

May 2019

Relationship between the Usage Count and the Number of Citations in the Journals of Library and Information Sciences: The Case of Access Type

Leila Nemati-Anaraki Associate Professor in Librarianship and Medical Information Department
School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran,
nematianaraki.l@iums.ac.ir

Maryam Zarghani
Iran University of Medical Sciences, mary.zarghani@gmail.com

Forouzan Ashoori-Mehranjani
Iran University of Medical Sciences, forouzan.ashoori@gmail.com

Soheila Eshaghi-Kopaei
Iran University of Medical Sciences, soheila.e2000@gmail.com

Follow this and additional works at: <https://digitalcommons.unl.edu/libphilprac>

Part of the [Library and Information Science Commons](#)

Nemati-Anaraki, Leila Associate Professor in Librarianship and Medical Information Department; Zarghani, Maryam; Ashoori-Mehranjani, Forouzan; and Eshaghi-Kopaei, Soheila, "Relationship between the Usage Count and the Number of Citations in the Journals of Library and Information Sciences: The Case of Access Type" (2019). *Library Philosophy and Practice (e-journal)*. 2376.
<https://digitalcommons.unl.edu/libphilprac/2376>

Relationship between the Usage Count and the Number of Citations in the Journals of Library and Information Sciences: The Case of Access Type

Abstract: Nowadays, the open access movement has become one of the most effective to make up-to-date information accessible to users. This study aimed at examining the relationship between the usage count and the number of citations of library and information sciences articles emphasizing on access type and the study used document analysis and scientometrics based on journals in the Web of Science. Open-access journals (six journals with 60 articles) and non-open access journals (ten journals with 100 articles) were selected. The www.simagojr.com site was checked to get ensured about the field of journals. The findings indicated among openaccess journals, “Information Research-An International Electronic Journal”and “Information Technology and Libraries” were the oldest and had the highest number of articles. The average number of citations was related to Transinformacao (3.3) and Journal of the Medical Library Association (112.4). The use of open access journals varied between 10.1 (Information Research) and 17.9 (Revista Espanola de Documentacion Cientifica) since 2013. Accordingly, there was no significant relationship between the usage countof the articles in open access journals and the number of citations. Among the non-open access journals, the“International Journal of Information Management” was the oldest. The average number of citations was between 120.1 for the “International Journal of Information Management” and 709.4 for”Information System Research”. The extent of using non-open access journals varied between 26.1 for “Journalofthe American Medical Informatics Association” and 181 for the “Journal of Computer -Mediated Communication”.There was significant relationship between using the articles in non-open access journals and the number of citations. The total correlation for open-access journals and non-open access journals were 0.23 and 0.40, respectively. The correlation for each journal of any access type was weak to strong.

Keywords: citations, library and information science, open access, subscription based journals, usage

Introduction

In the information era, scientific and technical development have led to the publishing and sharing information, results, methods, products, and new procedures for any type of scientific and research activity. This sharing and exchange at the local, national, and international level is done both formally and informally (Seo et al. 2016). In informal channels, scientific products are disseminated through personal contacts, e.g. personal letters, electronic mails, negotiations and conferences. In formal channels, scientific works are disseminated by the authors after being handed in and undergoing a referral and professional examination in the form of scientific journal papers and monographs. They are then distributed to the scientific community through libraries and web- and internet-based retrieval systems (Saadat 2008). Taking into account the expansive developments in the field of library and information sciences and identifying the main lines of research and methods of accessing information, a model of

citations for the open access and subscription access journals were considered (Nieder, Dalhaug, and Aandahl 2013).

The significant increase in the great amount of information provided calls for a source which can readily present the researchers and those in need of information with up-to-date information (Asnafi 2009). Nowadays, the open access movement is considered as one of the most influential, with the aim of making up-to-date information accessible to the users in libraries. This movement has had a tremendous impact on the way information and scientific findings have been created and presented in all areas of knowledge (Saadat and Shabani 2009) and has replaced traditional and subscription-based sources (Peekhaus and Proferes 2016).

