



Citation and Content Analysis of Journal of Health Management and Informatics in 2014-2016

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Abstract

Background: The aim of citation and content analysis is to improve the quality of scientific productions, identify the authors' trends, etc., and finally provide solutions to improve the present status. Therefore, the aim of this study was to determine the citation and content status of Journal of Health Management and Informatics in 2014 -2016.

Methods: This is a descriptive cross-sectional study performed in 2016. The study population was all published articles in 2014-2016. Data gathering was done through a self-made checklist including content (corresponding authors affiliations, type of articles, study method, financial support, topics, collaboration rate, etc.) and citation analysis (number of references), language of references, type of references and half life time of references). Data were abstracted and reported based on the research objectives using Excel software v 2007 and descriptive statistics.

Results: The results showed that from all 67 papers surveyed, 82.08% of the published articles were original ones, and 98.5% were done through team works. 82.10% of the references were in the English language and 79.17% of them were journal articles. The half-life of the references used by authors was 9.70 years.

Conclusion: It is suggested that journal authorities should supervise the resources used by the authors; they should also provide context for encouraging the authors to publish articles resulting from research projects and theses.

Keywords: Bibliometric, Content analysis, Citation analysis

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Introduction

Nowadays, journals as important channels of communication and exchange of thoughts and new scientific results are available to professionals and other people in the community (1). Content analysis is defined as any systematic procedures used to verify the content of the recorded information. It is defined as a research method which links the data to its content in a credible and repeatable way (2). The related researches in the field of scientometrics in scientific journals show that it is usual to validate the journals and evaluate their articles in terms of quality and quantity, and this duty was done by the editorial board or experts. This action is important in improvement of the journal trends and identification of the strengths and weaknesses of

the articles and also thematic balance (3, 4).

It is obvious that evaluation of published journals as documents can show the trend changes made in various fields of research in different periods of time (5). Citation in fact means confirmation and intellectual approval of an article or a research project published or unpublished to prove a truth. While when an implied confirmation is given to an article by another article, it is referred to as a reference, but the acknowledgment that the article is received from another is referred to as a citation (6). Many studies have looked at the citation and identification of the most cited articles in various subject areas and identified the list of 100 most cited articles in their field of study (7-9). For example, Yang and Pan in their study showed that the average references in Asian

Journal of Andrology were 20.43; in National Journal of Andrology it was 10.18 for each article. In terms of the type of resources, most of them were journal articles, so that in Asian Journal of Andrology 95.84 % and in National Journal of Andrology 93% of the references used by the authors were journal articles, and National Journal of Andrology authors used more up-to-date references (10). TIEW in a study on evaluation of 258 articles, it was indicated that 63.2% of the articles had one or two authors; the average references for each article was 16.49. Also, 36.82% of the articles were written in collaboration with college researchers and 13.56% were written in collaboration with researchers from different countries (11).

The results of citation and content analysis studies can help to identify the core journals, most important resources for authors, author's trends, etc. (4, 5, 12-15) that is a great help for policymakers and journal editorial team. For example, Khaleghi et al. in their study revealed that most important resources that authors used were journals; therefore, it is suggested that policymakers provide availability for most journals used by authors in Qom University of Medical Sciences website (16). Afshar et al. indicated that the collaboration rate of authors was in a moderate level and it would be better to increase this index (17). In another study, based on the results, it was suggested that authorities should make a plan to balance the specified topic in publication (18).

Therefore, an assessment of the Journal of Health Management and Informatics condition, as one of the most important journals in medical informatics, health information technology, health information management and health care services management in Iran has a high potential to become an international journal in these fields of study. On the other hand, no citation and content analysis has been done up to now; it can help the managers and editorial team to create a better programming for supply of resources to authors and other researchers and improvement in the quality of scientific productions. Therefore, the aim of this study was to perform a content and citation analysis of Journal of Health Management and Informatics in 2014-2016.

