

## **Open Access Health and Medicine Journals - An Informative Study**

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### **Abstract**

The main purpose of the study was to analyse various aspects of open access journals in the field of health and medicine registered in the Directory of Open Access Journals (DOAJ). The data were collected from the DOAJ and websites (homepages) of the health and medicine journals, in the month of December 2017. The quantitative method was applied for data analysis to reveal the findings. The results reveal that open access journals in the field of health and medicine are increasing at an exponential rate and currently, 636 health and medicine journals are registered in the DOAJ. These journals are published from the seventy five (75) countries by more than two hundred (200) publishers in the twenty six (26) languages of the world. The maximum number of journals is published from the United Kingdom (81, 12.74%), by the BioMed Central (44, 6.92%), and in the English language (565, 88.83%). The results also reveal that the majority of the health and medicine journals (396, 62.26%) does not charge publication fee and adopt the peer-review system (99.84%) to evaluate the articles before publication in the journal. The figures may not represent the actual number of the open access health and medicine journals available online as the scope of the study is restricted to the Directory of Open Access Journal (DOAJ) only.

## Keywords

Health Science; Medicine; Open access; Open access journals

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## Introduction

The web has changed the entire scholarly communication process and has revolutionized the exchange of information among researchers (Goodrum, McCain, Lawrence & Giles, 2001). It has gained importance as the main communication tool among the researchers and many documents are openly accessible to the full-text level (Hoogenboom, 2003). Open Access (OA) is a new word used to describe a new manner to access literature on the Internet free of cost. The Budapest Open Access Initiative (2002) described OA as:

*[...] literature, freely available on the public Internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the Internet itself.*

The OA movement was formally started with the Budapest Open Access Initiative (BOAI), followed by the Bethesda Statement on Open Access Publishing (BSOAP) and the Berlin Declaration, popularly known as the BBB or 3B. However, the idea of OA was active in the minds of scholars before the Budapest Open Access Initiative as few journals were available under the title of freely accessible journals (Loan & Shueb, 2016). However, these initiatives took the movement fast on the path of success. Presently, the world is witness of a good number of the open access publications and archives. In the open access scholarly communication process, the first achievement was the establishment of the Directory of Open Access Journals (DOAJ) in the year 2003.

The Directory of Open Access Journals (DOAJ) is maintained and partly funded by the Lund University Libraries. The Directory of Open Access Journals (DOAJ) service covers free, full text, quality-controlled scientific and scholarly journals with the purpose to provide coverage to almost all subjects and languages. The DOAJ contains two types of open access journals- a) Free open access journals (authors do not pay any processing fees) and b) Open Access journals with the article processing charges (APCs). Presently, the DOAJ has 11,122 journals published from the 123 countries containing 2,902,665 articles ([www.doaj.org](http://www.doaj.org)).

## Literature Review

A good amount of literature is available on the Internet via open access form. In the year 1992, only the five journals were freely accessible and the number increased to 1200 in the year 2004 (Falk, 2004). An investigation regarding the sources of various open access journals was carried

out by Kaufman-Wills Group (2005) and it was found that only 248 journals were indexed in the Directory of Open Access Journals (DOAJ) from all disciplines among which only 45 percent were in Science and Technology, 34 percent in Medicine, 10 percent in the Social Sciences and 7 percent in the Arts and Humanities. Lone, Rather, and Shah (2008) revealed that there were 3,756 open access journals in the DOAJ, and the top five contributing countries were the USA, Brazil, UK, Spain and Germany.