The term open access means having free access to the internet content, where any user can download, copy, distribute, print, search or even get a link to the full-text article after reading (Masrek and Yaakub 2015). Within the past few years, this issue has become a controversial one (Asnafi 2009) among librarians, researchers and publishers and has turned into the domain of research communications and the locus of publishing scientific texts. Today, a considerable proportion of scientific texts are available in the form of open access journals. Hence, one of the channels to access scientific publications is open-access journals resulting from the development of the internet and World Wide Web and their number is increasing. While the cost of subscribing to scientific journals is permanently increasing all over the world each year and it is considered as one of the main obstacles in accessing scientific findings, presenting a model for having open access to information and the distribution of open access journals has attracted the attention of academic and research communities (Saadat 2008). One of the advantages of having open access is the increasing number of citations and research impact with regard to the greater visibility of these types of publications through the world wide web, free access to the scientific and research information in the form of electronic journals (Masrek and Yaakub 2015) and widespread access to scientific sources in smaller institutes or in economically remote areas (Asnafi 2009). This will, hence, bring about both the national and international researchers' awareness of their colleagues' research in order to avoid research on the same topics (Saadat 2008).

Nowadays, due to an annual increase in purchasing scientific sources and lack of budgets in libraries to supply the research sources (Saadat, Shabani, and Asemi 2011), researchers are unable to access the scientific findings of themselves and other scholars. Since the faculty members in the field of library and information sciences have a tendency to use open-access journals and consider them equal to subscription journals (Peekhaus and Proferes 2016), academic libraries can provide unique opportunities for permanent access to recently published articles through introducing open access journals (Kinal and Rykiel 2013) and hence, they can play a key role in expediting the spread and circulation of scientific knowledge (Xue-li, Hong-ling, and Mei-ying 2011; Xia and Nakanishi 2012; Xia 2012).

One of the topics of interest regarding open access journals is the lack of standards, policies, and background required for the validity of the journals. Open access journals are still not accepted by the public as a way to publish and present research findings, which might have its roots in the lack of trust in the validity of these journals and their role in research advancement (Montgomery 2006). On the one hand, by taking into account the increasing number of free electronic journals in various realms (Saadat et al. 2011), conducting a comprehensive study seems to be necessary for determining if and to what extent these sources are reliable for presenting scientific and research studies in order to clarify the nature of free electronic journals with regard to their number of citations received, which is a means of

determining their validity (Saadat and Shabani 2009). Conducting such a study and determining the number of citations to the open access journals and the validity of unused journals seem crucial for determining their validity (Mollar2007). Due to the significance of open access journals in scientific communication (Saadat 2008) and since the results of extensive research has indicated that the extent of access in open access journals was different from that of other journals, the current study attempts to focus on the relationship between the usage count and the citations to the articles published in free and non-free journals in the field of library and information sciences.

Research purposes

- Determining the relationship between the usage count and citation of articles in free journals in the field of library and information sciences
- Determining the relationship between the usage count and citation of the articles in non-free (subscription) journals in the field of library and information sciences

Literature review

National literature

Zandian, Dashti, and Hassanzadeh (2014) conducted a study entitled “Examining the extent of citations in full-text databases in the field of library and information sciences” with the aim of examining the citations to full-text databases of MA theses of library and information sciences in the state universities of Tehran between 2005 and 2009 using bibliometrics and the citation analysis technique for the assessment of 9952 citations related to 172 MA theses available in the central libraries. They used the Bradford Law for Emerald, Irandoc, Proquest, and Science Direct databases as the core databases in the field of library and information sciences and found no significant difference considering the extent of full-text databases with regard to each database, university and topic. According to the findings, most citations were in English and also the extent of using full-text databases in theses did not have an ascending trend based on time. Only 499 out of 9952 citations were related to the full-text databases.

Saadat, Shabani, and Asemi (2011) conducted a study entitled “Examining the extent of citations of Web of Science articles to DOAJ open access journals in two areas of healthcare and medical sciences and basic sciences”. It was a bibliometrics study and 1337 English journals were investigated. DOAJ database and the cited reference search tool in the Web of Science were used. The study showed that basic sciences with 657 journals received 10116 citations. In this realm, the field of biology and biological sciences had the highest number of citations (6009 citations) and Math and Statistics had the lowest number of citations (91 citations). On the other hand, the realm of healthcare and medical sciences with 680 journals had 5965 citations. In this area, medicine (general) and dentistry had the highest (3236) and lowest (1) number of citations, respectively. The χ^2 test revealed no significant difference considering the number of journals in these two areas. However, considering the number of citations, a significant difference was found between the two fields of healthcare and medical sciences and basic sciences.