Methods

This is a scientometrics descriptive cross-sectional study that was done in 2017. Data gathering was done by a citation and content analysis checklist on 2014 to 2016 published articles. The population of this study consisted of all published articles it was mentioned at the interval that were investigated by census. The checklist consisted of two main sections: content

analysis, citation analysis.

Content analysis included the type of the study, corresponding author affiliation, study methods, collaboration statues, authors' number, Financial Support of articles, etc.

Citation analysis included references number, half-life of references, the language used in thereferences, type of references, number of self-citations (including journal self-citation and authors self-citation) and etc.

To survey and finally confirm the validity of checklist, we used the opinions of five experts in Health Information Management and Librarianship in the medical branch and then the checklist was revised and redesigned. By visiting the journal website and downloading all published articles, the researchers gathered the data through a checklist and entered them into Excel v 2007 software.

For abstracting and reporting the data, we used such indexes as mean, median and also frequency by MS-Excel v 2007, and the results were reported based on the main aim of the study.

In order to calculate the half-life of the used references, at first we discriminated each reference by the year of publication and since the publication date of the article was deducted, this was repeated for all references; thus, the half-life of the resources for each article was calculated and then the average half-life of the used references was calculated. The half-life showed the freshness of references used by the authors.

X =year of publication of the reference used in article (separately for all references)

A =year of publication of the article

$H-L$ for any article= $n (X-A)$

For example, in an article the years of the references were 2010, 2009, 2015, 2008 and 2001 and the year of publication of the article was 2016; the half-life for the references were 6, 7, 1, 8, 15 and that for the article references was 7.4 years.

Results

67 published articles in 2014-2016 (three years) in three volumes (three years from 2014 to 2016) and 12 issues were analyzed in this study. Results are shown in two parts including content analysis and citation analysis.

Based on the results, most of the affiliations were related to Shiraz University of Medical Sciences and especially college of management and health informatics (50.75%); also, the most articles type were original articles (82.08%). Most study methods were cross-sectional studies (51%) and most of the financial supports were independent and other types of studies (67.16%) (Table 1).

Table 1: Content analysis of the published articles in the Journal of Health Management and Informatics in 2014-2016

Items		Number	Percent
Corresponding authors affiliations	Grade one universities	16	23.89
	Grade two universities	6	8.95
	Shiraz University of Medical Sciences	34	50.75
	Others	11	16.41
	Total	67	100
Type of articles	Original articles	55	82.08
	Review	4	5.98
	Case report	1	1.50
	Letter to editor	7	10.44
	Total	67	100
The study method	Cross- sectional (analytics, descriptive, etc.)	34	51
	Non Cross- sectional (analytics, descriptive, etc.)	21	31
	Library	11	16.5
	Other (experimental, semi experimental and etc.)	1	1.5
	Total	67	100
Financial Support of articles	.University Research Dept	12	17.99
	Thesis	6	8.95
	Research centers	4	5.98
	Independent and other studies	45	67.16
	Total	67	100

Other results showed that most repeated topics in published articles were Health Care Management Services (35 articles; 52.2%) including human resources management, quality of life, quality of services, Health Information Management and Technology, Medical Informatics, Bibliometric, etc. 27 articles (40.3%) included Health Information Systems, Tele-medicine, Decision Support Systems, Data Mining, etc.; also, 5 articles (7.4%) were about Health Economics (Figure 1).

Table 2 shows collaboration statues of the authors

of the articles. As shown in Table 2, in all 249 authors, the most number of authors in an article was 9 authors. Articles with 3 authors (26.86%) and 4 authors (23.88 percent) had the most frequency of authors numbers.

The results displayed in Table 2 show that in the past 3 years (2014-2016) 241 authors took part in article writing and for one article 3.58 authors participated.