Rufai, Gul and Shah (2011) found a total of 144 open access journals in the three databases DOAJ, Ulrichsweb.com and J-Gate pertaining to the field of library and information science. These titles were contributed by the 37 countries with a major contribution from the USA (45, 31.25%), Brazil (12, 8.33%) and Spain (10, 6.95%). The language diversity showed that about 105 (72.92%) were monolingual, 28 (19.44%) bilingual and only 6 (4.17%) were in the three languages. Husain and Nazim (2013) reported that there were 106 open access journals in media & communication published from 34 different countries of the world. The highest number of open access journals was published in Brazil (19) by academic institutions (73) and in the English language (51). Loan (2014) found that the DOAJ indexed 8,622 journals covering more than 100 subject areas in which the maximum number of journals were published from USA (120, 21.16%) in the subject field of education (567) and in the English language (430, 75.84%). Loan (2014) further revealed that the majority of the education journals (496, i.e., 87.48%) did not charge any publication fee from the authors and still 100 per cent had maintained their continuity.

Pujar (2014) found 147 library and information science journals in the DOAJ in which the majority was published from the USA (37, 25.17%), in the English language (71, 48.30%) and were indexed (98, 66.67%) in various abstracting and indexing databases such as Library and Information Science Abstract (LISA) and Library, Information Science and Technology Abstracts (LISTA). Loan (2015) found 607 business and economics journals in the DOAJ published from the 67 countries of the world. The maximum number of journals (88, 14.50%) was published from Brazil in the English language (498, 82.04%) and during the first decade (2001-2010) of the 21st century (382, 62.93%). Sahoo, Birtia and Mohanty (2017) revealed that there were only 13 LIS journals in the DOAJ in 2003 and the number reached to 158 in 2016. The authors identified 158 LIS journals indexed in the DOAJ published from 43 countries in 21 different languages.

A number of studies have been carried out all over the world on different parameters of open access journal generally and more specifically on the DOAJ. The research suggests that the idea of open access journals was alive in the minds of scholars before the Budapest Open Access Initiative (BOAI) and in fact, few journals were freely accessible. However, after the formal launch of open access by the Budapest Open Access initiative (BOAI), the movement has spread exponentially all over the world, as now the open access journals are published from all the

regions and countries in all subject areas and in almost all influential languages of the world. The present study is an attempt to analyze the open access journals in the field of health and medicine registered in the DOAJ and will be a step forward in the open access scholarly publishing.

## **Research Design**

### **a) Significance of the study**

Medical research yields important and valuable information that benefits the people of the world. Communications that facilitate the widest global dissemination of such information are valuable for public health, while those communications methods that restrict the availability of such information limit this benefit. Open access is particularly valuable for developing countries where limited financial resources have historically deprived health care professionals of the latest medical information (Grouse 2014). Therefore, the health and medicine has been selected as the subject of the study and the open access journals registered in the Directory of Open Access Journals (DOAJ) have been selected for the study.

### **b) Objectives**

The main purpose of the study is to analyse various aspects of open access journals in the field of health and medicine registered in the Directory of Open Access Journals (DOAJ). Broadly, the present study aims:

1. To identify the subject coverage of journals in the field of health and medicine,
2. To identify the growth-rate of journals in the field of health and medicine,
3. To identify the publishing countries of journals in the field of health and medicine,
4. To identify the leading publishers of journals in the field of health and medicine,
5. To identify the linguistic trends of the journals in the field of health and medicine,
6. To identify the economic models adopted by journals in the field of health and medicine,
7. To identify the licensing types of journals in the field of health and medicine, and
8. To identify the peer review process of journals in the field of health and medicine.

### **c) Methodology**

In the present study, the Directory of the Open Access Journals (DOAJ) was selected as the source for identification of the open access journals in the field of health and medicine. There were six hundred thirty six (636) health and medicine journals registered in the DOAJ in the month of December 2017. The data were collected from the DOAJ and websites (homepages) of these journals in order to achieve the set objectives.

### **d) Limitations of Study**

The study is limited only to the Directory of Open Access Journals (DOAJ) and therefore, figures

do not represent the actual number of open access health and medicine journals available online. Therefore, the findings should not be generalized.

