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## **Quantitative Research of the Journal of Medical Library Association (JMLA) Publish during 2002-2020: A Bibliometric Analysis**

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### **Abstract**

The present study based on bibliometric analysis of Journal of Medical Library Association (JMLA) from 2002-2020 indexed in Scopus database. A total number of 1356 documents were published during the nineteen years from 2002 to 2020. All publication has been examined carefully to extend the data that year wise distribution of papers and citations, volume and issue wise distribution of documents and citation, authorship pattern, Average number of citations per paper, affiliation wise distribution, most cited countries, geographical distribution, top cited documents, occurrence index keyword analysis, co-citations countries, and author productivity. The study reveals that, during these 19 years, the journal has published the total number of 1356 papers with 16465 citations. Out of 1356 contribution, only 534 were single-authored and the rest were multi-authored with a Collaboration Index of 2.39.

**Keyword:** Citation Analysis, Bibliometric Study, Authorship Pattern, Geographical Distribution, Scopus, Journal of Medical Library Association (JMLA)

### **Introduction-**

Bibliometric and scientometric term is defined as the statistical analysis of published articles, books and other scientific documents and it is the effective way to measure scientific publications such as the impact of authors, publications, reference etc. It is one of the most studied areas in the field of Library and Information Science. A study of the LIS research trend in India noted that scientometric and bibliometric were the most frequently used keywords from 2014 to 2018. (Sahu & Parabhoi, 2020) The study of bibliometric and scientometric analysis evaluates the academic research output and shows the strength and weakness of the organizations. Bibliometric study in Library and Information Science has expanded significantly over the last two decades. Apart from the Library and Information science; some others field also have bibliometric research trends and progression. The bibliometric study has been compiled by various publications and studies such as research output of various institutes, organizations, faculty publications, the impact of journals, citations analysis, reference analysis etc. Now a day's citations analysis and bibliometric study design are some of the widely used technique to assess the impact of the article. (Iftikhar, Ali, et. all, 2019).

**Journal of Medical Library Association (JMLA)**

The Journal of the Medical Library Association (JMLA) is one of the premier journals in the field of health sciences librarianship which is an international peer-reviewed specialty journal. An aim of the journal is to advance the practice and research science knowledge-base of health sciences librarianship published by the Medical Library Association. JMLA comes in fourth times in a year (Quarterly), i.e, January, April, July, and October. The first volume (90) and its issues of the journal have been published in 2002. The Journal of the Medical Library Association (JMLA) publishes academically high-quality effective articles, another publication review, and some different subjects such as medicines, health informatics, social sciences, Library and information science, etc. It is continuously published high-quality work that advances research and evidence-based practice, library instruction in medical education, information literacy, and information behavior of cancer survivors and provides interchangeable value for readers, authors, and reviewers. In 2017, JMLA start publishing through Open Journal System (OJS) journal management and publishing platform hosted by the University of Pittsburgh, to take advantage of its relatively easy and strong workflows for manuscript submission, peer review, editorial decision making, and copyediting followed by the Medical Library Association citation style and it is indexed in Scopus and SJR.

### **Objectives of the Study**

The purpose of the present study is to quantify and assess the research activities of the journal of Medical Library Association to examine the research publication output during the period of Nineteen years (2002-2020). Hence the current study keeps the following key objectives:

- To identify the types of documents published in the Journal of Medical Library Association (JMLA) from 2002-2020.
- To know the Year, volume, issue-wise distribution and authorship pattern of articles.
- To identify the most productive authors and their citation impact.
- To identify the most frequent keyword used during this period.
- To study the most contributed and cited countries at the international level.
- To measure the most productive Institution/organization contribution and citation
- To identify the most cited articles and their citation.

### **Literature Review**

Singh, J. (2017) in his study paper entitled “Bibliometric analysis of DESIDOC Journal of Library and Information Technology during 2011-2015” reveal that 310 papers were published in 30 issues of 5 volumes during the period of study (20011-2015). The data were retrieved from the journal archival websites. The study reveals that 70 maximum numbers of articles are published in 2013 and 127 (22.01%) the maximum number of authors are contributed to the 70 number of articles in 2012. 502 (78%) most of the authors are from India and 22 % are foreign authors. B.M. Gupta has published the highest number of articles 13 (2.25%) in the journal during the study. The maximum 204 (65.81%) articles have a length of 6-10 pages. 77 (24.84%) paper cited 6-10 references and also cited 11-15 references. Maximum 54 (17.24%) articles cover the area of digital, online and e-resources in the journal during the period of study.