Saadat and Shabani (2009) conducted a study entitled “Examining and comparing the number of citations of articles indexed in the ISI web of science database to available journals in the open access journal guide between 2003 and 2008”. The aim was to examine the number of citations in articles indexed

in the Web of Science database to the available journals in the open access journals guide between 2003 and 2008 using the bibliometrics and citation analysis technique by searching the cited source. In this regard, from 321 cited journals among 2953 journals with 19050 citations in the Web of Science, it was observed that basic sciences with 10116 citations had the highest number of citations followed by healthcare and medical sciences with 5965 citations, engineering with 1436 citations, social sciences with 832 citations and arts and humanities with 701 citations, ranking first to fifth with regards to citations, respectively. The results indicated that the tendency towards open access journals was quite different in the area of basic sciences compared to the other four areas. Moreover, this tendency had a more significant difference in the area of healthcare and medical sciences and basic sciences compared to the areas of arts and humanities and social sciences. Moreover, a significant difference was found considering the number of citations among the five aforementioned areas.

Asnafi (2009) conducted a study entitled "Pondering upon open access journals and free delivering of a topical and organizational web" with an emphasis on free access to electronic journals and archives using the relevant studies. The findings indicated that open access journals could have played a key role considering their free access and high accessibility. Their high accessibility has provided researchers and scholars at the international level with easier access to their information content. Hence, the main purpose of scientific communication, i.e. exchange of information among different people and groups, can be carried out extensively.

Expanding the concept of open access journals and their underlying philosophy by reviewing the relevant literature and texts and library sources, including both traditional and digital ones was the aim of a study done by Saadat (2008). He indicated that open access journals, which have been created in response to the crisis of periodical journals, have provided the libraries and researchers with appropriate opportunities to easily access the scientific and research information without cost, and hence have accelerated the process of conducting research.

Another research by Rahimi et al. (2008) studied "Citing free electronic medical journals in the DOAJ databases in valid journals of Iran's Medical Sciences Universities". The aim of the study was to examine the number of citations to free electronic medical journals in the DOAJ database in valid journals of Iran's some medical sciences universities using the descriptive-survey method, document analysis technique and using two checklists of 38 scientific-research journals of some medical sciences universities between 2005 and 2006 considering the number of citations to 369 free electronic journals (scientific-research) in the field of medicine in the DOAJ database. It was demonstrated that the number of citations to free electronic journals in the field of medicine was less than one percent and the number of citations in 2006 had not increased significantly compared to that of 2005. Moreover, the journals entitled "Medication" of the faculty of Pharmacology of Tehran University of Medical Sciences and the "Iranian Urinary Journal" of ShahidBehdashti University of Medical Sciences had the highest number of citations to open-access electronic medical journals. In addition, in the area of public health medicine (general), the number of citations to open-access medical electronic journals was higher than other areas of medicine. Among the 369 medical electronic journals, the BMC Public Health Journal had the highest number of citations in the area of public health with two citations.

Hassanzadeh, Baghaee, and NorouziChakeli (2008) conducted a study entitled "co-authorship in Iranian articles in ISI articles between 1989 and 2005 and its relationship with the number of citation to those articles". Web of Science was searched. It was observed that 88.2% of articles were co-authored.

There was a direct significant relationship between the presence of a co-author and the number of citations to the articles. The findings also indicated a significant difference between the number of citations to the articles in the five subjects (basic sciences, medical sciences, engineering, agricultural sciences and humanities).

International literature

Seo et al. (2016) conducted a study entitled “Usage trends of open access and local journals: a Korean case study” with the aim of determining the usage and tendency towards open access journals. To do this scientometrics study WOS and Scopus databases were searched between 1998 and 2014. It was observed that citation rate to local journal articles were 1.8 %, while it was 3 % for open access journals and it has increased to 4.1% from 2006 to 2011. They also found that open access journals were the main sources for the researchers and tendency towards using these journals was one of the most important indices for evaluating the research trends.

Moed and Halevi (2016) examined the rate of article downloads and the number of citations to them for 1800 ScienceDirect journals and 20000 articles of the Academic Scientific Journal between 2004 and 2010. It was shown that despite the positive correlation between the usage count and number of citations, this extent might be different in terms of the journal, topic, document type and being downloaded by the author or not (self-citation).

