

## Survey on authors' collaboration rate and citation behaviors in JRMS articles during 2004-2006

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### Abstract:

Information has a big portion in the success of every research system. Although journals are the main resources for researchers, the increasing price and number of them have made difficult duties for libraries in providing information needs. Citation analysis is a useful tool for evaluating the range of library materials' usage; on the other hand collaboration and producing scientific publications is a routine process in most of academic fields. Researchers' collaboration causes the development of scientific works and achieves more results. The importance of collaboration in scientific papers is especially clear in today's complex world since every thing is based on knowledge. The evidences show the importance of quality and even quantity of scientific productions in case of collaboration.

This research analyzed medical sciences articles in JRMS and compared collaboration rate and the citation behaviors of these articles' authors during 2004-2006. Then determined the most cited journals. This research was an analytical study using citation analysis method and collaboration rate formula. The data gathering method was taking notes from the resources and title pages of these articles.

The results of the research revealed that 235 articles had 4064 citations taken of them; the average number of citations for each article was 17.29. The Bradford Law

came true with the journals used by articles' authors and there were three most cited journals in the analyzed articles. Authors of the articles, in total, had the most range of using journals with 85.95 percent citation and least range of using thesis with 0.3 percent citation. The half-life of the cited resources was as follow: articles = 6.6 years, books = 6.2, theses = 7.8 years, journals and proceedings = 8.7 years and the electronic resources = 1.7 years.

The authors' collaboration rate in 2004 was 0.49, in 2005 was 0.57 and in 2006 was 0.59. The average of authors' collaboration rate during 2004-2006 was 0.55. This paper indicated that the collaboration rate has been improving.

**Keywords:** Collaboration rate, Citation analysis, Articles, Medical Science, Isfahan University of Medical Sciences (IUMS), JRMS

### 1 Introduction:

It's essential to access information effectively for succession in every research system. Books, research reports, dissertations, conferences, proceedings and scientific journals are the main information resources for researchers, and scientific journals are the most valuable among them. University libraries usually confront with financial problem in acquisition as the number and

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price of journals are increasing.

Edwards (1999) indicated that prices have risen rapidly for over than 20 years and have been more; since 1980's every year 15 to 30 percent. These conditions have made many challenges for university libraries to fulfil their user's resource needs.

One of the methods to identify the scientific value of an article is how many it is cited; that is the most important criteria to evaluate a scientific work. Citation and analysis is one of the bibliometric methods, which evaluate scientific literatures by counting citations of an article.

**Citation analysis** A bibliometric technique in which works cited in publications are examined to determine patterns of scholarly communication, for example, the comparative importance of books versus journals, or of current versus retrospective sources, in one or more academic disciplines. The citations in student research papers, theses, and dissertations are also examined by librarians for purposes of collection evaluation and development. (ODLIS)

Omran(2007) believes that citation analysis help researchers. A researcher can improve him/her self through claiming citations and recognizing whether his/her statements are approved by others or not.

Improvement of computer technology is one of the main effective factors on bibliometric studies consisting citation analysis.

According to Ratnatunga and Romano (1996) citation analysis has some important objects consisting: Faculty and PhD courses evaluation, comparative citation studies, effectiveness of research in a major, and the study of journals effect.

If librarians identify core journals, they can subscribe fewer journals which have more readers and more effect, so make the most of money and space in libraries. On the other hand there are evidences about the relationship between collaboration rate and quality of articles, that means the more number of authors cause the more qualified

articles. To study the collaboration among researchers is essential for strategic planning and research policy in major, also Iranian medical researchers can improve their scientific value of articles by collaboration and have them published in national and international approved journals.

This paper analyzed the citations of JRMS articles during 2004-2006 to help the acquisition through achieving the most cited medical journals. The main goal of this research is to identify the authors' collaboration rate and citation behaviours in JRMS articles during 2004-2006 and the other objects are: to identify the mean range of citations in every article, the collaboration rate, the most cited journals and the half life of information resource in medical science.

## 2 literature review:

Citation analysis in published journals of different subjects can reveal the advantages and disadvantage of journals, the most cited journals, resources variation, half life of citations, and so on. There are different researches in this area:

Khamoushian(2000) states that among 408 dissertation of M.D courses in 1992-1996 there were 4676 citation which 54.7% had cited books,(the most one).

Abdulmajid( 2004) has a research in library and information science area. He studies 553 articles and 6573 citations.

The mean number of citations for each article was 12.5. Also collaboration rate was surveyed. 81.92% of articles have been written by just one author.

Danesh et al (2007) reviewed 138 research projects of 617 medical researchers during 2001-2006 and determined that collaboration has been 4.47 authors for each paper.

Faraj pahlou (2004) has a research titled" the collaboration rate among library and information science specialist" which studied 168 articles in this area. Just 23 articles had been written by more than one author.

Asnafi et al (2007) studied library and in-

formation science during 2000-2006. 41 papers had just single author and 21 had more.

### 3 Data:

The type of research is descriptive surveys. Consisting two stages: citation analysis was the first one and the identifying collaboration rate was the second.