Bharti and Meera (2015) in their research paper entitled "A bibliometric study of SRELS journal of information management through Indian Citation Index (ICI) during 2004-2012" reveals that 407 papers were published in the journal and getting 4796 citations during the study period. The data were retrieved from the Indian Citation Index citation (ICI) database and study the number of authors, type of documents, author(s) affiliation, country/state of origin of the documents, number of citation, length of the article, etc. It reveals that out of 407 articles maximum of 67 papers contributed in 2012 with the highest 794 citations. The maximum number of reference per articles is 6-10 (34.64%) and 215 articles have the maximum length in the range of 6-10 pages. The majority of 353 (86.73%) papers had published in the form of research articles. The highest number of articles 209 (51.35%) are contributed by the double authors compared to a single author. It is also found the most papers are contributed from Karnataka and mostly used reference source is journals.

Senthilkumar, R. and Ulaganathan, G. (2015) conducted a bibliometric study on library and information science journals from (2008-2014) in which a total of 2837 research articles were published in the particular journal in the field of Library and information Science and their corresponding citations and self-citation as indexed in Indian Citation Index (ICI). The study reveals the details of 17 Indian library science journals that have been indexed in ICI with regards to their rank, year-wise distribution, number of publications, a record of citations, self-citation and other parameters and found that out of the 17 Indian library science journals indexed in ICI, Annals of Library and Information Studies (ALIS) one of the leading Indian LIS journals started its publication in the year 1954 by NISCAIR, followed by DESIDOC Journal of Library & Information Technology (DJLIT) in 2008.

Shukla, R. and Verma, M.K. (2019) in their study paper entitled "Research productivity of the journal of Knowledge and Communication Management (JKCM) from 2011-2017: a bibliometric analysis" tries to measure authorship pattern, degree of collaboration, distribution of articles, most prolific contributors, author productivity, etc. and found that the majority of articles are contributed in the journal is 16 (17.39%) published in the year 2015 and 2017 and the highest articles are contributed by two authored and degree of collaboration is found to be 0.81. The geographical distribution shows that contribution of India is the highest and K.M. Shibu was the most prolific author who contributed 5 (17.85%) articles.

Suresha, G.P. and Narayanaswamy, B.V. (2016) in their research paper entitled "Information Research: South African Journal of Library and Information Science (2005-2015): A bibliometric study" tries to measure the authorship pattern, citation analysis, length of contributors, geographical distribution, thematically expertise of contribution, etc. It reveals that a total of 179 contributions had published in the journal during the period 2005-2015. The maximum number of papers were contributed by two authored and 233 (73.68%) males were the contributed highest in the journal. It also found the highest number of articles had published in the area of information communication technology 37 (20.67%) and most of the staff from technological Universities were contributed 90%. The geographical distribution shows that contribution of South Africa was the highest and commonly most of the authors preferred 2876 (45.83%) conference article refer to write their research articles.

## **Scope and Limitation**

The present study covers the articles published in the Journal of Medical Library Association (which began in 2002). The extent of the investigation is bound to a restricted range of Nineteen years, i.e. 2002-2020. The 1<sup>st</sup> volume of this Journal was published in the year 1898 with the name of Medical Libraries and again it was renamed more than twice. Finally, in the year 2002, the journal was renamed the Journal of Medical Library Association (JMLA) and continue to till date. So, in this study, the investigator considered only those documents which are published in the Journal of Medical Library Association (JMLA) from the year 2002 to 2020.

## **Methodology**

This study is based on the articles published in the Journal of Medical Library Association (JMLA) for a period of Nineteen years, i.e. from 2002-2020. The data was retrieved from the Scopus database which is the world's largest abstract and citation database of peer-reviewed literature and quality of web sources on May 23, 2021. During the period of investigation total numbers of 1356 documents and 16465 citations were retrieved from 76 issues of 19 volumes of the journal marked during the period of examination (2002-2020). The data has been organized, calculated, tabulated, analyzed in MS-Excel, Vos viewer and R programming software for evaluation by using simple arithmetic and statistical methods to find its results and presented in the form of tables and graphs.

