

*Original Article***Research performance of Isfahan University of Medical Sciences in 1385
(April 2006- March 2007)***Farzaneh Aminpour****Abstract**

BACKGROUND: One of the frequently used measures of research performance of a country or a university is counting the related scientific production. In the present study the number of scientific production including research projects, books, journal articles and conference proceedings published under the name of Isfahan University of Medical Sciences were identified and then compared with those reported by Iranian Ministry of Health and Medical Education for the year 1384. The purpose of this study was to identify one-year research performance of Isfahan University of Medical Sciences and to show the growth rate of scientific production of this university from 1384 to 1385.

METHODS: The present cross-sectional study was carried out by reviewing related official documents and running advanced searches in some of the most important databases. The time limitation was set on 1385 hijri shamsi, which is equal to the beginning of April 2006 till the end of March 2007.

RESULTS: During the period of the study, Isfahan University of Medical Sciences published 56 books. The total number of approved research projects was 1080, most of which (61.67%) were descriptive studies. A total of 721 journal articles published by the university researchers of which 146 papers were indexed by ISI, 26 papers were indexed by MEDLINE, 194 papers were indexed by EMBASE, Scopus, Biological Abstracts, Chemical Abstracts and CINAHL, 318 articles were indexed by other databases. Only 37 articles published via non-indexed journals. 74.2% of the articles appeared in domestic journals while only 25.8% published in foreign journals. The total number of national and international conference proceedings was 726. The findings showed a significant increase (nearly 100%) in all kinds of scientific productions compared to those published in 1384 except the published books.

CONCLUSIONS: The present study indicates that despite suffering from limitations in annual research budgets and facilities, research performance of Isfahan University of Medical Sciences has increased appreciably during the last year.

KEY WORDS: Research performance, scientific productivity, scientometrics, information databases.

JRMS 2007; 12(6): 308-314

Sustainable development is one of the most frequently discussed issues of the third millennium. Due to the major role of research in sustainable development of countries all around the world, research policies must be designed according to the valid and updated information about the past and present status of research performance and scientific output. Research performance can be evaluated in a region, a country or a university by means of scientometric tools and techniques. In Iran, research performance has

increased appreciably during the recent years especially in regards to the number of scientific publications. This development can be explicitly seen in the basic and applied sciences including medicine and its subspecialties. Some of the major universities in Iran amongst them Isfahan University of Medical Sciences plays an important role in national and international scientific development ¹.

To evaluate the numerical characterization of research performance, many studies have used the number of publications produced by

*MSc, Vice Chancellory for Research, Isfahan University of Medical Sciences, Isfahan, Iran. e-mail: aminpour@mui.ac.ir

authors in the disciplines or in the regions and the number of citations received by those publications as measures of research performance and scientific productivity²⁻⁹. Haiqi studied the research performance of key medical universities in China observed from the scientific productivity. The results showed that Tongji Medical University ranks first while Beijing Medical University is placed second in terms of paper output in Chinese and in English languages. The results also showed that the coverage of Chinese biomedical publications by western indexing services is very poor¹⁰. Valadkhani and Worthington clustered and ranked the research performance of 36 Australian universities according to their research performance over the period of 1998-2002. The results indicated that the top three research performers in terms of total research performance were the Universities of Melbourne, Sydney and Queensland, while the top 3 in terms of per capita academic staff were the Universities of Melbourne, Adelaide, and Western Australia¹¹. Osareh and Marefat studied the scientific productivity of Iranian researchers in MEDLINE from 1976 to 2003. They identified the growth and development of scientific publications in MEDLINE, highly productive authors, universities and popular journals during this period. According to this survey, Isfahan University of Medical Sciences ranked fifth regarding scientific productivity among the other medical universities in Iran¹². Sabouri and Poursasan in their study in 2005 found that the contributions of Iran in science production in the world in science and social science have been 0.36 and 0.08 percent. According to this survey, universities of Tehran, Sharif, Tehran Medical Sciences, Tarbiat Modarres and Shiraz by 9.6, 7.3, 7.0, 6.9 and 6.4 percent of scientific production had the highest contributions among all Iranian academic centers¹³. Aminpour and Kabiri studied the scientific productivity of Isfahan University of Medical Sciences during the 22-years period, from 1985 to 2006 in Web Of Science (WOS) as one of the major databases of

Institute for Information (ISI) and also MEDLINE as the most important bibliographic database in medical sciences. According to this research, there was a sharp increase in scientific publications indexed in MEDLINE and WOS between 2000 and 2006¹⁴.