Collaboration Coefficient was calculated according to the following formula:

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

F<sub>j</sub>= the number of articles with “j” author  
J= articles (one author, two authors, three authors...)

N= the whole number of authors in an article (12).

The population of this study comprises all 235 articles of JRMS consisting 4064 citations during 2004 – 2006.

**Table1:** frequency distribution of articles and citations in JRMS according to publication year

Distribution frequency of the citations articles in journals and the mean value of 235 articles have published during 2004 – 2006 which have 4064 citations. This means that each article has 17.29 citations in average. Also there are differences among these 3 years such as: the most number of citations is in 2006 (1553 ones) and the least is in 2004 (1229). Also the mean of citations for each article is 18.27 in 2006 and 16.03 in 2004.

**Table2:** frequency distribution of the articles from the collaboration rate point of view

authors	One autho	Two autho	Three	Four autho	More	sum
2004	9	25	22	11	3	70
2005	6	25	38	9	2	80
2006	8	25	29	18	5	85
total	23	75	38	38	10	235
percent	9.79	31.91	37.87	16.17	4.26	100

	number articles	percentage	citations	percentage	mean
2004	70	29.79	1229	30.24	17.56
2005	80	34.04	1282	31.55	16.03
2006	85	36.17	1553	38.21	18.28
total	235	100	4064	100	17.29

According to table 2 there are 235 articles which 23(9.79%) of them has 1 author and the most articles are those with 3 authors (37.87%).

**Table3:** collaboration rate during 2004 – 2006

year	Collaboration rate
2004	0.49
2005	0.57
2006	0.59
mean	0.55

Collaboration rate is a number between 0 and 1. the more it is bigger than 0.5. The better is the collaboration rate among authors, and when it is near 0, means that

authors have a weak collaboration. As it is obvious in table3 the mean during 2004-2006 is 0.55 which shows the average rate among authors.

**Table6:** ranking of highly cited journals.

Article title	rank	of citations
The Lancet	<b>1</b>	<b>67</b>
stroke	<b>2</b>	<b>61</b>
Anaesthesia and analgesia	<b>3</b>	<b>54</b>
New England journal of medicine	<b>4</b>	<b>54</b>
Circulation	<b>5</b>	<b>35</b>
Journal of Urology	<b>6</b>	<b>33</b>
Fertility and Sterility	<b>7</b>	<b>32</b>
Journal of American College Cardiology	<b>8</b>	<b>30</b>

#### **Determination of the highly cited journals:**

All citations have counted, 1239 journals were cited among 2493 citations to jour-

nals. Then the citations categorized and based on Bradford's law the highly cited journals determined.

**Table7:** frequency distribution of different sources during 2004-2006

source	book		Journal		dissertation		Conferences item		Electronic source		others		total	
	number	Percentage	number	Percentage	number	Percentage	number	Percentage	number	Percentage	number	Percentage	number	Percentage
2004	166	13.51	1027	83.56	6	0.49	18	1.46	7	0.57	5	0.41	1229	100
2005	175	13.65	1061	82.76	3	0.23	6	0.47	19	1.48	18	1.4	1282	100
2006	137	8.82	1405	90.47	3	0.19	1	0.06	6	0.39	1	0.06	1553	100
total	478	11.76	3493	85.95	12	0.3	25	0.62	32	0.79	24	0.59	4064	100

According to table 7, it is seen that 85.95% of citation concern with journals, 11.76% with books, and 0.79% with electronic resources. 0.62% with conference proceedings. 0.59% with other resource and 0.3% with dissertations.

#### 4 Half life of citations:

The time between journal's article publishing date and citing references date of that article is named citation's half life. This time determines how old or new are the cited information. After statistical analysis findings are as follow:

Books have a 6.2- year half life during 2004-6, journals have a 8.9-year half life, dissertations 7.8- years, conference proceedings 8.7- year, and other resources 6.5-years.

#### 5 Conclusion:

Findings showed that there were 4064 citations in 235 articles; it means that the average number of citations is 17.29 for each one.

Different results were found in previous researches. Yang and pan (2006) found it 15.3 in hormonology area, khamoushian(2000) found it 11.46 in M.D courses, siamian et al (2006)

11.8 citation in general and special medicine.

So the author JMRS have more references in their article compare with others. The present research revealed the collaboration rate 0.55% in other word just 9.79% of articles have one authors. It is a good collaboration rate relatively and means the Iranian medical researchers know the value of the teamwork to produce an article.

Danesh et al(2007) found this rate 0.26 about the highly cited journals , result indicated that Bradford's law followed and 8 journals found as the highly ones.

These journals are very important both for medical researchers and for librarians in order to have a good acquisition.

Different kind of sources were used by authors, the most one were journals with 85.95%. then books with 11.76%. Previous studies have similar results: abdulmajid et al(2007) found the most cited sources journals too with 38.75%. So researchers prefer to cite the scientific journals. About half life of cited sources results showed that 6.6 year in average. Afshar (1997) found it 6.3 year in nursing literatures. Siamian (2007) found it 5 year in medicine. As the different papers have similar findings. It is concluded that medical researchers prefer to use up to date sources to write their articles.

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