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Mapping of Research Output of “Health Information and Libraries Journal” (2001-2020)

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ABSTRACT

Aim: This bibliometric study aimed to assess various attributes of documents published in the *Health Information and Libraries Journal* (HILJ) from 2001 to 2020.

Design/Methodology: This was a retrospective study, performed on the publications output of *HILJ* from 2001 to 2020. The dataset was extracted from Elsevier’s Scopus database. The retrieved data were evaluated on the following bibliometric parameters; to examine the periodic growth of publications and citations, to analyze the authorship and collaboration patterns, to point out the productive authors, countries, most-cited documents, frequently used keywords and flow of knowledge. All types of documents were included for scrutiny, the documents published in 2021 were excluded as the year was not yet over. The data analysis was done by using the Microsoft Excel, VOSviewer, and Statistical Package of Social Sciences (SPSS).

Results: A total of 920 papers were identified in the targeted period with a Standard Error of Means (SEM) of 46 ± 2.48 , and an average annual growth rate of 4.96. These documents gained 12,107 citations (SEM 605.35 ± 141.77) with an average of 13.16 citations per document. The number of documents per year was varied from 34 to 68. The open accessed documents received a higher ratio of citations as compared to subscription-based documents. A positive correlation was found between the number of authors and citations. Two author pattern was dominated and about 75% of the documents consisted of articles type but the review papers got higher citation impact. The study found that the authors belonged to 130 countries contributed and 46.63% (n=429) of the total paper were contributed by the United Kingdom. The University of Sheffield and Andrew Booth were found the most prolific institution and author, respectively.

Conclusion: The present bibliometric study has demonstrated the significant findings, which help to map the research inclinations and potentially guides to the LIS professionals serving in medical libraries. *HILJ* has published substantial literature on health sciences librarianship contributed by 1,535 authors belonged to 113 countries of the world during the last two decades. The United Kingdom has been found a most productive country in terms of publications, while the United States on the top in citing the literature of *HILJ*.

Keywords; Bibliometric; Health Information and Libraries Journal; Research productivity, Medical librarianship, Scopus

INTRODUCTION

Journals are the important sources of scholarly and scientific communication, providing up-to-date, and current information with original findings to the scholars (Ullah, Butt & Haroon, 2008; Warriach & Ahmad 2016; Haq, 2021). The process of conducting research and sharing the results of investigations not only enhances the reserve of knowledge but also formulate new theories and provide multiple solutions to the existing problems (Haq, Elahi & Dana, 2019). Journals provide a platform and widely circulated communication channels for researchers in both print and online formats to share their research with the rest of the world. Library and Information Science (LIS) professionals along with their professional tasks of acquiring, managing and disseminating the learning resources for their respective communities also conducting valuable research to develop their profession (Haq & Alfouzan, 2019).

Over the period, the LIS professionals serving in special libraries have succeeded to develop their distinct branch and become a specialized subdivision of LIS. The medical librarianship is one of the significant branches of LIS, and medical librarians have been rendering their valuable supports in health care education, practice and research. Medical libraries exist in medical, dental, pharmaceutical and nursing colleges, universities, all kinds of hospitals, medical research centers, health ministries, and in the offices of medical associations (Haq & Ullah, 2014). Professional growth of any branch of knowledge including LIS discipline has been measured by multiple factors including, the number of quality research journals, reputed researchers and scholarly output in their respective fields (Siddique, et al., 2020). Medical Library Association came into being in 1898, and started a journal, named *Medical Libraries* (1898-1902), later it renamed as *Medical Libraries and Historical Journal* (1903-1907), and after the gap of some years, the first volume of *Bulletin of the Medical Library Association* (BMLA) was commenced in 1911, finally, it shaped as *Journal of Medical Library Association* (JMLA) in 2002 (Haiqi, 1995).

Health Information and Libraries Journal (HILJ), formerly known as *Health Libraries Review*, started its publication in 1984. *HILJ* is publishing under the flag of Health Libraries Group of the United Kingdom (UK) Chartered Institute of Library and Informational Professionals with the publishing house of John Wiley and Sons, and eminent LIS scientist, Maria J. Grant is the Editor-in-Chief since 2009 (Grant, 2019). It is prestigious and peer-reviewed journal that provides a podium for the interdisciplinary nature of research to medical and LIS practitioners, researchers and students. This journal has been indexed in all reputed databases, includes MEDLINE/PubMed, Clarivate Analytic-Web of Science and Elsevier's Scopus.

The journal has completed 37 years of publications as Maria J. Grant (2019) stated that *HILJ* is a leading health library and information journal, continues to grow, embracing the changes that happened in the health information domain. Further, she added that due to technology and health infrastructure, the medical information sector change beyond our imaginations, and the culture of sharing and learning has become an accepted norm of everyday life.

The journal has decent history, but no bibliometric study was found on the publication's growth except Murphy (2016) securitized the publication trends of 42 articles published during 2014-2015 in the *HILJ*. This study was limited to four issues of *HILJ* and discussed the geographical location of the authors. This bibliometric study was carried out to fill this knowledge gap. Alan Prichard (1969) coined the term bibliometric, in this technique the various characteristics, e.g. periodic growth, authorship and research collaboration pattern, subject dispersion and citation analysis, of publications are being measured through the application of statistics and mathematics. The celebrated method of bibliometric has been getting popularity due to the importance of evaluating the various properties of scholarly and scientific literature (Haiqi, 1995). The results of such studies help to understand the research trends and pattern of

citations that are useful to assess the journal itself and the related area of knowledge as well. The comprehensive bibliometric study support in the decision-making process, allocation of research grant and revisit the research policies (Javed, Ahmad & Khahro, 2020; Latif & Haq, 2020). The main aim of the paper is to present the different attributes of documents published in *HILJ* from 2001 to 2020 as reflected in the Scopus database.

REVIEW OF LITERATURE

The bibliometric study of a single journal can be considered as a case study on the patterns and trends of research for the particular area of knowledge (Kevin, Zainab & Anuar, 2017). This technique of evaluating the parameters of publications got popular during the 1980s (Garfield, 2009). Murphy (2016) reviewed the four issues consisting of 42 articles published in the *HILJ* during 2014-2015 to determine the share of authors and countries. The maximum articles were (57%) contributed by the developed western world, the United Kingdom was on the top with 14 articles while the rest of the world contributed 43% and the share of Africa was found significant (n=12). This study is restricted to four issues of *HILJ* and conversed the geographical location of authors.