## Data Analysis

### 1. Subject Coverage

The DOAJ lists 636 journals in the field of health and medicine. The maximum journals publish articles on medicine (205, 32.23%) only whereas 121 (19.03%) publish articles on both health and medical sciences and 14 (2.20%) only on health sciences. A good number of journals are interdisciplinary (106, 16.67%) that include articles on the health and medicine as well whereas few journals are related to the specialized fields of the medical sciences like Pediatrics (2.36%), Dentistry (2.36%), Nursing (2.04%), Pharmacy (2.04%) and Surgery (1.73%) respectively (Table 1). The journals on other allied fields are also available in the Directory of Open Access Journals (DOAJ).

**Table 1. Subject coverage of the health and medicine journals**

No.	Subject	Number	Percentage
1	Medicine (General)	205	32.23
2	Health and Medical Sciences (General)	121	19.03
3	Pediatrics	15	2.36
4	Dentistry	15	2.36
5	Health Sciences (General)	14	2.20
6	Nursing	13	2.04
7	Pharmacy	13	2.04
8	Surgery	11	1.73
9	Other allied Subjects	123	19.34
10	Interdisciplinary	106	16.67
Total		636	100

### 2. Growth-rate

It is evident from the data that the open access journals are published very fast and gaining momentum every passing day. There were only 36 health and medicine journals till 2005 and the number increases at a very exponential rate after every 5 years. The growth-rate of the journals varies from 200 percent to 350 percent from the Budapest Open Access Initiative within 15 years (Table 2).

**Table 2. Growth-rate of the health and medicine journals**

No.	Time period	Number	Cumulative Number	Growth Rate
1	≥ 2005	36	36	
2	2006-2010	74	110	206%
3	2011-2015	253	363	342%
4	2016 – 2017	273	636	108%
5	2016 – 2020 (Projected)	682	1045	270%

### 3. Publishing Countries

Presently, 75 countries have been identified for their contribution to DOAJ in the field of health and medicine. The top five contributors are the United Kingdom (81, 12.74%), Brazil (57, 8.96%), Poland (49, 7.70%), Indonesia (42, 6.60%) and Turkey (39, 6.13%) and Iran (39, 6.13%) each respectively (Table 3).

**Table 3. Publishing countries of the health and medicine journals**

Rank	Country	Number	Percentage
1	United Kingdom	81	12.74
2	Brazil	57	8.96
3	Poland	49	7.70
4	Indonesia	42	6.60
5	Turkey	39	6.13
5	Iran	39	6.13
6	United States	29	4.56
7	Spain	20	3.14
8	Egypt	19	2.99
9	Germany	18	2.83
10	Switzerland	16	2.52
11	Italy	15	2.36
12	Colombia	13	2.04
13	Russian Federation	11	1.73
14	Korea	10	1.57
14	South Africa	10	1.57
15	Pakistan	8	1.26
15	Argentina	8	1.26
	Other countries (57)	152	23.90
	Total	636	100

### 4. Leading Publishers

More than 200 publishers from various backgrounds like commercial, institutional, and non-profit organizations, associations and societies, etc. contribute journals in the field of health and medicine. The maximum number of journals is contributed by the BioMed Central (44, 6.92%) followed by the Hindawi Publishing Corporation (20, 3.14%) and Wolters Kluwer Medknow Publications (18, 2.83%) respectively. The prominent commercial publishers like Elsevier (13,

2.04%), Springer (11, 1.73%), Sage (11, 1.73%), and Wiley (5, 0.79%) also publish open access journals registered in the DOAJ (Table 4).

**Table 4. Leading publishers of the health and medicine journals**

Rank	Publisher	Number	Percentage
1	BioMed Central	44	6.92
2	Hindawi Publishing Corporation	20	3.14
3	Wolters Kluwer Medknow Publications	18	2.83
4	Dove Medical Press	16	2.52
5	Termedia Publishing House	16	2.52
6	Razavi Hospital, Mashhad, (Iran)	13	2.04
6	De Gruyter Open	13	2.04
6	Elsevier	13	2.04
6	Galenos Yayinev	13	2.04
7	MDPI AG	12	1.89
8	Springer	11	1.73
8	SAGE Publishing	11	1.73
9	PAGE Press Publications	8	1.26
10	Via Medica	6	0.94
10	Health and Medical Publishing Group	6	0.94
11	Wiley	5	0.79
	Others	411	64.62
	Total	636	100

## 5. Linguistic Analysis

The linguistic assessment of the journals shows that 68.87 percent (438) of journals are monolingual, 22.33 percent (142) bilingual, and 4.56 percent (29) trilingual and less than 5 percent are in more than 3 languages. The bilingual journals (22.33%) publish articles mostly in the English language as well as in the national language of the country (Table 5).