In the present quantitative research, the number of scientific productions including research projects, books, journal articles and conference proceedings published under the name of Isfahan University of Medical Sciences, were identified. Then, the findings were compared with those reported by Iranian Ministry of Health and Medical Education for the year 1384¹⁵. The main sources for retrieving the related articles were ISI databases and also some of the most high-level medical databases including MEDLINE, EMBASE, Scopus, CINAHL, Chemical Abstract (CA) and Biological Abstracts (BA). Institute for Information (ISI) is a commercial company which over 45 years has been the established leader in providing access to high-value, essential information for researchers and scholars in various fields such as biotechnology, chemistry, engineering, healthcare, higher education and reference information¹⁶. Scientometric tools and indicators maintained by ISI have been greatly used in evaluating research performance of countries, universities and researchers and also in international academic ranking of universities. The academic journals indexed by ISI databases are of great scientific importance. MEDLINE is the most important bibliographic database containing over 13 million records of more than 5400 world's leading biomedical journals published in 70 countries from 1966 to the present. The database has been compiled by the U.S. National Library of Medicine (NLM) and is freely accessible via PubMed. It covers the fields of medicine, nursing, pharmacy, dentistry and health care systems¹⁷. EMBASE is a biomedical and pharmacological database containing over 11 million records from 1974 to the present. It covers more than 5000 biomedical journals from 70 countries¹⁸. Scopus is the largest abstract and citation

database. It covers 33 million records of 15,000 peer-reviewed journals including over 1000 open access journals. The database subject areas are health sciences, life sciences, physical sciences and social sciences¹⁹. The main purpose of this survey was to identify research performance of Isfahan University of Medical Sciences in 1385 and to show the growth of scientific production of this university from 1384 to 1385.

Methods

The present cross-sectional study was performed on scientific production including research projects, journal articles, proceedings and books published under the name of Isfahan University of Medical Sciences during 1385 hijri shamsi (the solar Islamic Iranian calendar) which is almost equal to the beginning of April 2006 till the end of March 2007. Information about published books, research projects and conference proceedings was retrieved by reviewing related archives and documents of Isfahan University of Medical Sciences vice chancellery for research. To identify and evaluate journal articles published by the researchers of this university, several advanced searches were conducted in ISI databases, MEDLINE, EMBASE, Scopus, CINAHL, Chemical Abstract and Biological Abstracts. Time limitation for all searches was set on April 2006-May 2007. Due to the inevitable overlap in journal coverage of different databases with the same scope, one article might be indexed by several databases. In this study, each indexed article was considered once only for the most high-level database. For example, if an article is indexed by ISI, MEDLINE and also EMBASE, it has been considered as an ISI-indexed article.

Results

Table 1 shows the statistics of the approved research projects of Isfahan University of Medical Sciences in 1385. The total number of approved research projects was 1080 of which 666 (61.67%) were descriptive, 165 (15.28%)

were basic science research projects and 121 (11.2%) were clinical trials. Productive research projects had the lowest frequency (only 1 project). Table 2 categorizes 721 journal articles published by the researchers of Isfahan University of Medical Sciences according to the related databases and their original languages during the period of the study. As this table demonstrates, 146 papers were indexed by ISI, 26 papers were indexed by MEDLINE, 194 papers were indexed by EMBASE, Scopus, Biological Abstracts, Chemical Abstracts and CINAHL databases and 318 articles were indexed by other databases. Only 37 articles were published via non-indexed journals. Table 3 classifies all 721 journal articles of Isfahan University of Medical Sciences according to the place of publication. The table indicates that 74.2% of the articles appeared in domestic journals while only 25.8% published in foreign journals. Table 4 compares 726 national and international conference proceedings during 1385. The table shows that the researchers of Isfahan University of Medical Sciences presented 451 papers in national conferences and 275 papers in international conferences during 1385. Two kinds of books published by Isfahan University of Medical Sciences are shown in table 5. From 56 published books, 40 books were edited and 16 books were translated. Figure 1 compares the scientific productivity of Isfahan University of Medical Sciences in 1385 with those reported by Iranian Ministry of Health and Medical Education for the year 1384.

Discussion

Many studies have indicated the significant growth of research performance in Iran and Iranian universities through counting related scientific production in major information databases especially in ISI and MEDLINE^{12,13}. The findings of the present study showed a significant increase (nearly 100%) in all kinds of scientific productions compared to those published in 1384 except the published books.