Dimitroff (1992) evaluated the scholarly literature of *BMLA*. A total of 1,218 documents were published in *BMLA* for 25 years from 1966 to 1990. The study selected only 363 research articles for analysis and 25.3% of the articles were published during 1976-1980. Academic health sciences librarians contributed more than half (n=188; 51.8%) of the research whereas library schools shared 47 (12.9%) articles. The authorship pattern showed that 46% (n=168) of the articles were written by a single author and the ratio of authors per article was found, 1.85 authors. Collections, information retrieval, and education for librarianship were found the preferred area of subjects with 54, 39, and 30 articles respectively.

Haiqi (1995) examined the research trends of 410 articles of three medical library journals from 1990 to 1992. These journals were being published from three different countries, *Medical Information Services* (MIS) from China, *Journal of Japan Medical Library Association* (JJMLA) from Japan and *BMLA* from the United States. About one-fourth (24.59%) of the articles followed the descriptive / survey research method, followed by experiment/investigation (21.31%) and operation research (18.03%) methods. The 'retrieval of information' had been found the preferred area of the subject (n=16). The analysis of cited references showed that *BMLA* had the highest ratio of references, 13.14 references per article, whereas this ratio was recorded much less in *MIS* (5.91) and *JJMLA* (3.11). *MIS* had the highest number (20.91%) of journal self-citations, then *JJMLA* and *BMLA* with 16.31 and 13.21, respectively. Further Haiqi (1996) assessed the authorship pattern of 410 articles of these three journals during the same period in another study and revealed that 410 articles were written by 682 authors with an average of 1.66 authors per article, the mean authors' value was found higher in *BMLA* (1.97) as compared to *MIS* (1.74) and *JJMLA* (1.37). More than half (n=230; 56%) of the articles were written by a single author while 44% (n=180) were the results of multi-authors. The study also assessed the occupations of the authors, 79% were belonged to Library Sciences, whereas the health sciences, social sciences and others were counted 14.66%, 3.51% and 2.63%, respectively.

Kenefick and Warner (2011) evaluated the 428 articles of *Medical Reference Services Quarterly* (MRSQ) published from 1982-2009 with an average of 16 articles per year. These articles were contributed by 791 authors with a mean value of 1.84 authors per article and 75% of authors contributed in one article each. Sixty-eight percent of the authors belonged to academic health sciences libraries while the analysis of authors by gender showed that the female authors were counted as 82% of the total. A marginally more than half of the articles (n=218; 51%) were written by a single author pattern. *Dissemination and Information Retrieval* was found the preferred area of research. All the targeted

articles cited 4,388 references with an average of 10.25 references per article and majority of cited source (n=436) was *JMLA* and 255 (5.81%) references were considered as the self-citations of *MRSQ*.

Gore et al. (2009) evaluated the 474 articles published in *BMLA* from 1991 to 2007. The academic health sciences librarians contributed 55% of the articles. The analysis of the authorship pattern showed that more than one-third (n=180; 38%) of the articles were single-authored and 35% of the articles were cited more than 20 references. *Library users* (23.5%) was found the preferred area of research followed by *material or collection* (18.6%) and *public services* (11.7%). Survey research and bibliometric methods were counted 37% and 15.6% respectively.

Akers et al. (2018) analyzed the research collaboration trends of health sciences librarians with faculty members in *JMLA* from 2008 to 2017. Out of the total of 374 targeted papers, the research collaboration between librarians and faculty was found in 109 (29%) papers, however, 59% of the papers were only authored by librarians and 13% with no librarian authors. *Patient & consumer health information* (n=22), *clinical information-seeking & decision-making* (n=20) and *health sciences education* (n=20) were found the top three areas.

OBJECTIVES

1. To assess the periodic development of publications and citations
2. To measure the authorship and collaboration research patterns
3. To examine the types of documents with citation impact
4. To review the topmost authors, countries and documents
5. To scan the flow of knowledge channel

METHODOLOGY

This retrospective study was performed on all types of documents published during the last two decades from 2001 to 2020 in *HLIJ* and indexed in the Elsevier's Scopus database. The year 2021 was excluded as the year is not yet over. The dataset was retrieved on the 5th of April 2021. The bibliometric indicators of the data were analyzed on the distribution of documents and citations by year, authorship pattern, types of documents, examine the productive authors, organizations and countries, most-cited papers and analysis of the flow of knowledge. The findings have been shown in the table and graphic pattern. Microsoft Excel, VOSviewers and SPSS software were used to present the occurrence of co-authors and keywords clusters. The study has some limitations, first, the publications record indexed in the Scopus has been used, might be some records of the publications have been missed and secondly, the citations have also been taken from the same database.

RESULTS

Periodic Growth of documents and citations

A total of 920 documents (SEM 46±2.48) were identified by the Scopus database published in *HILJ* for 20 years from 2001 to 2020 with an average of 46 documents per year. The highest number of documents (n=68) were published in the year 2005 and the lowest number (n=34) were published in the year 2015. More than half of the documents (n=513; 55.76%) were published in the first decade from 2001 to 2010, while 44.24% (n=407) of the documents were published the second decade from 2011 to 2020. The maximum annual growth rate, 68.42 was recorded during the year 2004, followed by the year 2020, but collectively 4.96 was recorded the average annual growth rate (Table-1).