## **Data Analysis:**

### **Year Wise Citation of Documents:**

Table 1 shows that, the year-wise distribution of documents and citations in the selected period (2002-2020) of the journal. The number of articles varies from year to year and as per the examination. It shows a total of 1356 articles published in a given period. Out of a total of 1356 documents, the maximum contribution of 89 papers (6.56%) was seen in the year 2019 and 2020 and the least contribution of 54 papers (3.98%) was made in the year 2014. A total of 16465 citations are found appended to 1356 papers. From table 1, it can be noted that the highest number of citations appeared in the year 2006, i.e., 2146 citation constituting 25.85 average citations followed by 1945 citations constituting 24.01 average citation which appeared in the year 2005. And the least number of citations, i.e., 64 citation constituting 0.71 average citations appeared in the year 2020.

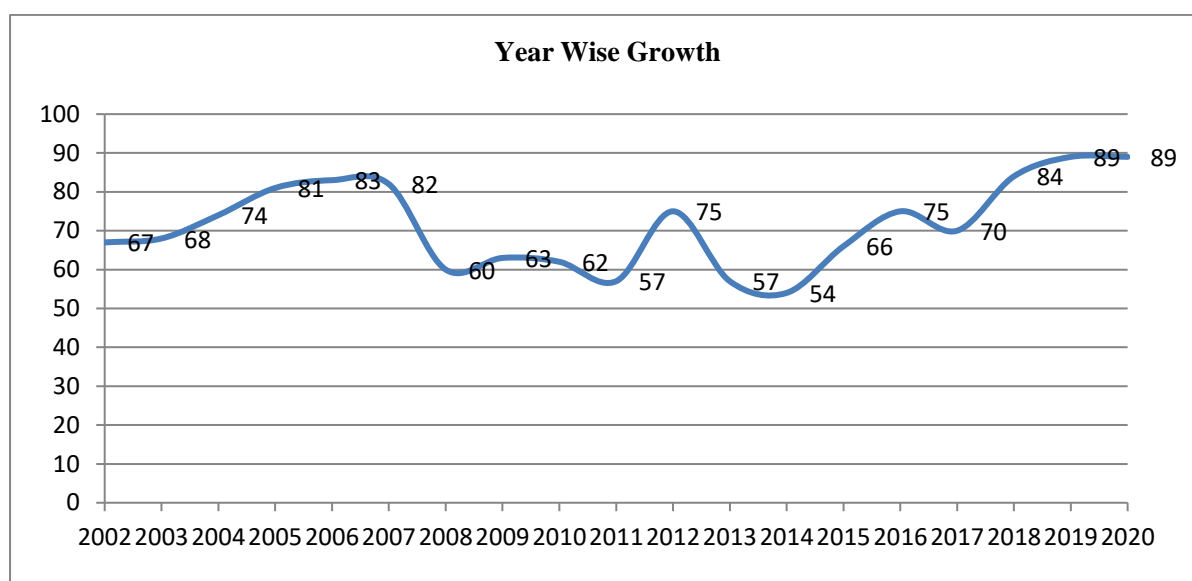
**Table - 1:Year Wise Distribution and Citation of Documents**

<b>Year</b>	<b>Documents</b>	<b>Documents %</b>	<b>Total no. of Citations</b>	<b>Average no. of Citation</b>
2002	67	4.94	1214	18.11
2003	68	5.01	1184	17.41
2004	74	5.45	1414	19.10
2005	81	5.97	1945	24.01
2006	83	6.12	2146	25.85
2007	82	6.04	975	11.89
2008	60	4.42	762	12.70
2009	63	4.64	1105	17.53
2010	62	4.57	594	9.85
2011	57	4.20	798	14.00
2012	75	5.53	581	7.74
2013	57	4.20	627	11.00
2014	54	3.98	596	11.03
2015	66	4.86	575	8.71
2016	75	5.53	718	9.57
2017	70	5.16	382	5.45
2018	84	6.19	562	6.69
2019	89	6.56	223	2.50
2020	89	6.56	64	0.71
<b>Total</b>	<b>1356</b>	<b>100%</b>	<b>16465</b>	

**Year Wise Growth of Publications:**

The figure-1 shows that the growth of publication during the period from 2002-2020. It reveals that the highest number of publications were published in 2019 and 2020 respectively. There are 1356 publications found during the analysis period. The figure shows that most publications of this study are in pick level with 89 publications in the year 2019 and 2020. The growth of publication is in a zigzag motion. It is continuously increased from 2002 to 2006 and continuously decreased from 2007 to 2011. Again, the publication growth continuously increased from 2017 to 2020 and reached 89 publications. it was a good symbol for research to increase the publications.

