

A survey of scientific production and collaboration rate among of medical library and information sciences in ISI, scopus and Pubmed databases during 2001-2010

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ABSTRACT

Background: Research is essential for development. In other words, scientific development of each country can be evaluated by researchers' scientific production. Understanding and assessing the activities of researchers for planning and policy making is essential. The significance of collaboration in the production of scientific publications in today's complex world where technology is everything is very apparent. Scientists realized that in order to get their work widely used and cited to by experts, they must collaborate. The collaboration among researchers results in the development of scientific knowledge and hence, attainment of wider information. The main objective of this research is to survey scientific production and collaboration rate in philosophy and theoretical bases of medical library and information sciences in ISI, SCOPUS, and Pubmed databases during 2001-2010. **Materials and Methods:** This is a descriptive survey and scientometrics methods were used for this research. Then data gathered via check list and analyzed by the SPSS software. Collaboration rate was calculated according to the formula. **Results:** Among the 294 related abstracts about philosophy, and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010, the year 2007 with 45 articles has the most and the year 2003 with 16 articles has the least number of related collaborative articles in this scope. "B. Hjørland" with eight collaborative articles had the most one among Library and Information Sciences (LIS) professionals in ISI, SCOPUS, and Pubmed. Journal of Documentation with 29 articles and 12 collaborative articles had the most related articles. Medical library and information science challenges with 150 articles had first place in number of articles. Results also show that the most elaborative country in terms of collaboration point of view and number of articles was US. "University of Washington" and "University Western Ontario" are the most elaborative affiliation from a collaboration point. **Conclusion:** The average collaboration rate between researchers in this field during the years studied is 0.25. The most complete reviewed articles are single authors that included 60.54% of the whole articles. Only 30.46% of articles were provided with two or more than two authors.

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Key words: Collaboration, collaboration rate, ISI databases, medical library and information science, Pubmed databases, scientometrics, SCOPUS databases

Access this article online

Quick Response Code:



Website:
www.jehp.net

DOI:
10.4103/2277-9531.117419

INTRODUCTION

One of the most important aspects of development in each country is the production of scientific information. Information is power and countries were powerful that have developed the production of scientific information.

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This article may be cited as: Yousefy A, Malekhamadi P. A survey of scientific production and collaboration rate among of medical library and information sciences in ISI, scopus and Pubmed databases during 2001-2010. J Edu Health Promot 2013;2:47.

Indeed, this development influenced the other aspects of development, including economic, social, and cultural development. Abdul Salam said that the “standard of living of a nation depends on the nation’s science and technology.”^[1]

There is also a direct relationship between production of scientific and economic development. Indeed, it is clear that the classifications of countries are based on economic development and based upon their level of participation in science. Increasing interdisciplinary fields of science makes the science of the world even more dynamic in recent decades. Therefore, researchers in any scientific field do not have the ability to perform other activities, so they tends to co-operation to use each other’s expertise.^[2] One of the observations in the field of scientific communication has been well documented is less tends to individually work on their research activities.^[3] Decreased activities of individual scientific works and increasing group papers that widely used in many scientific disciplines has been mentioned, so that the group works in many scientific fields make up the majority of publications.^[4]

In the world of science, articles published in international journals in every field are the most important ways of informing and growth of knowledge. Professional journal articles reflect the views and the latest scientific achievements in any field. From this perspective, the scientific co-operation is not the research quality, but quality is a means to achieve it. The main purpose of this study is to determine the most important authors, magazines, countries, institutions, research centers and collaboration rate in philosophy and theoretical bases of medical library and information sciences in ISI, SCOPUS, and Pubmed databases during 2001-2010.

The research questions are:

1. Who are the most important authors of the papers as the number of articles and the collaborative works in philosophy and theoretical bases of medical library and information sciences in ISI, SCOPUS, and Pubmed databases during 2001-2010?
2. What are the most important journals as the number of articles and the collaborative works in philosophy and theoretical bases in medical library and information sciences in ISI, SCOPUS, and Pubmed databases during 2001-2010?
3. What are the most important countries as the number of articles and the collaborative works in philosophy and theoretical bases in medical library and information sciences in ISI, SCOPUS, and Pubmed databases during 2001-2010?
4. What are the most important institutions and affiliations as the number of articles and the collaborative works in philosophy and theoretical bases in medical library and information sciences in ISI, SCOPUS, and Pubmed databases during 2001-2010?
5. How is the co-operative group of writers in philosophy

and theoretical bases in medical library and information sciences in ISI, SCOPUS, and Pubmed databases during 2001-2010 in different years distributed?

6. What is the collaboration rate among philosophy and theoretical bases in medical library and information sciences in ISI, SCOPUS, and Pubmed databases during 2001-2010?