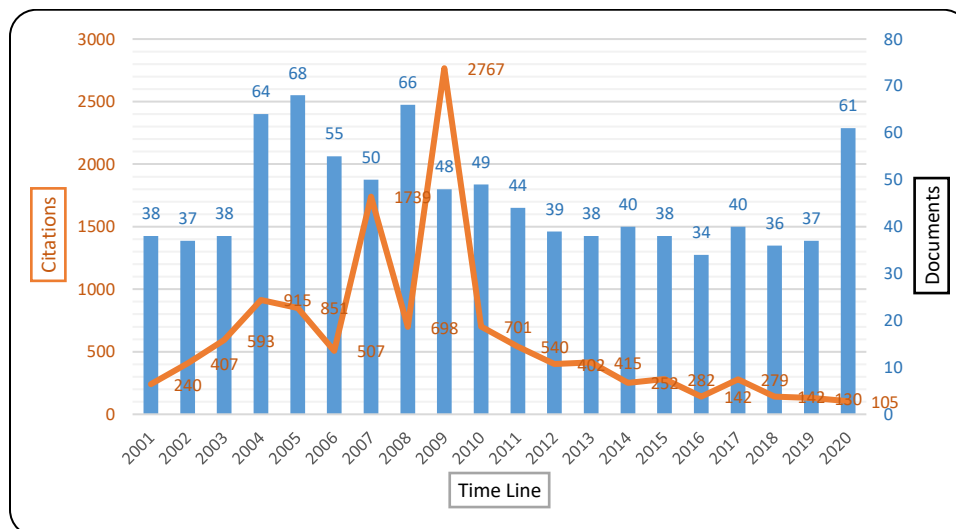
All the recognized (n=920) documents gained 12,107 citations (SEM 605.35±141.77) with a mean of 13.16 citations per document. The documents published in the first decade received 9,418 citations with

an average of 18.36 citations per document whereas the second decade's documents received 2,689 citations with an average of 6.60 citations per document. Figure-1 shows the longest peak with 2767 citations against the 48 documents published in the year 2009, it is because that the highly cited paper with 2335 citations was published in the same year.

A total of 2,226 authors including multiple entries contributed 920 documents with an average of 2.24 authors per document. The highest ratio of authors was found with 36 documents contributed by 142 authors with an average of 4.03 in the year 2018 and the lowest ratio was observed for 38 documents written by 67 authors with an average of 1.76 authors per document during the year 2003. The ratio of authors per paper was increased from 2.06 to 2.86 from the first decade to the second decade.

Table- 1, Distribution of documents, citations, annual growth rate, citations, total authors and average authors per document by year

Years	Documents	Citations	Annual Growth Rate	Citation Impact	Total Authors	Average authors per document
2001	38	240		6.32	74	1.95
2002	37	407	-2.63	11.00	81	2.19
2003	38	593	2.70	15.61	67	1.76
2004	64	915	68.42	14.30	128	2.00
2005	68	851	6.25	12.51	141	2.07
2006	55	507	-19.12	9.22	124	2.25
2007	50	1,739	-9.09	34.78	97	1.94
2008	66	698	32.00	10.58	128	1.94
2009	48	2,767	-27.27	57.65	108	2.25
2010	49	701	2.08	14.31	110	2.24
2011	44	540	-10.20	12.27	101	2.30
2012	39	402	-11.36	10.31	130	3.33
2013	38	415	-2.56	10.92	99	2.61
2014	40	252	5.26	6.30	124	3.10
2015	38	282	-5.00	7.42	124	3.26
2016	34	142	-10.53	4.18	100	2.94
2017	40	279	17.65	6.98	97	2.43
2018	36	142	-10.00	3.94	145	4.03
2019	37	130	2.78	3.51	99	2.68
2020	61	105	64.86	1.72	149	2.44
Total	920	12107	4.96*	13.16**	2,226	2.42***
Average	46	605.35				
St Dev	11.07	634.03				
SEM	2.48	141.77				
* Average annual growth rate, ** average citation per documents, *** average authors per documents						

Figure-1, Distribution of documents and citations by year

Distribution of documents by accessibility models with citation impact

Eighty-two percent (n=754) of the total documents received citations from one to 2335 times and considered citable documents till the date of data collection. One hundred and ten documents succeeded to gain one citation each, while 89 and 71 documents received two and three citations each respectively. Thirty documents received more than fifty citations each.

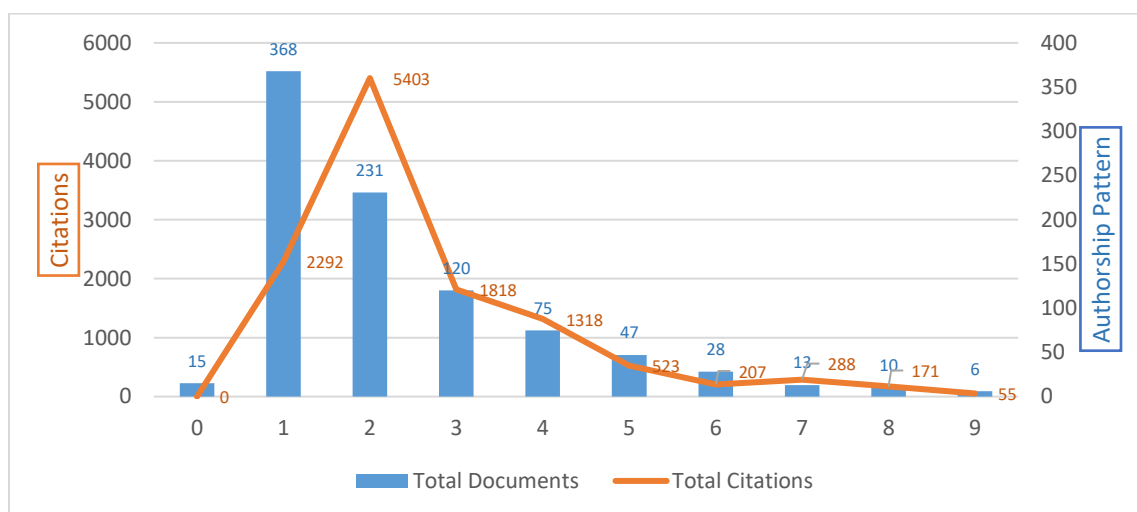
Two types of publishing models were found in the *HILJ*, one was the open access and the other was the subscription-based model. A slightly more than half of the documents (n=464; 50.44%) were open accessed and freely available to all users while 456 (49.56%) documents were not freely accessible and need a subscription to access the full text. All the open-accessed documents received 8,395 citations with an average of 18.09 citations per document, however, all the subscription-based documents received 3,712 citations with an average of 8.14 citations per document. The comparison of citable documents in open accessed and subscription-based revealed that 400 (86.20%) of were open accessed and 354 (63%) of subscription-based documents gained citations.