**Figure – 1: Year-wise Growth of Publication**



**Volume and Issue wise Publications of Documents:**

Table-2 shows that the contribution of articles (volume-wise) in JMLA during the period (2002-2020). It shows that a total of 1356 publications were published in 19 volumes. The highest number of articles 89, constituting (6.56%) were published in 2019 and 2020 (Vol. 107 and 108) with 64 and 223 citations followed by 84, constituting (6.19%) research results are published in the year 2018 (Vol.106) and got 562 citations. 83 publications were published constituting (6.12%) in 2006, (Vol. 94) and got the highest no. of 2146 citation followed by 82 articles, constituting (6.04%) were published in the year 2006 (Vol. 95) with 975 citations. And the least no. of document 54, constituting (3.98%) were published in 2014 (Vol. 102) and got 596 citations. The data has been analyzed and presented in the form of table 2 for interpretation.

**Table- 2: Volume and Issue wise Publications of Documents**

Publication details		No. of Contributions				Total	Percentage %	Citation	Average Citation
Year	Volume	Issue 1	Issue 2	Issue 3	Issue 4				
2020	108	25	21	18	25	89	6.56	64	0.71
2019	107	14	24	19	32	89	6.56	223	2.50
2018	106	24	20	14	26	84	6.19	562	6.69
2017	105	20	17	15	18	70	5.16	382	5.45
2016	104	17	18	16	24	75	5.53	718	9.57
2015	103	18	13	15	20	66	4.86	575	8.71
2014	102	11	15	15	13	54	3.98	596	11.03
2013	101	12	12	16	17	57	4.20	627	11.00
2012	100	16	16	14	29	75	5.53	581	7.74
2011	99	18	11	15	13	57	4.20	798	14.00

2010	98	20	17	16	09	62	4.57	594	9.58
2009	97	17	17	12	17	63	4.64	1105	17.53
2008	96	13	14	16	17	60	4.42	762	12.70
2007	95	19	17	30	16	82	6.04	975	11.89
2006	94	13	31	18	21	83	6.12	2146	25.85
2005	93	25	14	15	27	81	5.97	1945	24.01
2004	92	15	22	15	22	74	5.45	1414	19.10
2003	91	16	19	16	17	68	5.01	1184	17.41
2002	90	21	15	17	14	67	4.94	1214	18.11
<b>Total</b>		<b>334</b>	<b>333</b>	<b>312</b>	<b>377</b>	<b>1356</b>	<b>100</b>	<b>16465</b>	<b>100</b>

### Authorship Pattern:

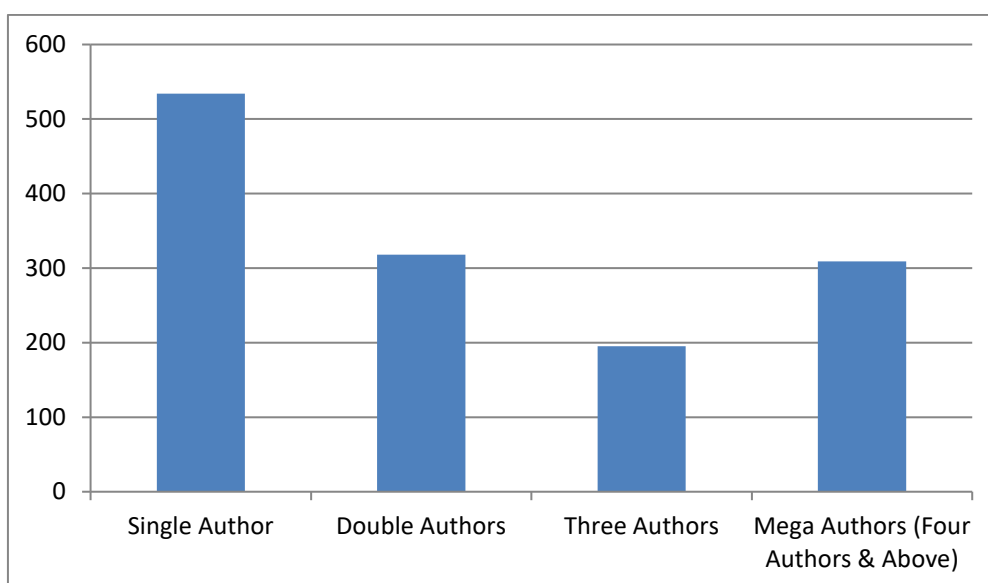
Table-5 and figure-2 show that the Authorship pattern of total cited documents a total number of 16465 citations were analyzed to determine the authorship pattern of cited documents, where single authors contributed the highest number 534 (39.38%) work. 318 (23.45%) work contributed by double authors followed by 309 (22.78%) works by mega authors and the least number of contributed 195 (14.38%) by three authors from a total number of papers 1356. The authorship pattern in this study indicates that three authored papers are most dominant in the Journal of Medical Library Association (JMLA).

