Original Article

Scientific production of Shahid Beheshti University of Medical Sciences in Web of Science between 2011-2014

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Abstract

Background: Along with the prospers of scientific production, there is a need for the measurement and evaluation of university's scientific productions, using accepted international indices, to make comparisons between academic institutions. The present study aims to evaluate the scientific production of faculty members affiliated with Shahid Beheshti University of Medical Sciences, Tehran (SBMU) in the Web of Science from 2011 to 2014.
Methods: Faculty members of SBMU were selected based on the last updated list of faculty members extracted from the university's Human Resources Management. The evaluation criteria were total number of the articles, total number of the articles between 2011-2014, total article's citations, total article's citations between 2011-14, and H Index extracted from the Web of Science webpage.
Results: Totally, 1300 faculty members were evaluated in the study. Scientific productions had an increasing trend from 2011 to 2014. There had been 6445 article person and 41120 citations with a Mean (SD) of 4.96 (1.22) article participation and 31.63 (122.5) citations to articles which each faculty member had participated in. The mean (SD) H-index of the faculty members was 2.2 (3.2) with the highest faculty member's H-index for the School of Pharmacy with the score 4.9 (3.9).
Conclusion: There has been an increasing trend in the scientific production of SBMU in the Web of Science data base. As Iran is among the first three high ranked countries in Western Asia based on scientometric indices, monitoring of scientific production by yearly intervals seems necessary.

Keywords: Faculty; Iran; Universities

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Introduction

Scientific production in the field of medicine has been growing with an incredible speed in the recent decades. This progress is even more quickly in Iran (1). Along with the prospers of scientific production, there is a need for the measurement and evaluation of university's scientific productions by means of accepted international indices to make comparisons between academic institutions.

Universities can evaluate their research performance using standardized evaluation

indices (2). Assessment of the impact of the research papers in production of knowledge prepares valid documentaries for policy and decision makers in the field of research and enables them to rank different academic institutions in the national and international levels. Further, this gives the research policymakers a view to prioritize research domains to have the most efficacy and the ability of measuring the impact of policy decisions on the scientific output of the university (3).

One of the widely accepted indices is Hirsh Index (H-index), which was introduced by J. E. Hirsch. It is defined as a scholar with an index of h has published h papers each of which has been cited in other papers at least h times (4). Using H-index for scientometric purposes has been recommended in previous studies (5, 6).

The aim of the present study was evaluating the scientific production of the faculty members affiliated with SBMU, in the Web of Science from 2011 to 2014.

Methods

In the present study, faculty members of SBMU comprised the study population. The last updated list of faculty members was prepared by the university's Human Resources Management. All the faculty members were concluded in the study.

The evaluation criteria were total number of the articles, total number of the articles between 2011-14, total article's citations, total article's citations between 2011-14, and H-index extracted from the Web of Science webpage (7).

Search strategy

We searched the full last name and the first name's first letter in the search box. The names affiliated with SBMU were extracted from the Vice-Chancellor office in Administration and Resources Development Affairs of SBMU. Then, the articles and indices were derived and saved in an Excel file. We also extracted each faculty member's designated number.

With regard to the possibility of some names multiple writings, we calculated all the forms of the name spellings for that person.

Data analysis was done using two methods:

1- A research identity of the faculty member: an identity was defined using personal information, total number of articles in the past 4 years, and number of the articles in each year, total number and the number of citations in the past 4 years, number of citations in each year as well as H-index in the Web of Science web page. These statistics revealed the research activities of the faculty members in the past 3 years.

2- Management information: this index was extracted for the university research management unit, the scientific production was calculated for each faculty, and more active faculties were ranked. Finally, research identity of the faculties was designed.

Regarding the possibility of multiple author participation in one article, we used person-article instead of article for the evaluation of faculty member's scientific production.

Data was analyzed using Microsoft Excel and SPSS software 16 (SPSS Inc., Chicago,IL, USA), using descriptive statistics. P values lower than 0.05 were considered as statistically significant.