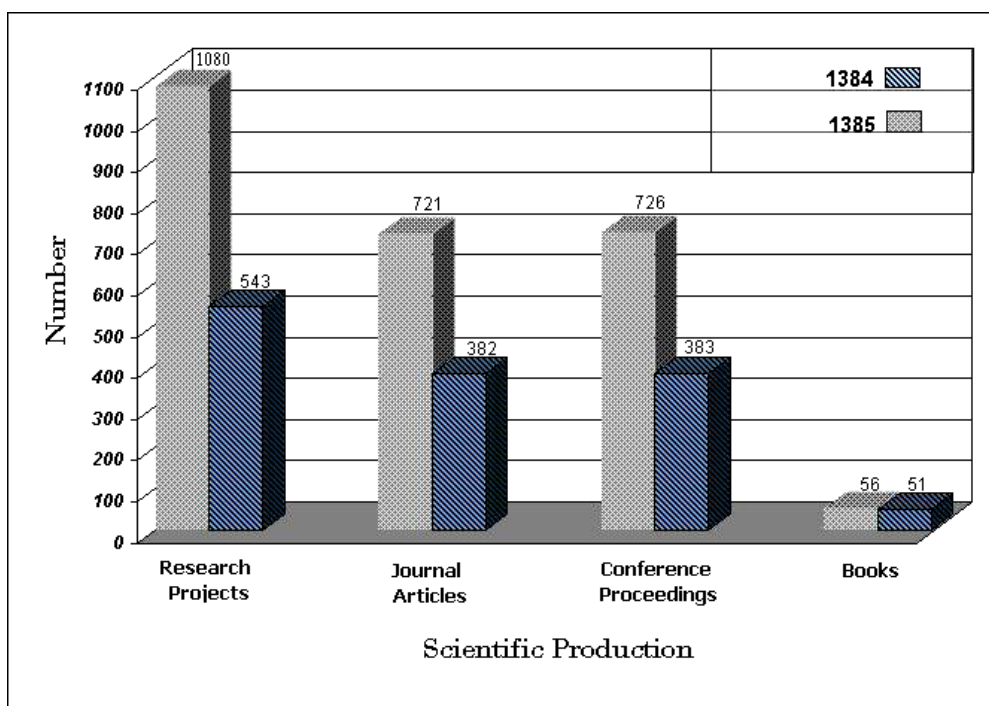


Figure 1. Comparing the scientific productivity of Isfahan University of Medical Sciences in 1384 &1385.

Table 1. Frequency distribution of the university approved research projects in 1385.

Descriptive Projects		Basic Sciences projects		Clinical Trials		Analytic Projects		Hospital-based Projects		Qualitative projects		Interventional projects		Productive projects		Total	
%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
61.67	666	15.28	165	11.2	121	4.26	46	3.52	38	2.04	22	1.94	21	0.09	1	100	1080

Table 2. Frequency distribution of the university articles published in 1385 according to their original languages.

Articles	Articles indexed in ISI		Articles indexed in Medline		Articles indexed in EMBASE, CA, BA Scopus, CINAHL		Articles indexed in other databases		Non-indexed Articles		Total	
	%	n	%	n	%	n	%	n	%	n	%	n
Farsi Articles	-	-	-	-	13.59	98	34.95	252	3.61	26	52.15	376
English Articles	20.25	146	3.61	26	13.32	96	9.15	66	1.52	11	47.85	345
Farsi & English Articles	20.25	146	3.61	26	26.91	194	44.1	318	5.13	37	100	721

Table 3. Frequency distribution of the university articles published in 1385 according to the place of publication.

Articles	Articles indexed in ISI		Articles indexed in Medline		Articles indexed in EMBASE, CA, BA Scopus, CINAHL		Articles indexed in other databases		Non-indexed Articles		Total	
	%	n	%	n	%	n	%	n	%	n	%	n
Domestic Journal Articles	2.08	15	0.14	1	24.69	178	42.58	307	4.71	34	74.2	535
Foreign Journal Articles	18.17	131	3.47	25	2.22	16	1.52	11	0.42	3	25.8	186
Domestic & Foreign Journal Articles	20.25	146	3.61	26	26.91	194	44.1	318	5.13	37	100	721

Table 4. Frequency distribution of the university national & international conference proceedings in 1385.

Proceedings	Number	Percentage
National Conference Proceedings	451	62.12
International Conference Proceedings	275	37.88
Total	726	100

Table 5. Frequency distribution of the university published books in 1385.

Books	Number	Percentage
Edited Books	40	71.43
Translation Books	16	28.57
Total	56	100