**Table - 3: Authorship Pattern**

Authorship Pattern	Total Paper	Percentage (%)
Single Author	534	39.38
Double Authors	318	23.45
Three Authors	195	14.38
Mega Authors (Four Authors & Above)	309	22.78
<b>Total</b>	<b>1356</b>	<b>100</b>



**Figure - 2: Authorship Pattern of Articles**



**Types of Documents:**

Table-3 reveals that articles of publication have been published in a variety of document types. The highest number of documents has published in the form of research articles 835 with 10770 citation constituting (65.41%). 132 articles published in the form of the conference paper with 2603 citation constituting (15.80 %) followed by 121 papers has published in the form of review article with 2337 citation constituting (14.19%). And the least number of document type is retracted published only one with 33 citations constituting (0.20%) followed by short survey with only Seven (7) article with 18 citations constituting (0.10%).

**Table- 4: Documents types of Publication and Citation**

Types of Documents	No. of Publications	Total No. of Citations	Percentage %
Article	835	10770	65.41
Conference Paper	132	2603	15.80
Editorial	80	237	1.43
Erratum	42	3	0.01
Letter	53	71	0.43
Note	85	393	2.38
Retracted	1	33	0.20
Review	121	2337	14.19
Short Survey	7	18	0.10
<b>Grand Total</b>	<b>1356</b>	<b>16465</b>	<b>100</b>

**Most Productive Author:**

Table-4 shows that the most productive author is T.S. Plutchak contributed 21 papers whose citations are 116 constituting ACPP 5.52 and its rank as per ACPP is 9 followed by N.B. Giuse contributed 20 papers with 291 citations constituting ACPP 14.55 and got rank as per ACPP is 2. Similarly, M.R. Tennant is the least productive authors who contributed the 11 papers and whose citations is 110 constituting ACPP 10.00 and got rank 3 as per ACPP. K.M. Alpi achieved the sixth position as per ACPP with 17 papers having 138 citations constituting ACPP is 8.11 followed by S. Starr contributed 16 papers with 95 citations constituting 5.93 ACPP and got 8<sup>th</sup> position as per ACPP. There are two authors, i.e. K.G. Akers and J.D. Eldredge contributed the same 15 papers having 51 and 141 citations constituting ACPP 3.40 and 9.40 and got rank as per ACPP are 10 and 5. It is also indicated that I.D. Cooper contributed 13 papers with citations 128 constituting ACPP is 9.84 and got ranked 4 as per ACPP.

**Table -5: Most Productive Author**

Author	h-index	g-index	m-index	NP	TC	ACPP	Rank as per ACPP
Plutchak, T.S.	6	10	0.316	21	116	5.52	9
Giuse, N.B.	9	16	0.474	20	291	14.55	2
Alpi, K.M.	6	11	0.375	17	138	8.11	6
Starr S.	4	9	0.25	16	95	5.93	8
Akers K.G.	3	6	0.6	15	51	3.40	10
Eldredge J.D.	7	11	0.316	15	141	9.40	5
Cooper, I.D.	3	11	0.375	13	128	9.84	4
Epstein B.A.	5	9	0.263	12	93	7.75	7
Shipman J.P.	5	12	0.263	12	181	15.08	1
Tennant M.R.	6	11	0.3	11	110	10.00	3