Guerrero-Bote and Moya-Anegón (2014) conducted a study entitled “Relationship between downloads and citations at journal and paper levels, and the influence of language” with the aim of exploring the relationship between the number of downloads and citations and their relationship with the age of the journals and their language. To gather the data for this scientometrics study, Scopus and ScienceDirect databases were searched. It was observed that the number of downloads and their citations were different in various regions. For example, citations to English articles have decreased in France. With regard to the articles age and the number of downloads, the findings indicated that an increase in age would decrease the number of downloads. With regard to citations in terms of the articles age, an ascending trend was first formed and then a negative slope was observed. The results were also interesting with regard to various topical areas. The medical area had the higher number of citations, while its articles were downloaded less. On the other hand, the articles in the field of psychology had the highest number of downloads and the lowest extent of citations. The findings indicated that the highest number of downloads belonged to the U.S., China, and UK.

Correlation between article download and citation figures for highly accessed articles from five open access oncology journals were investigated by Nieder, Dalhaug, and Aandahl (2013) . The study aimed at examining the relationship between article downloads and the number of citations for 50 highly visited articles from five open access oncology journals, regardless of their subject categorization and relationship between article download and citation. It was found that the highest number of articles had been published in the “Biomed Cancer Journal”. Moreover, the number of articles in each journal had gradually increased. Eventually, a weak correlation was observed between the number of article downloads and the number of citations.

Lippi and Favaloro (2013) conducted a study entitled “Article downloads and citations: Is there any relationship?” Twenty five recently published open access articles published in 2011 in the SciVerse

database were selected. The findings showed a negative correlation between the number of downloads and the number of citations in the SciVerse database.

Comparison of citation and usage indicators for oncology journals in the ScienceDirect with JCR indicators, Web of Science and Scopus databases was carried out by Shloegl and Gorraiz (2010). The results showed a strong relationship between the number of citations and the number of downloads. In general, journals with a high number of downloads also had a higher number of citations.

Watson (2009) conducted a study entitled "Comparing citations and downloads for individual articles at the Journal of Vision" in Scopus between 2003 and 2008. A positive relationship was observed between the number of downloads and the number of citations (74%). Moreover, a direct relationship was found between the articles age and the number of citations, i.e. an increase in the articles age would lead to an increase in the number of citations. There was also a direct relationship between the number of article downloads and their age.

Davis et al. (2008) conducted a study entitled "open access publishing, article downloads, and citations: randomized controlled trial" and attempted to measure the free access to open access scientific sources through document analysis and scientometrics of 1619 scientific research and review articles (based on the number of full text downloads and abstract and protocol address) in 11 journals published by the American Physiology Association. It was observed that citations to open access articles were different from those of subscription journals after one year. Moreover, 59% of open access articles had a fewer number of citations between none months to one year after their publication (63%).

Craig et al. (2007) critically reviewed the literature to see if open access articles have greater citation impact and attempted to examine the relationship between the number of downloads of open access articles and the number of citations using 95000 articles in the field of physics and math in which the articles were controlled based on their open or subscription access, year of publication and topic. The findings indicated no significant difference between the open access and subscription articles in terms of the number of citations and no evidence was found for the less significant influence of open access articles on the number of citations.

According to the above mentioned studies, open access journals are widely used but the use behavior is different among different disciplines.

Method

The study used a citation analysis and scientometrics method. The data were extracted from the Web of Science on June 23, 2016. In the Web of Science database, the topic was limited to the field of library and information sciences in the journal citation report (JCR) section to select journals with impact factor higher than 2.5. This was done in two steps. First, the search was limited to open access journals and seven journals were retrieved. Second, the search was limited to subscription journals in the same field which resulted in 21 journals. Among those 21 journals, those with an impact factor higher than 2.5 were selected (11 journals). This was done to choose the journals with the highest usage and highest number of citations for a comparison with the open access ones. In the next step, in order to validate the publication's topic area, the publications chosen were searched in the scimagojr.com website, amongst which one of the publications that covered areas other than library and information sciences was eliminated.

Next, in order to access all articles of the journals, a new search process was applied to each of the journals using ISSN and the IS=0 formula in the advanced search section of the Web of Science. In each journal, articles were ranked from the highest number of citations to the least. The first ten articles of each journal were selected and the following information was extracted: the usage count within the last 180 days, the extent of usage by 2013, the total number of citations, the year in which the journal was indexed in WOS, and the number of articles. Finally, SPSS (version 2.0) was used for data analysis.