Citation analysis results showed that the authors used 1618 references (for one article 24.14 references); the average reference number for one article in 2014

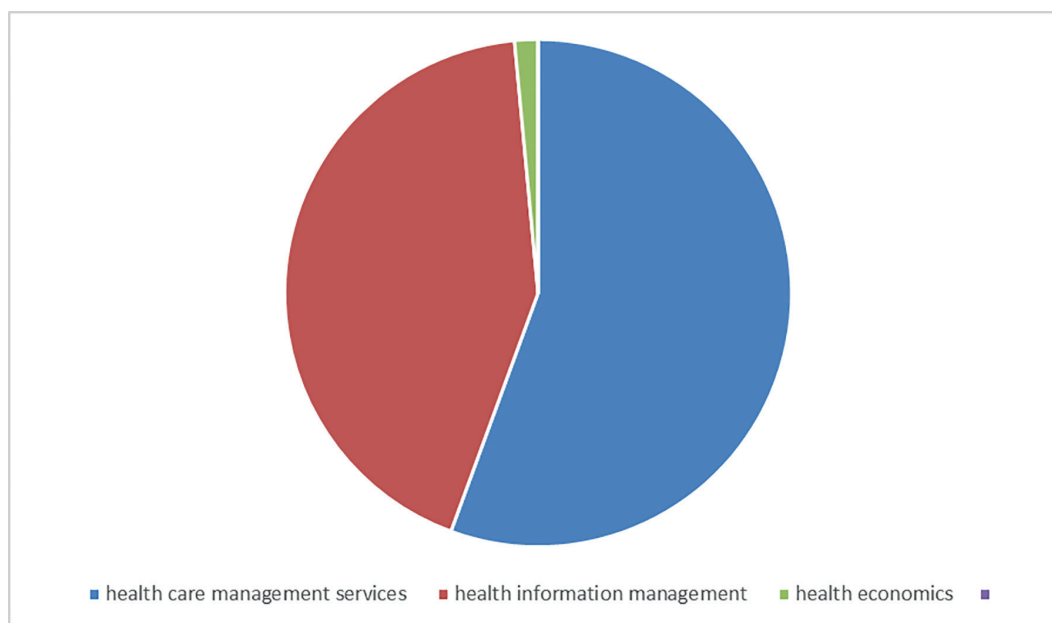


Figure 1: The topics of published articles in the Journal of Health Management and Informatics during 2104-2016

Table 2: Collaboration rate of the article authors in the Journal of Health Management and Informatics in 2014-2016

Years	One author	Two authors	Three authors	Four authors	Five authors	Six authors	Seven authors	Eight authors	Nine authors
2014	1	1	6	3	5	1	1	2	-
2015	-	4	6	8	5	-	-	-	-
2016	-	7	6	5	4	1	-	-	1
Total	1	12	18	16	14	2	1	2	1
Total %	1.5	17.91	26.86	23.88	20.89	2.98	1.5	2.98	1.5

was 22.75 with a total of 455 references. In 2015, for one article 26.43 and totally 608 references were used and in 2016 for one article 23.12 and totally 555 references were mentioned.

Table 3 shows the language of the references used; the language of the reference was mostly English.

Table 4 displays the type of the references used by the authors; most of the citations were from journal articles (79.17%) and after than books (12.66%).

Table 5 shows the half life of the references used in published articles; the half life time of the references in the three years was 9.70.

Other results showed that the total self-citations were 19, and 12 articles had self-citations; also, the journal's self-citation was found to be one case.

Discussion

Today, all validated journals in all fields use citation and content analysis to better identify their status

and have more effective programming. This field of study show the status of the journal by determining the core journals, most important resources for authors, author's trends, collaboration rate, half-life of resources and some other important indexes. The results showed that most corresponding authors in the published articles in the last three years were affiliated to Shiraz University of Medical Sciences; also, most of the were published by researchers and faculty members affiliated to Shiraz University of Medical Sciences. Moreover, the results showed that most of the published articles were original ones.