Results

A total of 1300 faculty members were evaluated in the study. The scientific ranks of the faculty members were as follows: 165 (12.7%) professors, 335 (25.8%) associate professors, 656 (50.5) assistant professor, 112 (8.7%) were instructors, and for the other 30 (2.3%), there was no scientific rank available in the database. Table 1 presents total number, the mean and standard deviation for articles and citations based on years.

In The Web of Science database, 70% of faculty members had at least one article and 70% had an H-index of at least one (Table 2).

Table 3 illustrates Mean (Standard Deviation) for articles based on schools of SBMU, in the Web of Science. School of Pharmacy had the highest number of articles, citations, and H-index (11.4, 67.6 and 4.9 respectively). School of Rehabilitation had the least number of articles and citations (1.2 and 3.3) and the least H-index belonged to School of Nursery and Midwifery (0.6). The scientific publications divided by schools and years is shown in table 4. School of Pharmacy had the highest growth in the number of articles.

Table 1. Mean (Standard Deviation) for scientometric indices of faculty members of SBMU in the Web of Science during 2011-14

		Articles	Citations
2011	Total	1402	7298
	Mean (SD)	1.08 (3)	5.61 (23.05)
2012	Total	1614	9144
	Mean (SD)	1.24 (3.09)	7.03 (30.10)
2013	Total	1646	11011
	Mean (SD)	1.27 (2.85)	8.47 (32.27)
2014	Total	1783	13667
	Mean (SD)	1.37 (3.28)	10.51 (38.43)
2011-2014	Total	6445	41120
	Mean (SD)	4.96 (1.22)	31.63 (122.51)
H-Index	Mean (SD)	2.24 (3.2)	

Table 2. Percentiles for scientometric indices of faculty members of SBMU in the Web of Science during 2011-2014

	Percentiles										
	10	20	30	40	50	60	70	80	90	95	97
Total articles	0	0	0	1	2	3	4	7	13	20	27
Total citations	0	0	0	1	3	6	13	26	72	159	222
Articles 2014	0	0	0	0	0	1	1	2	4	6	9
Articles 2013	0	0	0	0	0	1	1	2	3	5	7
Articles 2012	0	0	0	0	0	1	1	2	4	5	8
Articles 2011	0	0	0	0	0	0	1	1	3	5	7
Citations 2014	0	0	0	0	1	2	5	10	25	50	78
Citations 2013	0	0	0	0	1	2	3	7	20	40	62
Citations 2012	0	0	0	0	0	1	2	5	16	33	53
Citations 2011	0	0	0	0	0	0	1	3	11	28	45
H-Index	0	0	0	1	1	2	2	4	6	8	10

Discussion

The mean H-index of the faculty members was 2.2 in the current study. In another study in SBMU, an H-index of 1.5 was reported for the period from 2009 to mid-2012 (3). Contrary to the trend of scientific production in the country and region, SBMU had had a progressive scientific growth. This finding can be due to the holistic programming in the field of research and its aims, university policies for recruitment and promotion of the faculty members, establishing research centers in the university, increase in scientific funds, and university policies for research management. Hasanzadeh Esfanjani et al. also reported growth of medical scientific production in a 30-year period (1978-2007) (8). This growth in the scientific production was previously mentioned in other studies, too (9,10).

The findings of the current study showed that each faculty member had contributed averagely in five articles with a mean of 31.6 citations to the articles they had published in the period between 2011-14. These numbers were reported to be about 7 articles and 30 citations in Sohrabi et al. during 2009-12, a difference which shows a decrease in the number of articles and an increase in citations. In total, improvement of the indices is observed in all aspects and all faculties affiliated with SBMU (3,11–13).

In a study carried out in the School of Paramedical Sciences, SBMU, the faculty member's H-index was reported to be 0.7. In the current study, H-Index for the same School was found to be 1.5. Although there has been a reduction in the number of faculty members in the School of Paramedical Sciences (No=62), the number of articles has been increased (11).

The comparison between the mean and medians showed an abnormal distribution of faculty member's scientific productions. This abnormality can be interpreted to some extents by the working years of faculty members.