Sengupta studies about scientific production in the scope of nerve sciences. Subjects in this study were based on the 5785 journals cited by the journal “an annual study of nerve” as a core journal. The results showed that, despite the close relationship between biomedical field with the field of neurological sciences, biochemistry topic in neuroscience research has fewer partnership (8.8). Bradford distribution rule in this study has been approved.^[5]

Gomez *et al.* in a paper entitled “Patterns of co-operation in the fields of Spanish scientific publications on various topics” are trying to find about these patterns. Exploring 43,402 Spanish papers published in 1990 and 1993 for each of the scientific fields a range of indicators such as the internationalization of scientific research, collaboration, organizational level, the amount of co-writing were measured. The results indicate the pattern with the high dispersion in indicators.^[6]

Osareh and Wilson’s research, entitled “Co-operation in the scientific publications of Iran” explores the international co-operation to investigate scientific publications in Science Citation Index (SCI) during the years 1995-1999. The results show the highest scientific co-operation with the USA. The busiest author with 94 (8/18%) articles and the most cited author in with 290 citations (44/6). University of Shiraz, Tehran, Sharif industrial have the most articles and chemical topics are the highest produced articles with 393 events (71/9%), the next highest number of articles and topics are in analytical chemistry, chemistry and chemical engineering in rank.^[7]

Wilson and Osareh in the other research entitled “Science and Research in Iran: A Scientometric study” has done science and technology publishing scientometric analysis of 7-year period in four periods 1975-1981, 1988-1982, 1995-1989, 1996-2002 in SCI. The growing trend of publications from 0/02% in 1985 to 0/23% in 2002 (with an approximate growth) is reached from the research. In all four courses, the United States has the highest rating in the collaboration in the first, about topic rankings veterinary medicine, pharmacology and pharmaceuticals, chemistry and organic chemistry are the highest share.^[8]

Belinchon *et al.* in the research “the contribution of countries in producing scientific articles on skin diseases during the years 1987-2000” have been using the Medline database. In all 19,255 articles in 32 journals the countries which produced the largest share belonged to England (7/26%), Germany (7/16%), Italy (5/11%), and France (2/9%) respectively. In proportion

to the population of articles published per country per 1 million population, average 9/51 article published reiterated that the European countries, Denmark (0/164 articles per million inhabitants), Sweden (7/127), and Finland (6/119) respectively have the highest rank. In total, 9/53% of articles have been published in six of the British Journal of Skin Diseases with a 2779 article (4/14%) has the highest number of article sites.^[9]

Marshkova-shaikevichusing Social Sciences Citation Index database is collaborating in 2002 bibliometric analysis of 10 candidate countries for membership. More publications in the field of economics, business, sociology, psychology, psychiatry, (social aspects) and political science estimated.^[10]

Ho's research is based on Social citation Index (SCI) data on issues of environmental engineering, environmental science and water resources in the period 1991-2004 was performed. However, the results show that 5.7% of articles were never invoked. Nine articles of 20 cited articles belongs to the Water Research.^[11]

Osareh in an article entitled "Co-operation between Iran and the UK higher education and research" investigated the co-operation between Iran based on the findings of previous research. Years 1985 and 2003, United States was the first and Britain was the second most of any major country has had scientific co-operation with Iran.^[12]

Jonkers and Tijssenbegan were investigating the scientific and international co-operation and Research. The natural scientist from China who was studying abroad and returned to their country is the research community. They also examined the date of departure of this research, joint scientific output and international co-operation were examined. They believe that a significant relationship between scientific outputs, levels of international co-operation, and personality characteristics of this group of researchers. They also find that the Chinese scientists that return home had not have the motivation research that they have before.^[12]

MATERIALS AND METHODS

This is a descriptive survey with scientometrics method that used for this research. Data gathered via checklist and analyzed by the SPSS software, among the 294 related abstracts about philosophy and theoretical bases of medical library and information sciences in ISI, SCOPUS, and Pubmed databases during 2001-2010. Checklist validity is confirmed by experts of library and information sciences. For gathering information, the checklist with the following items was prepared: The article, authors, journal name, author studies, country name, organizational affiliation, participation rates, and the number of articles. Eight scopes of philosophy and theoretical bases of medical library and information science prepared by the medical library and

information science experts and add to the phrase "medical library and information science," then limited to the years 2001-2010, limit the document type to journal articles, and finally, the results are analyzed.

In this study, descriptive statistics was used. The collaboration rate calculated as below:^[4]

$$cc = 1 - \left\{ \sum_{j=1}^k \left(\frac{1}{j} \right) \times \frac{F_j}{N} \right\}$$

In this formula:

F_j = Number of articles written by j authors

j = Articles written by (1 author, 2 authors, 3 authors, etc.)