Authorship Pattern

Fifteen documents were published without the names of authors and these documents didn't receive any citation as well. Two-fifths (n=368; 40%) of the document were contributed by a single author pattern, while 58.36% (n=537) of the documents were the results of collaborative research design. The multi-author documents received the higher citation impact with 18.27 citations per document whereas the single-author documents gained 6.23 citations per document. A positive correlation (0.743807) was found as the number of contributors increased, similarly, there would be more chances to get attention in the shape of citations. Overall, the two-author pattern documents received the highest ratio of citations while seven documents were contributed by more than nine authors gained the lowest citation impact (Table-2 and Figure 2).

Table-2, Authorship Pattern with number of documents and citations

Authorship Patten	Total documents	Citable documents	Total citations	Citation impact
Without author	15	0	0	0
Single-author	368	260	2,292	6.23
Two-author pattern	231	205	5,403	23.39
Three-author pattern	120	112	1,818	15.15
Four-author pattern	75	74	1,318	17.57
Five-author pattern	47	42	523	11.13
Six-author pattern	28	25	207	7.39
Seven-author pattern	13	13	288	22.15
Eight-author pattern	10	10	171	17.10
Nine-author pattern	6	6	55	9.17
More than 9	7	7	32	4.57
Total/Average	920	754	12,107	13.16

Figure-2, Distribution of documents by authorship pattern versus citations

Segregation of documents by types

All documents were segregated into five types, almost three-fourth (n=687; 74.67%) of the total documents were consisted of article type, followed by review (n=110; 11.96%), editorial (n=80; 8.70%), short survey (n=27; 2.93%) and other types includes conference paper, erratum and notes (n=16; 1.74%). Although the type of 'article' consisted of almost 75% of the total documents, all these articles received 60.82% (n=7,363) of the total citations. The open accessed articles gained a higher citation impact (13.78) as compared to subscription-based articles (7.44). The review type of documents consisted of about 12% of the total but they gained 37.57% of the total citations with an average of 41.35 citations per review and the open accessed review papers gained the highest citation impact with 60.75 citations per review. The editorials, short survey and other documents (n=123; 13.26%) received 195 citations with 1.58 citations per document (Table-3).

Table-3, Segregation of documents by types and citations

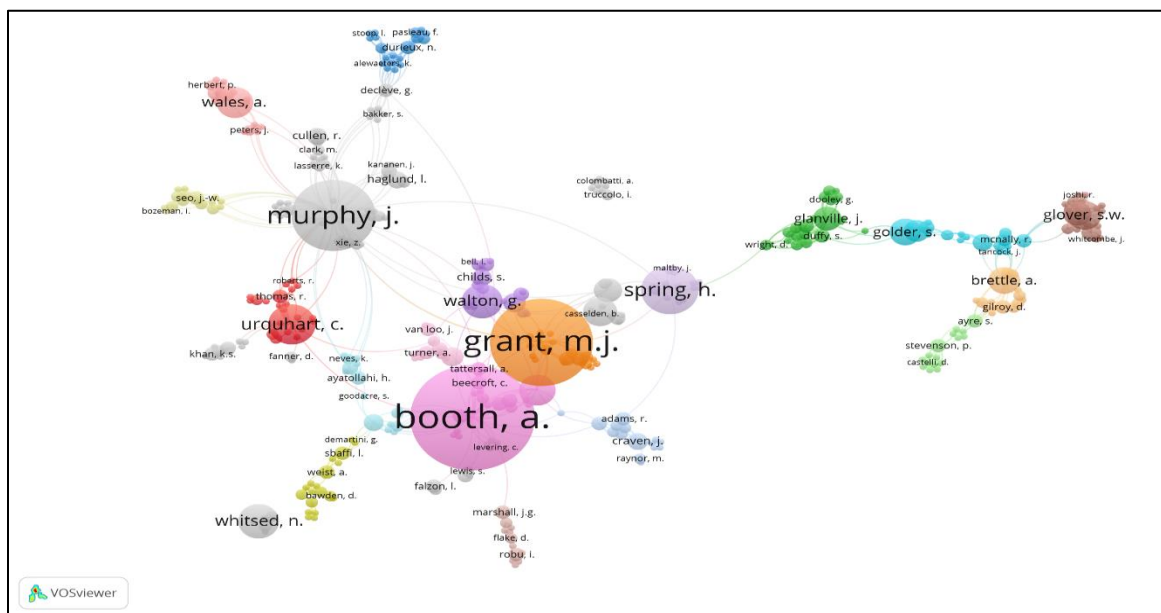
Type of document	Publishing Model	Total Documents	Citable Documents	Total Citations	Citation Impact
Article		687	587	7,363	10.72
	Open accessed	355	316	4,893	13.78
	Subscription-based	332	271	2,470	7.44
Review		110	105	4,549	41.35
	Open accessed	56	53	3,402	60.75
	Subscription-based	54	52	1,147	21.24
Editorial		80	36	96	1.20
	Open accessed	30	17	46	1.53
	Subscription-based	50	19	50	1.00
Short Survey		27	19	81	3.00
	Open accessed	17	12	51	3.00
	Subscription-based	10	7	30	3.00
Others (Conference Papers = 4, Erratum = 5, & Notes = 7)		16	7	18	1.12
	Open accessed	6	2	4	0.66
	Subscription-based	10	5	14	1.4

Most influential authors

As a unique and distinct, a total of 1535 authors identified, 1255 (81.75%) authors contributed in one document each, while 177 (11.53%) and 61 (3.97%) authors shared in two and three documents each, respectively. Only 42 influential authors contributed more than three papers each. The list of ten topmost ranked authors has shown in Table-4. Andrew Booth has been found a most prolific author with 64 documents, affiliated with the University of Sheffield, United Kingdom (UK), followed by Maria J. Grant of Liverpool John Moores University UK, Jeannette Murphy of University College London UK, and Hannah Catherine Spring of York St. John University UK, with 48, 35 and 20 documents, respectively. The VOSviewer software is used to visualize the co-occurrence network of authors. The largest set of connected authors consists of 402 authors in 32 clusters as shown in the Figure-3.