Table 3. Mean (Standard Deviation) for articles, citation and H-index of schools of SBMU, in the Web of Science during 2011-14

Schools	Number of faculty members	Articles	Citations	H-index
		Mean (SD)	Mean (SD)	Mean (SD)
School of Medicine (Faculties of Clinical Disciplines)	678	3.6 (5.9)	21.5 (66)	1.9 (2.5)
School of Medicine (Faculties of Basic Sciences Disciplines)	128	8.1 (10.8)	48.9 (99.4)	3.5 (3.8)
School of Dentistry	133	1.9 (3.3)	8.4 (25.5)	1.2 (1.6)
School of Pharmacy	48	11.4 (10.8)	67.6 (86.5)	4.9 (3.9)
School of Rehabilitation	38	1.2 (2.5)	3.3 (8.9)	0.7 (1.3)
School of Paramedical Sciences	55	3.2 (5.9)	14.8 (32.6)	1.5 (2.1)
School of Public Health	30	5.5 (10.7)	35 (137.8)	2 (2.8)
School of Health, Safety and Environment	20	1.7 (2.3)	5.1 (12.8)	0.8 (1.2)
School of Nutrition	33	10.2 (15.6)	77.2 (235.4)	3.9 (5.2)
School of Nursery and Midwifery	54	1.8 (3.9)	4.4 (14.6)	0.6 (1.2)
Traditional Medicine	10	3.9 (3.5)	15.5 (15.6)	2.2 (1.3)

Table 4. Means (SD) for articles of schools of SBMU, in the Web of Science based on year

Schools	Number of faculty members	2011	2012	2013	2014
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
School of Medicine (Faculties of Clinical Discipline)	678	0.8 (1.78)	0.96 (1.85)	0.9 (1.81)	0.9 (1.65)
School of Medicine (Faculties of Basic Sciences Discipline)	128	1.9 (3.4)	1.7 (2.54)	1.8 (2.9)	2.6 (3.56)
School of Dentistry	133	0.3 (0.74)	0.5 (1.07)	0.6 (1.70)	0.3 (0.74)
School of Pharmacy	48	1.4 (1.82)	2.7 (3.14)	3.5 (3.59)	3.6 (3.60)
School of Rehabilitation	38	0.2 (0.54)	0.3 (1.12)	0.2 (0.65)	0.3 (0.84)
School of Paramedical Sciences	55	0.6 (1.41)	0.9 (1.79)	0.8 (1.79)	0.7 (1.90)
School of Public Health	30	1 (2.34)	1.3 (2.80)	1.3 (3.61)	1.7 (3.52)
School of Health, Safety and Environment	20	0.3 (0.74)	0.25 (0.63)	0.5 (0.88)	0.5 (1)
School of Nutrition	33	0.6 (3.61)	2.3 (4.17)	3.2 (4.65)	3 (4.44)
School of Nursery and Midwifery	54	0.29 (0.94)	0.4 (1.09)	0.3 (1.10)	0.6 (1.77)
Traditional Medicine	10	0.3 (0.94)	1.2 (1.03)	1.5 (1.43)	0.9 (0.87)

Using H-Index is shown to be an appropriate method to evaluate researcher's function. On the other hand, Van Raan believes that this scientometric index is not appropriate. Underestimation can be due to incorrect spelling of the name of the authors as a result of poor English language scientific writing skills in non-English speaking countries and also in case of multiple authors (14). Naderi et al. in another study, showed differences for recording of the names with more than two parts as a result of the diversity of the author's information (15).

The current study was an analytical scientometric one based on the Web of Science database, while the previous scientometric studies were carried out using the information of the Scopus website (9,16,17).

One important limitation of the current study was different English spelling of Persian names. We tried to resolve this problem by searching all possible spellings. Lack of a unique profile for the researcher in the Web of Science was another limitation, which may have caused underestimation of the researcher's articles.

There has been an increasing trend in the scientific production of SBMU in the Web of Science database. As Iran is one of the three high ranked countries in the Western Asia based on scientometric indices (18), monitoring of scientific production by yearly intervals seems necessary. Assessing the trends of scientific production can help us for future planning and determining possible progress of the university.

Conflict of interest

Authors declare no conflict of interests.

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