N = The total number of published writtenarticles

K = The largest number of authors in a paper.

RESULTS

In this part we answered the research questions. Table 1 shows the frequency distribution of the busiest writers and editors working with the highest collaboration in philosophy and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010. HJORland and Buschman with eight and five articles are the most active authors in the field of philosophy, and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010 [Table 1].

About the second question, "Journal of Documentation," "Library Trends," and "Library Quarterly" are the most active journals in number of articles in the field of philosophy, and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010 [Table 2].

About the collaboration between authors in the articles "Journal of Documentation," "Library Trends," and "New library world" are top journals about collaboration in the field

Table 1: The frequency distribution of the busiest writers and editors working with the highest collaboration of philosophy and theoretical bases of medical library and information sciences in ISI, SCOPUS, and Pubmed databases during 2001-2010

Name of author	Number of written articles				
	1 author	2 authors	3 authors	4 authors	More than 4 authors
HJORland	8	-	-	-	-
Buschman	5	-	-	-	-
Ocholla	2	1	1	-	-
Wiston	1	2	-	-	-
Overall	1	2	-	-	-
Virkus	1	-	-	-	1
Blumel	-	2	-	-	-
Onyancha	-	1	1	-	-

of philosophy, and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010.

About the third question, “United States of America,” “United Kingdom,” and “Australia” are the most active countries in number of articles in the field of philosophy, and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010. “United States of America,” “Australia,” and “Canada” are the most active countries about collaboration in this field of study [Table 3].

About the most active institutions and affiliations in the field of philosophy, and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010, as the number of articles “University of Washington,” “University Western Ontario,” and “University of Pittsburgh” are the most active affiliations and as the collaboration are “University of Washington,” “University Western Ontario,” and “University of Pittsburgh [Table 4].”

About the other question, between 294 articles, 178 articles (60.54%) are written by single authors and 117 articles (30.46%) are written collaboratively. Tendency to written articles with 1, 2, 3, 4 and more than 4 authors vacillate during different years, but the tendency in writing

articles with 2 and 3 authors is relatively enhanced through 2001-2011 [Table 5].

About the collaboration rate between authors with the collaboration rate formula, the Table 6 shows that the collaboration rate between authors has a vacillation process during the years. The most collaboration rate is in 2009 (0.33%) and the least collaboration rate is in 2004 and 2006 (0.16%). The total collaboration rate is 0.25 [Table 6].

CONCLUSION

This research gives a general schema of science production and collaboration between authors in the scope of philosophy and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010. Between the 294 articles, 851 authors worked together. “Hjorland B.,” “Buschman J.,” and “Ocholla D.N.” are top three authors. “United States of America,” “United Kingdom,” and “Australia” are the most active countries in number of articles in the field of philosophy, and theoretical bases of medical library and information science in and Pubmed databases during 2001-2010. “United States of America,” “Australia,” and “Canada” are the most active countries about collaboration in this field of study. About the most active institutions and affiliations in the field of

Table 2: Distribution and percentage of the busiest journals in philosophy and theoretical bases of medical library and information sciences in ISI, SCOPUS, and Pubmed databases during 2001-2010

Journal name	Number of written articles					Sum	Percentage
	1 author	2 authors	3 authors	4 authors	More than 4 authors		
Journal of documentation	17	4	2	3	3	29	9.8
Library trends	13	8	2	1	-	24	8.1
Library quarterly	15	2	2	1	-	20	6.8
Information research	2	6	1	2	-	11	3.7
Library and information science research	2	1	1	1	-	5	1.7
New library world	-	3	1	-	1	5	1.7
Journal of medical library association	-	-	1	2	1	4	1.3
Medical reference services quarterly	-	2	1	-	-	3	1
Library Hi Tech	-	3	-	-	-	3	1

Table 3: The frequency distribution of the busiest states in terms of number of papers and participation in philosophy and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010

Country name	Number of written articles					Sum
	1 author	2 authors	3 authors	4 authors	More than 4 authors	
United States of America	53	23	8	8	6	100
United Kingdom	12	3	3	-	-	18
Australia	6	3	4	4	1	18
South Africa	7	2	2	1	-	12
Canada	5	2	2	1	1	11
England	3	-	1	2	1	7
Spain	1	2	-	2	-	5
Germany	-	1	1	-	1	3
Iran	-	1	2	-	-	3
Sweden	-	2	-	1	-	3

Table 4: The frequency distribution of the busiest affiliations in terms of number of papers and participation in philosophy and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010