Table-4, Topmost ranked authors with number of contributions

Rank	Author's Name	Total Documents
1.	Booth, Andrew	64
2.	Grant, Maria J.	48
3.	Murphy, Jeannette	35
4.	Spring, Hannah Catherine	20
5.	Urquhart, C.	15
6.	Walton, G. & Whitsed, N.	12 each
7.	Sutton, A. & Wales, A.	10 each
8.	Glover, S.W. & Marshall, A.	9 each
9.	Brettle, A. & Golder, S.	8 each
10.	Bonnett, P., Glanville, J., Gleghorn, C. & Harrison, J.	7 each

Figure-3 Co-Occurrence of productive authors**Occurrence of Keywords**

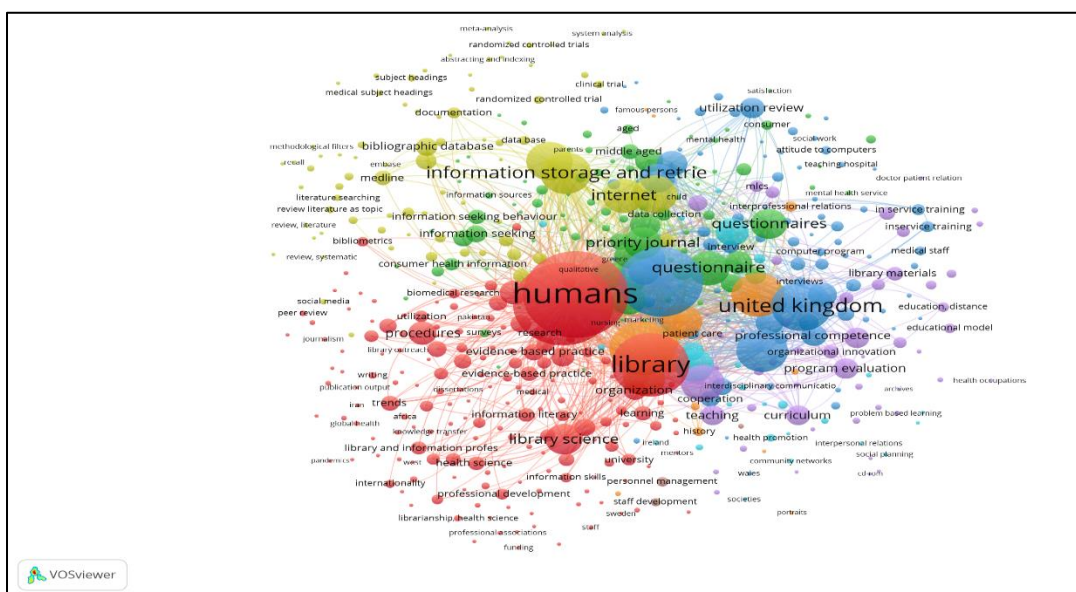
A total of 1,928 keywords were used in 902 documents and 854 (44.29%) keywords were used one time each, followed by 312 and 160 keywords with two and three times each respectively. The most frequently used 28 keywords with an occurrence rate of more than 100 times each have been shown in Table-5 with total link strengths. The keywords “Humans”, “Human” and “Article” were found 730, 685 and 523 times respectively. These top three keywords were occurred more than 500 time with more than 10,000 link strength. The keywords of “United Kingdom” and “Great Britain” were used 304 and 256 times, in total its counted 560 and become the third frequently used keywords. The VOSviewer software identified the largest co-occurrence network of 524 keywords consisted of 32 clusters and the first cluster has 168 keywords (Figure-4).

Table-5, Most frequently used keywords

Serial No.	Keyword	Occurrences	Total link strength
1.	Humans	730	15,040
2.	Human	685	14,036
3.	Article	523	10,821
4.	Library	456	9,120
5.	Libraries, Medical	356	7,056
6.	United Kingdom	304	6,176
7.	Great Britain	256	5,127
8.	Information Storage and Retrieval	230	4,823
9.	Organization and Management	229	4,912
10.	Information Retrieval	203	4,303
11.	Methodology	185	4,198
12.	Librarian	176	3,607
13.	Internet	172	3,654
14.	Education	169	3,897

15.	Librarians	168	3,496
16.	Priority Journal	165	3,349
17.	Library Science	161	3,118
18.	Questionnaire	153	3,682
19.	Library Services	149	3,198
20.	Evidence-Based Medicine	134	2,751
21.	Information Dissemination	128	2,897
22.	Standard	124	2,528
23.	Questionnaires	119	2,969
24.	Evidence Based Medicine	113	2,274
25.	Procedures	110	2,124
26.	Publication	108	2,112
27.	Female	105	2,724
28.	Information Service	103	2,332

Figure-4, Co-Occurrence of frequently used keywords



Most Contributing Countries

HILJ is being published from the UK, so the highest number of documents (n=429; 46.63%) were contributed by the authors affiliated with the UK, followed by the United States, Canada, Australia, and Iran with 91, 47, 34 and 15 respectively. Only 14 countries contributed 10 or more than 10 documents each as indicated in the figure-5. The authors belonged to 130 countries have shared their professional knowledge in *HILJ* during the last two decades, 48 countries contributed in more than one document each while 82 countries shared in one document each. VOSviewer software presented the co-occurrence network of countries in which the larger network consisted of 99 countries with 24 clusters presented in Figure-6.

