improve international scientific exchange.

2. Scientific productions in dentistry is not uniformly distributed, therefore a more homogenous distribution of facilities to have a more consistent scientific results is highly recommended.

3. The majority of the published documents from Iranian universities were produced in 2003 onwards, reaching its maximum in 2009. This result was doubled with respect to the previous year and 10-folded in comparison with the year 2000.

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