**Table 5. Linguistic analysis of the health and medicine journals**

No.	Languages	Number	Percentage
1	Monolingual	438	68.87
2	Bilingual	142	22.33
3	Trilingual	29	4.56
4	Four Languages	24	3.77
5	Five Languages	1	0.16
6	Six languages	2	0.31
	Total	636	100

## 6. Language Diversity

The Health and Medicine journals use 26 languages to publish the full-text of articles in which the majority of the journals (565, 88.83%) adopt the English language as a medium of publication followed by Castilian (83, 13.05%), Spanish (79, 12.42%), Portuguese (63, 9.90%), Indonesian (32, 5.03%) and Turkish (30, 4.71%) respectively (Table 6).

**Table 6. Language Diversity of the Health and Medicine Journals**

No.	Language	Number	Percentage
1	English	565	88.83
2	Castilian	83	13.05
3	Spanish	79	12.42
4	Portuguese	63	9.91
5	Indonesian	32	5.03
6	Turkish	30	4.71
7	Persian	17	2.67
7	Polish	17	2.67
8	Russian	16	2.52
9	French	7	1.10
9	German	7	1.10
10	Italian	4	0.63
11	Chinese, Hungarian, Korean, Ukrainian (4 languages)	2 each	0.31
12	Greek, Macedonian, Serbian, Arabic, Croatian, Japanese, Malay, Galician, Belarusian, Slovenian (10 Languages)	1 each	0.16
Total		26 Languages	

## 7. Article Processing Charges

The majority of journals do not charge any article processing charges (396, 62.26%) whereas 33.80 percent (215) journals do charge article processing fee. The journals that charge article processing fee are mostly published by the commercial publishers like Elsevier, Springer, Sage, and Wiley. The majority of the non-profit publishers (who charge article processing fee) have fee waiving option as well. These publishers waive off the article processing fee fully or partly to the authors in some cases (Table 7).

**Table 7. Article Processing Charges (APCs) of the Health and Medicine Journals**

No.	Article processing charges (APCs)	Number	Percentage
1.	Yes	215	33.80
2.	No	396	62.26
3.	No information	25	3.93
	Total	636	100

## 8. Licensing Patterns

The health and medicine journals adopt various forms of the Creative Common Licenses. The CC Licenses contain BY, NC, SA, and ND attributes. The CC BY is used by the maximum journals (264, 41.51%) followed by the CC BY-NC (144, 22.74%), CC BY-NC-SA (111, 17.45%) and CC BY-NC-SA (70, 11.01%) respectively. Few publishers (23) have framed their own licenses as well and they are included in the “Publishers own licenses” that form (3.61%) of total journals (Table 8).



**Table 8. Licensing patterns of the health and medicine journals**

S. No.	Type of License	Number	Percentage
1	CC BY	264	41.51
2	CC BY-NC	144	22.74
3	CC BY-NC-ND	111	17.45
4	CC BY-NC-SA	70	11.01
5	Publisher's own license	23	3.62
6	CC BY-SA	20	3.14
7	CC BY-ND	3	0.47
Total		636	100

## 9. Peer-Review Processes

Peer-review is the process in which the articles are first scrutinized / evaluated by the subject specialists before publication. It is evident that maximum journals in the DOAJ use “Double blind peer review” (265; 41.67%), followed by “Blind peer review” (180; 28.30%), “Peer Review” (173; 27.20%), “Open peer review” (17; 2.67%), and “Editorial review” (1; 0.16%) respectively (Table 9).