Affiliations	Number of written articles					Sum
	1 author	2 authors	3 authors	4 authors	More than 4 authors	
University of Washington	2	3	1	-	-	6
University Western Ontario	-	-	1	1	1	3
University of Pittsburgh	-	2	-	-	1	3
University New S Wales	-	2	-	-	-	2
Florida State University	1	-	1	-	-	2
University Maryland	-	-	1	-	1	2
University of Zululand	-	1	1	-	-	2
TBI	-	2	-	-	-	2
Department of political science	2	-	-	-	-	2

Table 5: The frequency distribution of participation in philosophy and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010

Affiliations	Number of written articles					Sum
	1 author	2 authors	3 authors	4 authors	More than 4 authors	
2001	2	-	2	4	15	23
2002	1	3	1	5	9	19
2003	1	1	-	4	12	16
2004	1	2	2	3	13	21
2005	3	-	1	5	24	33
2006	2	-	1	4	23	30
2007	-	-	5	9	31	45
2008	-	4	4	11	22	41
2009	6	2	8	6	14	36
2010	-	2	3	9	15	29
Sum	16	14	27	60	178	294
Percentage	5.4	4.7	9.1	20	60	100

philosophy, and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010, as the number of articles “United States of America,” “Australia,” and “Canada” are the most active affiliations and as the collaboration are “University of Washington,” “University Western Ontario,” and “University of Pittsburgh.” “Journal of Documentation,” “Library Trends,” and “Library Quarterly” are the most active journals in number of articles in the field of philosophy, and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010. About the collaboration between authors in the articles “Journal of Documentation,” “Library Trends,” and “New Library World” are top journals about collaboration in the field of philosophy, and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010. About 60% of articles are written by only one author and the remaining written by two or more than two authors. About the collaboration rate between authors with the collaboration rate formula, the Table 6 shows that the collaboration rate between authors has a vacillation process during the years. The most collaboration rate is in 2009 (0.33%) and the least

Table 6: The collaboration rate between authors in the articles of philosophy, and theoretical bases of medical library and information science in ISI, SCOPUS, and Pubmed databases during 2001-2010

Year	Collaboration rate
2001	0.3
2002	0.7
2003	0.2
2004	0.16
2005	0.2
2006	0.16
2007	0.27
2008	0.17
2009	0.33
2010	0.19
Average	0.25

collaboration rate is in 2004 and 2006 (0.16%). The total collaboration rate is 0.25. This collaboration rate is medium and in the range of other research occurred in scientometrics before. It shows that although collaboration rate is to be growing following the years, but this rate grows very slow, maybe because collaboration’s philosophy and benefits are not realized appropriately.

REFERENCES

1. Garfield E, Soren WP, Wolfgang S. HistCited™: A software tool for informatics analysis of citation linkage. *Inf Praxis* 2006;1:391-400.
2. Osareh F. Higher education research collaboration between Iran and UK. In Proceedings of COLLNET Meeting Extra Session in Conjunction with 10th ISSI Conference on Scientometrics. Stockholm, Sweden: Proceedings of COLLNET Meeting; 2005 July 28.
3. Katz JS, Martin BR. What is research collaboration? London: ERSRC Center for Science, Technology, Energy and Environment; 1995. p. 95.
4. Osareh F. Collaboration in astronomy knowledge production: A case study in science direct from 2000-2004. In Proceedings of 10th International Conference on Scientometrics and Informetric. Stockholm, Sweden: Proceedings of 10th International Conference on Scientometrics and Informetric; 2006 July 24-28.
5. Sengupta IN. The growth of knowledge and literature in neuroscience. *Scientometrics* 1989;17:253-88.
6. Gomez I, Fernández TM, Méndez A. Collaboration patterns of Spanish scientific publication in different research areas and disciplines.

- Presented of Proceedings of the 5th Biennial International Conference of the International Society for Scientometrics and Infometrics Learned Information. Medford NJ, ETATS-UNIS; 1995 Sep 6-10.
7. Osareh F, Wilson CS. Collaboration in Iranian scientific publications. *Libri* 2002;52:88-98.
 8. Wilson CS, Osareh F. Science and research in Iran: A scientometrics study. *Interdiscip Sci Rev* 2003;28:26-37.
 9. Belinchon I, Ramos MJ, Sanchez-Yus E, Betloch I. Dermatological scientific production from European union authors. *Scientometrics* 2004;2:271-81.
 10. Shaikovich IM. Scientific collaboration of new 10 EU countries in the field of social sciences. *Inf Process Manag* 2006;42:1592-8.
 11. Ho YS. Bibliometric analysis of biosorption technology in water treatment and from 1991 to 2004. *Int J Environ Pollut* 2008;34:1-13.
 12. Jonkers K, Tijssen R. Chinese researchers returning home: Impacts of international mobility on research collaboration and scientific productivity. *Scientometrics* 2008;77:309-33.

Source of Support: Nil, **Conflict of Interest:** None declared