The results of Aligol et al.'s studies are in the same line with those of this study (19). Also, most of the articles' methods were cross-sectional (analytical cross-sectional, descriptive analytical) and descriptive and analytical. Zeraatkar and Karami in their study entitled "Citation and content analysis of Hormozgan Medical Journal" obtained similar results (20). It

Table 3: The frequency of the language of the references used in the articles by authors in the Journal of Health Management and Informatics in 2014-2016

Year	Persian references	English references	Total
2014	127	338	455
2015	115	493	608
2016	56	499	555
Total	284	1280	1618
Percent	17.90	82.10	100

Table 4: The frequency type of the references in the published articles in the Journal of Health Management and Informatics in 2014-2016

Year	Books	Journal articles	Conferral articles	Websites	Reports	Theses	Others	Total
2014	71	334	7	23	3	3	5	455
2015	77	480	21	11	2	10	7	608
2016	57	458	10	15	0	5	10	555
Total	205	1281	38	49	5	18	22	1618

Table 5: Half life time of the references used in the published articles in the Journal of Health Management and Informatics in 2014-2016

Year	Number of articles	Half Life time of references
2016	24	9.07
2015	23	8.19
2014	20	11.85
Total	67	9.70

is suggested that editorial team of journals should publish other types of articles and apply limitations to publishing cross-sectional studies.

Furthermore, the results showed that for one published article in the journal of health management and informatics, 3.58 authors were involved. This rate shows that the authors' team work is in an acceptable condition. Ghahnaviyeh et al. (21) in their study entitled "Content and Citation Analysis of Articles Published in the Journal of "Health Information Management" in 2011 concluded that for per published article in the Journal of "Health Information Management, 3.03 author were involved. Also, Goldfinch et al. in their study concluded that the citation rate to articles with more authors is high and maybe it is due to their high quality (22).

The results of this study showed that the half-life of the resources of the published articles in the journal of health management and informatics during 2014-2016 was 9.70 and in 2014 it was 11.85 that is the highest rate of half-life in this journal.

Batoli in her study entitled "Survey on citations and collaboration rate in Feyz, Journal of Kashan University of Medical Sciences, from 2002 through 2008" revealed that the half-life of the resources was almost 8 years (23). The results of the present study showed that the half-life condition of published articles during the last three years was relatively in an acceptable level; therefore, with regard to the results, it is suggested that the authorities of the journals should accept updated resources.

The results of other studies showed that 1280 citations were in the English language and after that Persian language references were used by researchers in the Journal of Health Management and Informatics. Goldfinch et al. in their study found that frequency of the distribution of the language of references was 42% English and then Persian; this does not agree with the results of the present study (22).

The results showed that most of references used in published articles were journal articles. Shahraki and Anbari in their study showed that 83.23% of the references used in the Journal of Zabol University of Medical Sciences and Health Services were from journal articles and the second type of references used by the researchers was from books (24).

Olatokun in his study on the review of the citations of theses concluded that journal articles were the most citations and after that books were the most important references used by researchers (25). Due to the high frequency of published journals used by the authors and the provision of up-to-date scientific information, many researchers used these

kinds of resources. Therefore, it is recommended that the journal editors should take measures to provide the resources and journals required by the authors and allow the researchers to access these resources.

In the present study, it was also shown that self-citation rate was 19 cases and one self-citation item was seen in the Journal of Health Management and Informatics. However, in many reports the allowed self-citation rate is between 3 to 36% (25-27). Of course, the self-citation status of the journal was appropriate.

With regard to some results of this study that showed some topics have more frequency in the published articles, it is suggested that authorities and editorial board should balance the subjects in the articles to be published.

To improve the quality of the articles, it is recommended that technical editor of the journal should monitor the resources used, the old and invalid references should be checked out, and the authors should be asked to use new references. With regard to the specialized nature of the journal, we recommend that the journalists should introduce journals in specific fields to the researchers. Also, the editorial team of the journal should be more sensitive to editors (both literary and technical) and follow the instructions of valid databases such as Pub Med and Scopus so that the articles can be indexed in these databases in a near future. It is recommended that in further studies the citation and content analysis of other journals in Shiraz University of Medical Sciences be calculated.

One of the most important limitations in the study was the failure to report the authors' academic rank in the articles, which caused the academic authors to be excluded from the study.

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