Aminpour and Kabiri in their study have confirmed the remarkable increase in scientific publications of Isfahan University of Medical Sciences indexed in MEDLINE and WOS between 2000 and 2006¹⁴. Although the number of the university indexed articles in major databases demonstrated a significant increase in 1385 but the majority of them (318 articles) were indexed in regional or sub-level databases such as IMEMR (Index Medicus for

the Eastern Mediterranean Region) and Index Copernicus, not in high-level databases. Haiqi in his study on research performance in key medical universities in China showed that the coverage of Chinese biomedical publications by western indexing services was very poor¹⁰. The findings of the present study revealed that 74.2% of the journal articles of Isfahan University of Medical Sciences appeared in domestic scientific journals while only 25.8%

were published in foreign journals. This is mainly due to the original language of the most domestic journals, which is Farsi. But the most preferred language of the highly ranked databases and indexing services such as ISI, MEDLINE and EMBASE is English¹⁶⁻¹⁸. Another reason of the strong demand for publishing articles through domestic journals is the fact that submitting articles to the most foreign journals indexed in highly ranked databases is not free of charge and sometimes is really expensive. Saghaei in his editorial discussed the issue of submission to closed access journals. He believes one important factor in favor of open access publishing is the fact that internet technology has resulted in a decrease in publishing costs²⁰. On the other hand, most of the conference proceedings (62.12% in 1385) have been presented in the national conferences by the university researchers. Again, linguistic and financial problems seem to be the main reasons for limited presence in international academic scenes. The significant increase in scientific publications indexed in major databases is greatly due to the several factors including the

university advanced workshops on research methods and paper writing; development of the university computer network and internet services; accessibility of medical databases, electronic journals and full text collections and also financial support of researchers and authors all have been conducted by Vice Chancellory for Research, Isfahan University of Medical Sciences, through the recent years.

Conclusion

Research performance can be evaluated in a region, a country or a university by means of scientometric tools and techniques especially through counting the scientific production. The present study indicated that despite suffering from limitations in annual research budgets and facilities, research performance of Isfahan University of Medical Sciences has appreciably increased during the year 1385.

Acknowledgments

The author would like to thank Dr. Mahmood Saghaei for his valuable comments on an earlier version of this manuscript and Ms Mahboobeh Heydari for her technical support.

References

1. Aminpour F. **An Introduction to Scientometrics**. Isfahan: *Isfahan University of Medical Sciences Publication* 2006.
2. Haiqi Z, Yuhua Z. **Scientometric Study on Research Performance in China**. *Information Processing and Management: an International Journal* 1997; 33(1): 81-89.
3. Braun T, Glanzel W, Grupp H. **The scientometric weight of 50 nations in 27 science areas, 1989-1993. Part II. Life sciences**. *Scientometrics* 1995; 34(2): 207-237.
4. Klaić B. **Analysis of the scientific productivity of researchers from The Republic of Croatia for the period 1990-1992**. *Scientometrics* 1995; 32(2): 133-152.
5. Lewison G, Fawcett-Jones A, Kessler C. **Latin American scientific output 1986-1991 and international co-authorship patterns**. *Scientometrics* 1993; 27(3): 317-326.
6. Narin F, Stevens K, Whitlow E. **Scientific cooperation in Europe and the citation of multinationally authored papers**. *Scientometrics* 1991; 21(2): 313-323.
7. Nederhof A, Noyons E. **International comparison of departments' research performance in the humanities**. *JASIS* 1992; 43: 249-256.
8. Schubert A, Telcs A. **Estimation of the publication potential in 50 U.S. states and in the District of Columbia based on the frequency distribution of scientific productivity**. *JASIS* 1989; 40: 291-297.
9. Yamazaki S. **Ranking Japan's life science research**. *Nature* 1994; 372: 125-126.
10. Haiqi Z. **Research Performance in Key Medical Universities in China Observed from the Scientific Productivity**. *Scientometrics* 1996; 37(1): 177-190.
11. Valadkhani A, Worthington A. **Ranking and Clustering Australian University Research Performance**. *J High Educ Pol Manag* 2006; 28(2): 189-210.

12. Osareh F, Marefat R. **The Growth of Scientific Productivity of Iranian Researchers in MEDLINE.** *Rahyafi* 2005; 35: 39-44.
13. Sabouri A, Poursasan N. **Science Production in 2004.** *Rahyafi* 2005; 34: 60-65.
14. Aminpour F, Kabiri P. **Research Performance in Isfahan University of Medical Sciences.** *11th International Conference of the International Society for Scientometrics and Informetrics.* Madrid, Spain, 2007:25-27 June 2007.
15. **Report on the Research Performance of Iranian Medical Universities in 1384.** 2007. Available from: <http://www.hbi.ir>.
16. **ISI Thomson Scientific.** 2007. Available from: <http://scientific.thomson.com/isi>.
17. Aminpour F. **The ABC's of Internet in Medical Sciences.** Isfahan: *Isfahan University of Medical Sciences Publication* 2007.
18. **EMBASE.** 2007. Available from: <http://en.wikipedia.org/wiki/EMBASE>
19. **Scopus in Detail.** 2007. Available from: <http://www.info.scopus.com>.
20. Saghaei M. **Iran universities contribution to public knowledge: the case of submission to closed access journals.** *JRMS* 2007; 12(4): 159-160.