Figure-5, Most contributing countries

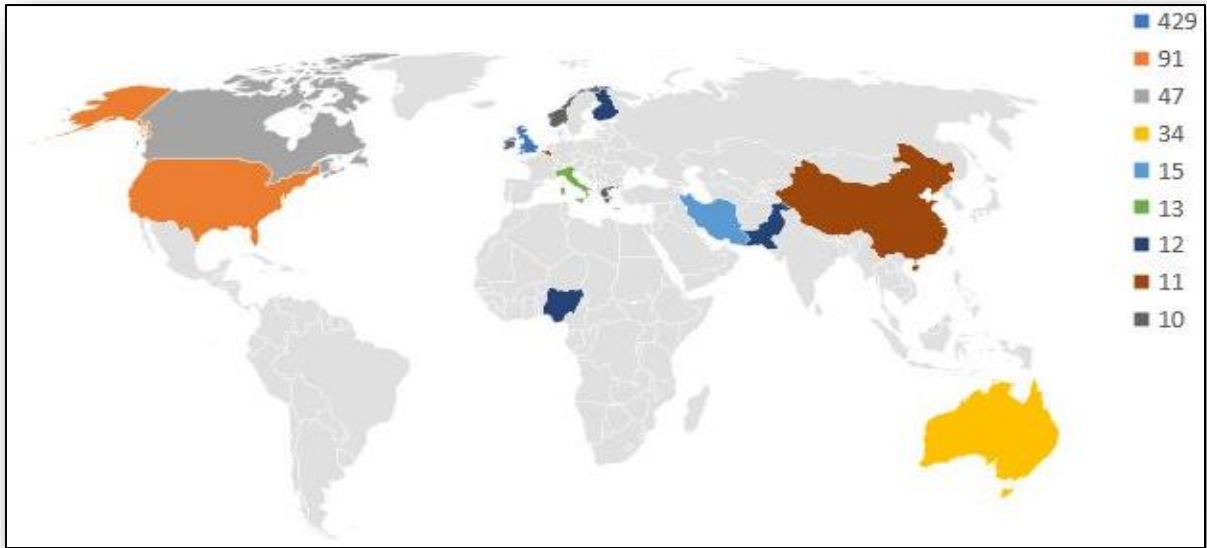
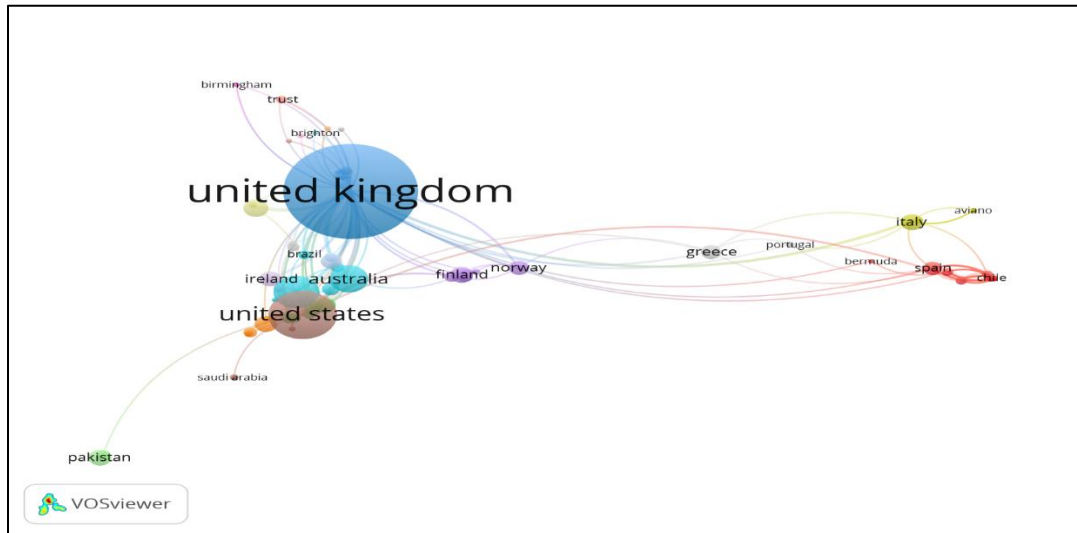


Figure-6, Co-Occurrence of contributing countries



Top-cited documents

There were 12 top-cited documents having more than 100 citations each and these documents gained a total of 4,661 citations with an average of 388.41 citations per document. The analysis of document types’ showed that these documents were consisted of six review papers and six articles. Three papers were contributed by a single-author pattern while nine were the results of the multi-author pattern. These highly-cited papers were published between the period of 2004 to 2010 and three papers each were published in 2004 and 2007. Five authors, Booth A, Kamel Boulos MN, Wheeler S, Hall A, and Walton G, were found with two papers each in most-cited documents. A review paper, entitled, “*A typology of reviews: an analysis of 14 review types and associated methodologies*” published in 2009 was found the most-cited document during the last two decades (Table-6).

Table-6, Details of 12 top-cited documents

Serial No.	Bibliographic Description of citations	Document Type	Total citations
1.	Grant, M. J., & Booth, A. (2009). A typology of reviews: an analysis of 14 review types and associated methodologies. <i>Health Information & Libraries Journal</i> , 26(2), 91-108.	Review	2335
2.	Kamel Boulos, M. N., & Wheeler, S. (2007). The emerging Web 2.0 social software: an enabling suite of sociable technologies in health and health care education 1. <i>Health Information & Libraries Journal</i> , 24(1), 2-23.	Article	645
3.	Boulos, M. N. K., Hetherington, L., & Wheeler, S. (2007). Second Life: an overview of the potential of 3-D virtual worlds in medical and health education. <i>Health Information & Libraries Journal</i> , 24(4), 233-245.	Article	429
4.	Childs, S., Blenkinsopp, E., Hall, A., & Walton, G. (2005). Effective e-learning for health professionals and students—barriers and their solutions. A systematic review of the literature—findings from the HeXL project. <i>Health Information & Libraries Journal</i> , 22, 20-32.	Review	235
5.	Davies, K. (2007). The information-seeking behaviour of doctors: a review of the evidence. <i>Health Information & Libraries Journal</i> , 24(2), 78-94.	Article	223
6.	Papaioannou, D., Sutton, A., Carroll, C., Booth, A., & Wong, R. (2010). Literature searching for social science systematic reviews: consideration of a range of search techniques. <i>Health Information & Libraries Journal</i> , 27(2), 114-122.	Article	122
7.	Ward, R., Stevens, C., Brentnall, P., & Briddon, J. (2008). The attitudes of health care staff to information technology: a comprehensive review of the research literature. <i>Health Information & Libraries Journal</i> , 25(2), 81-97.	Article	121
8.	Younger, P. (2010). Internet-based information-seeking behaviour amongst doctors and nurses: a short review of the literature. <i>Health Information & Libraries Journal</i> , 27(1), 2-10.	Review	118
9.	Jenkins, M. (2004). Evaluation of methodological search filters—a review. <i>Health Information & Libraries Journal</i> , 21(3), 148-163.	Review	116
10.	Weightman, A. L., & Williamson, J. (2005). The value and impact of information provided through library services for patient care: a systematic review. <i>Health Information & Libraries Journal</i> , 22(1), 4-25.	Review	108
11.	Spink, A., Yang, Y., Jansen, J., Nykanen, P., Lorence, D. P., Ozmutlu, S., & Ozmutlu, H. C. (2004). A study of medical and health queries to web search engines. <i>Health Information & Libraries Journal</i> , 21(1), 44-51.	Article	106
12.	Hall, A., & Walton, G. (2004). Information overload within the health care system: a literature review. <i>Health Information & Libraries Journal</i> , 21(2), 102-108.	Review	103