**Table 9. Peer-review processes of the health and medicine journals**

S. No.	Peer-review process	Number	Percentage
1	Double blind peer review	265	41.67
2	Blind peer review	180	28.30
3	Peer review	173	27.20
4	Open peer review	17	2.67
5	Editorial review	1	0.16
Total		636	100

## Discussion and Conclusion

The open access movement is gaining momentum all over the world. The open access journals have shown an exponential growth-rate irrespective of subject differences since the Budapest Open Access Initiative. The health and medicine journals show the same trend and the growth-rate of the journals varies from 200 percent to 350 percent within 15 years. Presently, less than 50 percent (75) countries of the world publish open access journals in the field of health and medicine. The academic and non-profit publishers in these countries have already adopted open access models for publication of journals. The academic and non-profit publishers of other countries can also join the open access movement and contribute in the field of health and medicine. The commercial publishers have also open gates to open access scholarly publishing. These publishers should keep the article processing charges (APCs) at the minimal especially in case of the health and medicine without focusing on the “Double Dipping” strategy.

The publishers should also encourage the Creative Common licenses that provide an opportunity for the maximum utilization of the contents. Besides, the health and medicine journals are published only in 26 languages and the journals available in other languages may also implement the gold road of open access in future. Therefore, it can be predicted that when more countries

and publishers will focus on open access models, the journals will increase at a much faster-rate. The availability and accessibility of the open access journals in the health and medicine to worldwide medical scientists free of cost will have the greater effect on human health and quality of life. It will help to prolong the life-span of humans worldwide and compete with the deadly diseases in the world. Open access is particularly valuable for developing countries which are deprived of accessing the latest medical information due to the limited financial resources. There is a wide gap between the developed and under-developed countries in terms of availability and accessibility to medical information including the advancement in medical technology and treatments, dividing them into information-rich and information-poor countries. There are many deadly diseases prevailing in the under-developed countries that have already disappeared from the developed countries. The open access to the health and medical information is a pre-requisite to a balanced development of the world.

The health and medicine journals registered in the DOAJ can be classified into three types- (a) General (publish articles on any branch of the health or/and medical sciences), (b) Specific (publish articles on specific branch of the health or/and medical sciences), and (c) Interdisciplinary (publish articles on any subject including the health or/and medical sciences). However, the present age is the age of specialization in the health and medical sciences, and it is fast moving towards super-specialization in the developed countries. All the medical scientists focus on their specializations or super-specializations. Therefore, the focus of the journal should be on a particular specialization. The health and medical information is produced at an unimaginable pace and the medical scientists cannot keep pace reading all journals and absorbing whole knowledge. The journals that focus on particular branches of the health and medicine can be more useful to these scientists. Besides, journals that focus on the specialized fields of knowledge can easily find experts for a peer-review process in that particular field. The expert of one specialization cannot do justice while reviewing the article in other areas. The scope of the journals should be limited to a specific branch of knowledge in the field of health and medicine. The health and medicine journals in the DOAJ undergo five types of reviews: (a) Double blind peer review (both the reviewer and the author are not specified), (b) Blind peer review (the identity of the reviewers are concealed from authors), (c) Peer review (articles are reviewed by the competent experts) (d) Open peer review (the identity of reviewers is disclosed to authors) and lastly (e) Editorial review (fixing typos, spelling, grammar, usage, or textual errors). The positive sign is that 99.84 percent of the journals are peer-reviewed and the quality of the articles is not compromised at all. However, the identification, motivation, and availability of the subject experts (peers) on a voluntary basis are the biggest challenges for the open access journals. Therefore, the medical scientists working in the government, public or private institutions need to volunteer themselves for these duties on a humanitarian basis. Their contribution in reviewing and improving the quality of information may act as a life-saving medicine for many humans.

## Future Research

The present research is primarily focused upon the quantitative analysis of the health and medicine journals. In future research, the attention should be given to quality control metrics like impact factor of journals and h-indexes of authors to have a better insight of the quality of journals in the field of health and medicine.

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