Findings

The findings indicated that among six open access journals (60 articles) in the field of library and information sciences in the Web of Science “Information Research-An International Electronic Journal”, and “Information Technology and Libraries” journals were the oldest (1983-2002) and had the highest number of articles. This is while other journals had been published during 2003-2008, and the average number of published articles had increased during different years.

The highest and lowest number of articles belonged to “Information Technology and Libraries” (913 articles) and Transformacao (185 articles), respectively. The average number of citations was between 3.3 (Transformacao) and 112.4 (Journal of the Medical Library Association), respectively. The extent of usage of open access journals in the field of library and information sciences varied between 10.1 (Information Research) and 17.9 (Revista Espanola de Documentacion Cientifica) since 2013.

It can be stated that there was not a significant relationship between the usage count and citation of articles in free journals in the field of library and information sciences ($p < 0.05$). Accordingly, the first research question was not confirmed. i.e. the extent of citation does not increase with an increase in the extent of usage (Table 1, Figure 1).

Fig 1 Dispersion of the usage and citation of articles in open access journals

Table 1 Pearson correlation for open access journals

The second objective was that there is a significant relationship between the usage count and citation of articles in non-free journals in the field of library and information sciences”, The findings indicated that among the ten non-open access journals in the field of library and information sciences in Web of Science (100 articles), the “International Journal of Information Management” was the oldest (1986) and other journals had been published between 1987 and 2005. The journals had between 358 and 3133 articles. However, the average number of published articles varies during different years. The highest and lowest number of articles belonged to the “Journal of the American Medical Informatics Association” (3133 articles) and “Journal of Strategic Information Systems” (358 articles), respectively. The average number of citations was between 120.1 (International Journal of Information Management) and 709.4 (Information System Research), respectively. The extent of usage of non-open access journals in the field of library and information sciences varied between 26.1 (Journal of the American Medical Informatics Association) and 181 (Journal of Computer-Mediated Communication) from 2013.

No significant relationship was observed between the usage count and citation of articles in non-free journals in the field of library and information sciences ($p < 0.01$). Accordingly, the second research question was confirmed, in other words, the extent of citation increases with an increase in the extent of usage (Table 2, Figure 2).

Fig 2 Dispersion of the usage and citation of articles in non-open access journals

Table 2 Pearson correlation for non-open access journals

The total correlations for open-access journals and non-open access journals were 0.23 and 0.40, respectively. In addition, the correlation for each journal was calculated regardless of its access type. Among open access journals, the lowest correlation coefficient belonged to “Investigation Bibliotecologica” ($r = -0.06$) and the highest correlation coefficient belonged to “Revista Espanola de Documentation Cientifica” ($r = 0.88$), which were weak to strong. Among non-open access journals, the lowest correlation coefficient belonged to the “International Journal of Information Management” ($r = 0.21$) and the highest correlation coefficient belonged to the “Journal of Management Information Systems” ($r = 0.98$), which were weak to strong (See Table 3).

Table 3 The Correlation between the usage count and citation for each journal based on the access type

Discussion and conclusion

According to the findings, there was not a significant relationship between the usage count and number of citations to articles ($p > 0.05$). In this case, the results were in line with those of Zandiyan, Dashti, and Hassanzadeh (2014) which indicated no significant difference between the usage count of full-text databases in these in terms of each database, university and topic. Moreover, there was not a significant relationship between the number of articles in open access journals and the number of citations, i.e. an increase in the usage count would not increase the number of citations. These results are in line with those of Guerrero-Bote and Moya-Anegon (2014). They found that in the area of medicine, some of the journals had the highest number of citations, while they had a lower download rate of articles. Meanwhile, the area of psychology had the highest number of downloads, but the lowest number of citations. The results were also not in line with those of Watson (2009).

On the other hand, the findings indicated that there was a significant relationship between the usage count and number of citations to articles ($p < 0.01$). These results were in line with those of Hassanzadeh, Baghaee and NorouziChakeli (2008). Moreover, there was a significant relationship between the number of articles in non-open access journals and the number of citations, i.e. with an increase in the usage count, the number of citations would also increase. This is also in line with the results of Schloegl and Gorraiz (2010), which indicated the strong relationship between the number of citations and the number of downloads for the sample journals.