Flow of the Knowledge

A total of 13,148 references have been cited in 920 documents with an average of 14.29 references per document. Out of 12,107 citations, the bibliographic records of 9,321 citations were available in the Scopus database. Almost two-third (n=5998; 64%) of the *HILJ* items were cited in the open accessed documents while the share of the subscription-based document was counted 3,323 (36%). Twenty-one percent (n=1952) of the citations were received in the first eleven years from 2001 to 2011 and 79% of the citations were gained from 2012 to 6 April 2021. Andrew Booth and Maria J. Grant cited the documents of *HILJ* 76 and 48 times, respectively. The top-ten source titles, organizations and countries, frequently citing the literature of *HILJ* have been shown in Table-7. The self-citations of the journal and country were found 395 (4.23%) and 1,998 (21.43%) times, respectively.

Table-7, Detail of top ten source titles, organizations and countries whom cited the *HILJ* documents

Source Title	Qty*	Organizations	Qty	Countries	Qty
Health Information And Libraries Journal	395	The University of Sheffield	320	United States	2485
Journal of The Medical Library Association	179	University of Toronto	178	United Kingdom	1998
Journal of Medical Internet Research	142	McMaster University	128	Canada	1053
BMJ Open	88	Monash University	125	Australia	923
Library Philosophy and Practice	85	University of Alberta	111	Germany	349
Journal of Clinical Epidemiology	81	University College London	109	Spain	311
Medical Reference Services Quarterly	80	University of Ottawa	104	Netherlands	296
Evidence Based Library and Information Practice	77	University of Melbourne	97	China	273
Plos One	70	Université McGill	96	Italy	246
Studies In Health Technology And Informatics	62	The University of Western Ontario	93	South Africa	201

* Qty = Quantity or the number of citations

DISCUSSION

Health Sciences Libraries and LIS professionals have been providing their active and valuable support to the practitioners, faculty, researchers, and students related to medical and allied health professionals. It is estimated that 30% of the global scholarly literature is related to biomedical sciences (Johnson, Watkinson & Mabe, 2018, p.26). The LIS professionals serving in the health sciences libraries also contributing to research productivity to improve the library services and resources. The number of health sciences or medical library journals are being published around the globe and the plenty of international, national and regional medical library associations are functionals and providing learning & sharing opportunities to information professionals serving in these special libraries (Haq & Ullah, 2014).

One bibliometric study was found on *HILJ* (Murphy, 2016), whereas it is evident from the review of literature that numbers of bibliometric studies were carried out on *BMLA* (later become *JMLA*). The study on *HILJ* analyzed the four issues consisting of 42 articles published during 2014-2015. Most of

the research (57%) was produced by the developed western world while the rest of the world contributed 43% of the articles (Murphy, 2016).

Dimitroff (1992) evaluated the 363 research articles of *BMLA* published from 1966 to 1990. The authorship pattern showed that 46% (n=168) of the articles were written by a single author and the ratio of authors per article was found 1.85 authors. Haiqi executed two studies on 410 articles published in three medical library journals, (*MIS*, *JJMLA*, and *BMLA*) from 1990 to 1992 (Haiqi 1995; Haiqi 1996). In a 1995 study, the analysis of cited references showed that *BMLA* had the highest ratio of references, 13.14 references per article, as compared to *MIS* (5.91) and *JJMLA* (3.11). *MIS* had the highest numbers (20.91%) of journal self-citations, then *JJMLA* and *BMLA* with 16.31 and 13.21, respectively. In a 1996 study, he assessed the authorship pattern of the same 410 articles and revealed that these articles were written by 682 authors with an average of 1.66 authors per article, the mean authors' value was found higher in *BMLA* (1.97) as compared to *MIS* (1.74) and *JJMLA* (1.37). More than half (n=230; 56%) of the articles were written by a single author. Another bibliometric study on the 474 articles published in *BMLA* for 1991 to 2007 was done by Gore et al. (2009). The majority of articles (55%) were written by academic health sciences and more than one-third (n=180; 38%) of the articles were single-authored. Akers et al. (2018) studied the collaboration pattern between the health sciences librarians with faculty members in *JMLA* from 2008 to 2017 and the scale of this collaboration was found 29%. More than half of the papers (59%) were only authored by librarians. Kenefick and Warner (2011) performed a bibliometric study on 428 articles of *MRSQ*. The ratio of authors per article was recorded 1.84 while the female authors and single author pattern were dominated with 82% and 51%, respectively.

HILJ is considered a cherished source of communication amongst the health sciences LIS professionals around the world. The present bibliometric study covered the publication records of 20 years and the dataset was extracted from the world trusted the Scopus database. All types of documents were included in the analysis. A total of 920 documents were found with an average annual growth rate of 4.96 and about 75% of the documents consisted of article type, followed by reviews and editorial. A slight decline in the number of documents was observed in the second decades, as more than 55% of the documents were published from 2001 to 2010, while almost 44.24% were published during the second decade from 2011 to 2020.

The analysis of citations pattern offers an objective mode of evaluating the scholarly communication. All the chosen documents of *HILJ* gained 12,107 citations with an average of 13.16 citations per document. The open accessed documents received the highest number of citations, similarly the review papers much less in numbers as compared to articles, but their citation impact has been higher than articles. The authorship pattern showed that 40% of the documents were contributed by a single author but multi-author documents received a higher number of citations. In previous studies, a single author's documents were found a bit higher as 46% in Dimitroff's (1992) paper and 57% in Haiqi's (1996) research.

A total of 13,148 references were cited in 920 documents with an average of 14.29 references per document. The study on *BMLA* from 1991 to 2007 reported that the mean value of cited references per article was 19.1 (Gore et al., 2009). In fact, Gore et al. evaluated the research articles only that's why, the ratio of cited references was found higher. As far as our study is concerned, we included all types of documents, that reduced the ratio of references.

A total of 2,226 authors with multiple entries contributed 920 documents with an average of 2.24 authors per document. The proportion of authors per document was increased from 2.06 to 2.86 during the first and second decades respectively. In Dimitroff's (1992) and Haiqi's (1996) studies the mean value of author was 1.85 and 1.66, respectively. As a distinct author, 1,535 names of authors were identified in

HILJ, and almost 82% of the authors contributed in single document each and only 42% influential authors contributed in more than three documents each. Andrew Booth was found the most prolific author with 64 documents, followed by Maria J. Grant and Jeannett Murphy with 48 and 35 documents, respectively.

In the analysis of country affiliation, UK outclassed the rest of the world with 429 (46.63%) documents. It has been observed that the majority of the contributed in the journal belonged to the country, where the journal is being published. As in Kenefick and Warner (2011), the *MRSQ* is being published from the United States, large majority of the authors were affiliated to the United States.

The 12 most-cited papers of *HILJ* gained 4,661 citations with an average of 388.41 citations per paper. The examination of the flow of knowledge stated the detail of citations, which journal, institution and country have been frequently cited the literature of *HILJ*. It was exposed that the majority of citations (n=2,485) were generated from the United States, followed by UK (n=1,998) and Canada (n=1,053). The self-citations of the journal were counted 395, after *HILJ*, the bulk of citations come from *JMLA* (n=17).

LIMITATION AND FUTURE DIRECTION

This study was constructed on the dataset extracted from the Scopus database and might be a chance that some documents or their bibliographic details have been overlooked. Future researchers may analyze the subject dispersion and research methodologies of articles and review papers of *HILJ*. The detailed study of content would help to understand the history as well as the growth of the profession over the past four decades.

CONCLUSION

HILJ has been contributing noteworthy research and valuable scholarship for the development of health sciences librarianship. The study examined the bibliometric attributes of the 920 documents that were published in 37 years. The average number of documents per year was 51.3 during the first ten years (2001-2010), while in the next ten years (2011-2020), this ratio was recorded 40.7 but the 61 documents were published in the last year (2020) of study. The quality of documents is evident through the citation impact as all documents gained 12,107 citations with an average of 13.16 citations per document. An average of 2.42 authors per document was recognized but as a distinct author, a total of 1,535 authors that belonged to 113 countries of the world contributed 920 documents in 20 years. The finding of this study exposed that the UK is the most productive country but the United States has been on the top in citing the literature of *HILJ*.

REFERENCES

- Akers, K. G., Higgins, M., DeVito, J. A., Stieglitz, S., Tolliver, R., & Tran, C. Y. (2018). Collaboration between health sciences librarians and faculty as reflected by articles published in the Journal of the Medical Library Association. *Journal of the Medical Library Association: JMLA*, 106(4), 416-419.
- Dimitroff, A. (1992). Research in health sciences library and information science: a quantitative analysis. *Bulletin of the Medical Library Association*, 80(4), 340-346.
- Garfield, E. (2009). From the science of science to Scientometrics visualizing the history of science with HistCite software. *Journal of Informetrics*, 3(3), 173-179.
- Gore, S. A., Nordberg, J. M., Palmer, L. A., & Piorun, M. E. (2009). Trends in health sciences library and information science research: an analysis of research publications in the Bulletin of the

- Medical Library Association and Journal of the Medical Library Association from 1991 to 2007. *Journal of the Medical Library Association: JMLA*, 97(3), 203-11.
- Grant, M. J. (2019). 10 year anniversary. *Health Information and Libraries Journal*, 36(1):1-3.
- Haiqi, Z. (1995). A bibliometric study on articles of medical librarianship. *Information processing & management*, 31(4), 499-510.
- Haiqi, Z. (1996). Author characteristics in three medical library periodicals. *Bulletin of the Medical Library Association*, 84(3), 423-426.
- Haq, I. U. (2021). A Citation Analysis of Pakistan Library & Information Science Journal from 2004 and 2020. *Library Philosophy and Practice (e-journal)*, 5487.
- Haq, I. U., & Alfouzan, K. (2019). Pakistan library and information science journal; Bibliometric review of a decade (2008-2017). *Pakistan Library and Information Science Journal*, 50(2), 85-98.
- Haq, I. U., Elahi, G., & Dana, I. (2019). Research Publications on Medical Microbiology in Pakistan during the period 2013-2017. *Library Philosophy and Practice (e-journal)*, 2253.
- Haq, I., & Ullah, M. (2014). Development of Health Sciences Libraries and Medical Librarianship in Pakistan. *Pakistan Library and Information Science Journal*, 45(2), 49-57.
- Javed, Y., Ahmad, S., & Khahro, S. H. (2020). Evaluating the research performance of Islamabad-based higher education institutes. *SAGE Open*, 10(1), 2158244020902085.
- Johnson, R., Watkinson, A., & Mabe, M. (2018). *The STM report. An overview of scientific and scholarly publishing, 5th Ed.* STM: International Association of Scientific, Technical and Medical Publishers.
- Kenefick, C., & Werner, S. E. (2011). Bibliometric Study of Medical Reference Services Quarterly, 1982–2009. *Medical reference services quarterly*, 30(1), 1-11.
- Kevin, W. U. A., Zainab, A. N., & Anuar, N. B. (2017). Bibliometric studies on single journals: A review. *Malaysian Journal of Library & Information Science*, 14(1), 17-55.
- Latif, A., & Haq, I. U. (2020). Bibliometric research productivity analysis: A case study of Shifa Tameer-e-Millat University. *Journal of Shifa Tameer-e-Millat University*, 3(1), 49-55.
- Murphy, J. (2016). Global publication trends in the Health Information and Libraries Journal, 2014–2015. *Health Information & Libraries Journal*, 33(1), 82-83.
- Prichard A. (1969). Statistical Bibliography or Bibliometrics. *Journal of Documentation*, 25(4), 348-349.
- Siddique, N., Rehman, S. U., Khan, M. A., & Altaf, A. (2020). Library and information science research in Pakistan: A bibliometric analysis, 1957–2018. *Journal of Librarianship and Information Science*, 0961000620921930.
- Ullah, M., Butt, I. F., & Haroon, M. (2008). The Journal of Ayub Medical College: a 10-year bibliometric study. *Health Information & Libraries Journal*, 25(2), 116-124.
- Warriach, N. F., & Ahmad, S. (2016). Pakistan journal of library and information science: a bibliometric analysis. *Pakistan Journal of Information Management and Libraries*, 12.