The total correlation among the open-access journals and non-open access journals were 0.23 and 0.40, respectively. These results were in line with those of Nieder, Dalhaug, and Aandahl (2013) since they

found a weak correlation between the number of downloaded articles and the number of citations. The results of Craig et al. (2007) also indicated that there was a significant difference between the number of citations of open access and subscription journals and no evidence was found for the influence of open access articles on the number of citations.

Moreover, the correlation for each journal of any access type was calculated. Among open access journals, the lowest correlation coefficient belonged to *Investigation Bibliotecologica* ($r=-0.06$) and the highest correlation coefficient belonged to *Revista Espanola de Documentacion Cientifica* ($r=0.88$), which were weak to strong. The results were in line with those of Lippi and Favalaro (2012) which demonstrated a negative correlation between the numbers of downloads and the number of citations in the SciVerse database. Among non-open access journals, the lowest correlation coefficient belonged to the "International "Journal of Information Management" ($r=0.21$) and the highest correlation coefficient belonged to the "Journal of Management Information Systems" ($r=0.98$), which were weak to strong. These results were in line with those of Moed and Halevi (2016) which indicated a strong correlation between the usage count and the number of citations in all journals.

The study found no relationship between the open access journals use and the rate of citation in the field of library and information science. Although the previous study indicated the faculty at this field have a tendency to use open access journals (Peekhaus, and Proferes 2016), it was not significantly related to the citation rate. Perhaps the reason is that the open access journals are not yet accepted because of the lack of trust in the validity of these journals.

References

- Asnafi, A. R. (2009). Reflection on access to open access journals and institutional escrow subject sometimes for free. *Ketab Mah Koliyat*, 51-61.
- Craig, I. D., Plume, A. M., McVeigh, M. E., Pringle, J., & Amin, M. (2007). Do open access articles have greater citation impact?: A critical review of the literature. *Journal of Informetrics*, 1(3), e239-248. doi: <http://dx.doi.org/10.1016/j.joi.2007.04.001>
- Davis, Ph. M., Lewenstein, B. V, Simon, D. H, Booth, J. G, & Connolly, M. J. L. (2008). Open access publishing, article downloads, and citations: randomised controlled trial. *BMJ*, 337. doi: 10.1136/bmj.a568
- Guerrero-Bote, V. P., & Moya-Anegón, F. (2014). Relationship between downloads and citations at journal and paper levels, and the influence of language. *Scientometrics*, 101(2), e1043-1065. doi: 10.1007/s11192-014-1243-5
- Hasan Zade, M., Bghaei, S., & Norouzi chakli, A. R. (2008). Co-authorship in Iranian publications in ISI journals during 1989 and 2005 and its relationship with citations to the articles. *Science and Technology Policy*, 1(4), 11-19.

- Kinal, J., & Rykiel, Z. (2013). Open Access as a Factor of Enhancing of the Global Information Flow. *Procedia - Social and Behavioral Sciences*, 83, e156-160. doi: <http://dx.doi.org/10.1016/j.sbspro.2013.06.030>
- Lippi, G., & Favaloro, E. J. (2013). Article downloads and citations: Is there any relationship? *Clinica Chimica Acta*, 415, e195. doi: <http://dx.doi.org/10.1016/j.cca.2012.10.037>
- Masrek, M. N., & Yaakub, M. Sh. (2015). International Conference on New Horizons in Education, INTE 2014, 25-27 June 2014, Paris, France Intention to Publish in Open Access Journal: The Case of Multimedia University Malaysia. *Procedia - Social and Behavioral Sciences*, 174, e3420-3427. doi: <http://dx.doi.org/10.1016/j.sbspro.2015.01.1013>
- Moed, H. F., & Halevi, G. (2016). On full text download and citation distributions in scientific-scholarly journals. *Journal of the Association for Information Science and Technology*, 67(2), e412-431. doi: 10.1002/asi.23405
- Mollar, A. (2007). The Rise of Open Access Journals: Their Viability and Prospects for the African Scholarly Community. *Africa Media Review*, 15(1-2), 1-21.
- Montgomery, G. (2006). Open access journal: the future. *Forest Research Extension Partnership*, [cited 2008 Apr 27].
- Nieder, C., Dalhaug, A., & Aandahl, G. (2013). Correlation between article download and citation figures for highly accessed articles from five open access oncology journals. *Springerplus*, 2, 261-272.
- Peekhaus, W., & Proferes, N. (2016). An examination of North American Library and Information Studies faculty perceptions of and experience with open-access scholarly publishing. *Library & Information Science Research*, 38(1), e18-29. doi: <http://dx.doi.org/10.1016/j.lisr.2016.01.003>
- Rahimi, A. R., Asgari, R., Taghi Yar, S., & Akbari, A. (2008). Journal Citation free access electronic journal articles DOAJ database University of Medical Sciences in Iran. *Health Information Management*, 5(1), 5-19.
- Saadat, R. (2008). Open Access Journals: Concepts and Applications. *Faslname Ketab*, 85, 127-145.
- Saadat, R., & Shabani, A. (2009). Review and compare cited journal articles indexed in the ISI Web of Science journals in open access journals during the years 2008-2003 Guide. *Motaleat Tabiati V Ravanshenasi Daneshgah Ferdisi Mashhad*, 10(2), 157-178.
- Saadat, R., Shabani, A., & Asemi, A. (2011). Study of the Citations off the ISI Web of Science database to open access journals in the field of Health Sciences and Medical Sciences. *Health Information Management*, 8(2), 165-175.
- Schloegl, Ch., & Gorraiz, J. (2010). Comparison of citation and usage indicators: the case of oncology journals. *Scientometrics*, 82(3), e567-580. doi: 10.1007/s11192-010-0172-1
- Seo, J. W., Chung, H., Yun, J., Park, J. Y., Park, E., & Ahn, Y. (2016). Usage Trends of Open Access and Local Journals: A Korean Case Study. *PLoS One*, 11(5), e1-15. doi: 10.1371/journal.pone.0155843
- Watson, A. B. (2009). Comparing citations and downloads for individual articles at the Journal of Vision. *Journal of Vision*, 9(4), e1-4. doi: 10.1167/9.4.i
- Xia, J. (2012). Positioning Open Access Journals in a LIS Journal Ranking. *College & Research Libraries*, 73(2), 134-145.
- Xia, Jingfeng, & Nakanishi, Katie. (2012). Self-selection and the citation advantage of open access articles. *Online Information Review*, 36(1), 40-51.

- Xue-li, L., Hong-ling, F., & Mei-ying, W. (2011). Correlation between Download and Citation and Download-citation Deviation Phenomenon for Some Papers in Chinese Medical Journals. *Serials Review*, 37(3), e157-161. doi: <http://dx.doi.org/10.1016/j.serrev.2011.02.001>
- Zandian, F., Dashti, A., & Hasan Zade, M. (2014). Evaluation of citations to full-text databases in library and information science. *Human Information Interaction*, 1(1), 55-67.

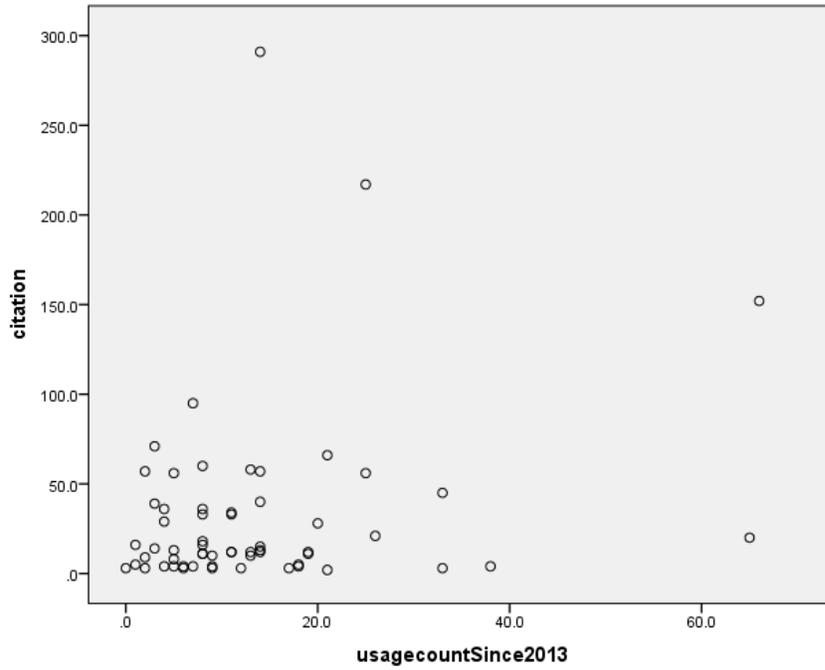


Fig 1 Dispersion of the usage and citation of articles in open access journals

Table 1 Pearson correlation for open access journals

		Citation
Extent of use in 2013	Correlation coefficient value	0/237
	Test significance level	0/068
	Number of articles	60

* .The Correlation is significant at the 0.05 level (2-tailed).

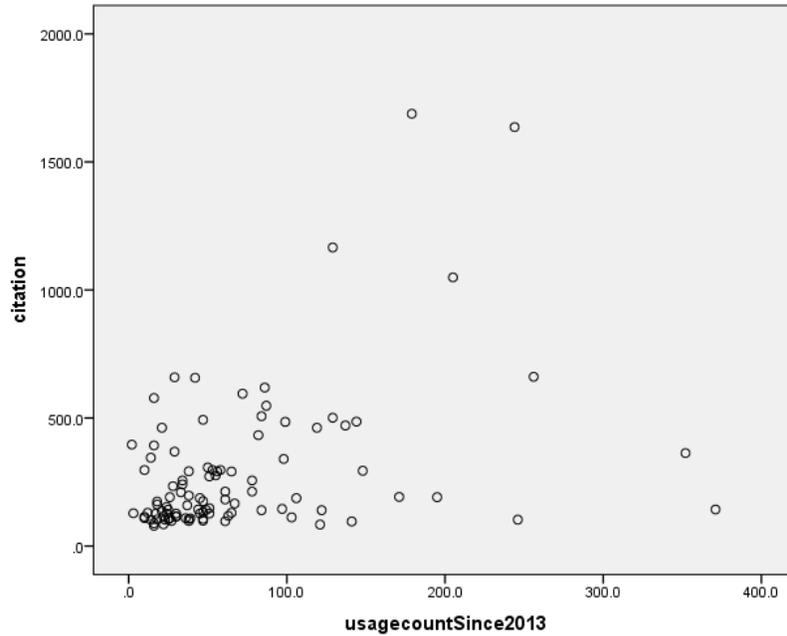


Fig 2 Dispersion of the usage and citation of articles in non-open access journals

Table 2 Pearson correlation for non-open access journals

		Citation
Extent of use in 2013	Correlation coefficient value	0/401
	Test significance level	0/000
	Number of articles	100

* .The Correlation is significant at the 0.05 level (2-tailed).

Table 3 The Correlation between the usage count and citation for each journal based on the access type

Open Access Journals	Correlation	Year	Article Count
INFORMATION TECHNOLOGY AND LIBRARIES	0.302639501	1983	913
JOURNAL OF THE MEDICAL LIBRARY ASSOCIATION	0.327649487	2003	652
Revista Espanola de Documentacion Cientifica	0.887643333	2008	246

INFORMATION RESEARCH-AN INTERNATIONAL ELECTRONIC JOURNAL	0.3159725	2002	661
INVESTIGACION BIBLIOTECOLOGICA	- 0.060208482	2007	215
TRANSINFORMACAO	- 0.435859021	2008	185
All 6 Journals	0.23744419		
Non-Open Access Journals	Correlation	Year	Article Count
JOURNAL OF INFORMATION TECHNOLOGY	- 0.256858106	1993	535
JOURNAL OF COMPUTER-MEDIATED COMMUNICATION	0.177007094	2005	486
JOURNAL OF THE AMERICAN MEDICAL INFORMATICS ASSOCIATION	0.456636439	1994	3133
INFORMATION SYSTEMS RESEARCH	0.351498898	1990	680
JOURNAL OF MANAGEMENT INFORMATION SYSTEMS	0.981395957	1999	605
EUROPEAN JOURNAL OF INFORMATION SYSTEMS	0.099385034	1995	729
INTERNATIONAL JOURNAL OF INFORMATION MANAGEMENT	- 0.219990413	1986	1194
JOURNAL OF STRATEGIC INFORMATION SYSTEMS	0.850893814	1995	358
INFORMATION SYSTEMS JOURNAL	0.918293952	1991	421
GOVERNMENT INFORMATION QUARTERLY	0.454909413	1987	1060
All 10 Journals	0.401363628		