ACPP= Average Citation Per Paper; TC= Total Citation; NP= Number of Publications

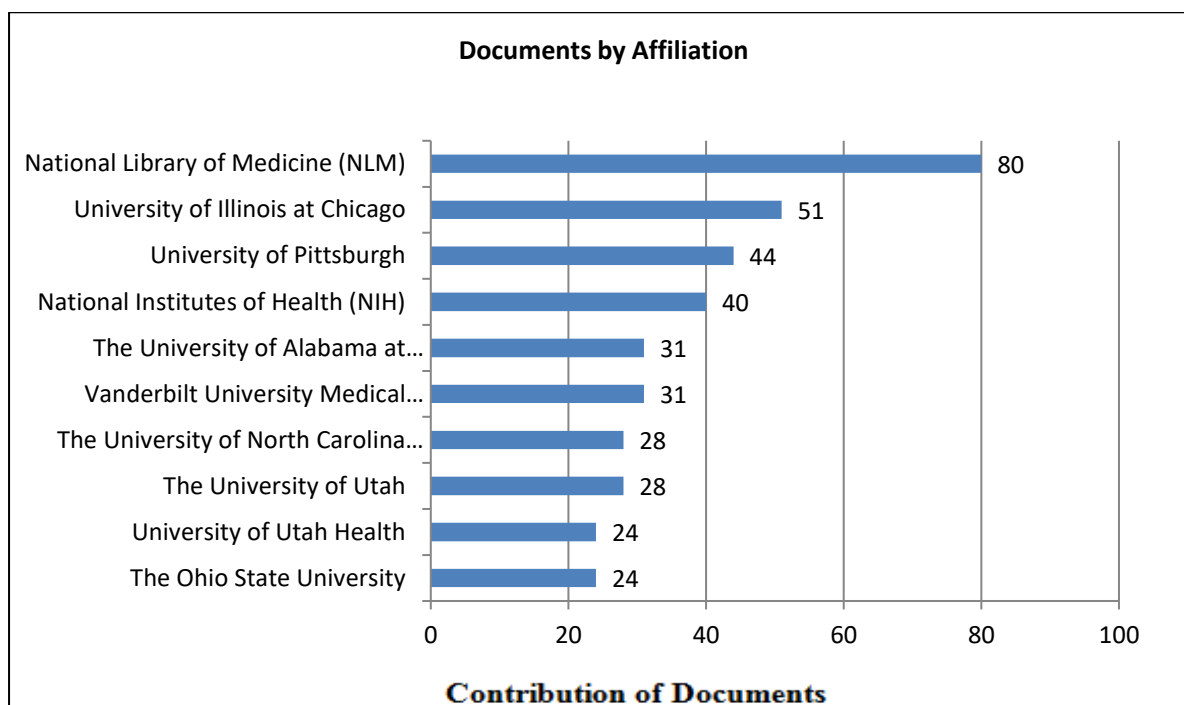
**Documents by Affiliations:**

Table-6 and figure-3 show that the National Library of Medicine (NLM) has contributed 80 papers constituting average contribution (5.89) and received 849 citations whereas the University of Illinois at Chicago 51 papers constituting average contribution (3.76) and receive 777 citations. The University of Pittsburgh contributed 44 papers constituting (3.24) of average contribution and received 798 citations followed by the National Institutes of Health (NIH) contributed 40 constituting (2.94) of average contribution has 562 citations. There are two universities, i.e. The University of Alabama at Birmingham and Vanderbilt University Medical Center contributed 31 papers constituting (2.28) of average contribution having 150 and 346 citations respectively. And the Ohio State University and the University of Utah Health has contributed the least number of papers 24 constituting (1.76) of average contribution having 288 and 275 citations.

**Table - 6: Documents contributed by Affiliation**

Rank	Affiliation	Contribution of Documents	Percentage (%)	Total Citation
1	National Library of Medicine (NLM)	80	5.89	881
2	The University of Illinois at Chicago	51	3.76	777
3	University of Pittsburgh	44	3.24	798
4	National Institutes of Health (NIH)	40	2.94	562
5	The University of Alabama at Birmingham	31	2.28	150
6	Vanderbilt University Medical Center	31	2.28	346
7	The University of North Carolina at Chapel Hill	28	2.06	339
8	The University of Utah	28	2.06	301
9	The Ohio State University	24	1.76	288
10	University of Utah Health	24	1.76	275

**Figure – 3: Contribution of Documents by Affiliation**



### Countries wise contributed Documents and Citations:

Table-7 shows that the documents contributed by the countries worldwide during the period from 2002 to 2020. It reveals that, the highest number of papers 1067 contributed by the USA whose citation is 11469 constituting an 11.34 average citation. Similarly, Canada has contributed 86 number of papers whose citation is 1634 constituting 19.00 average citation followed by the United Kingdom contributed 32 number of papers with 1128 citation whose average citation is 35.25. The Netherlands contributed 16 papers with 640 citations constituting 40.00 average citations followed by Australia contributed 13 papers with 300 citations. There are two countries, i.e. France and Spain contributed the same 9 number of papers with 146 and 210 citations constituting of average citation 16.22 and 23.33. And Slovenia has contributed 4 number papers with 52 citations. It is also indicated that the two

countries, i.e. Iran and Japan are contributed the least 3 papers with citations 10 and 116 having 3.33 and 38.66 average citations.

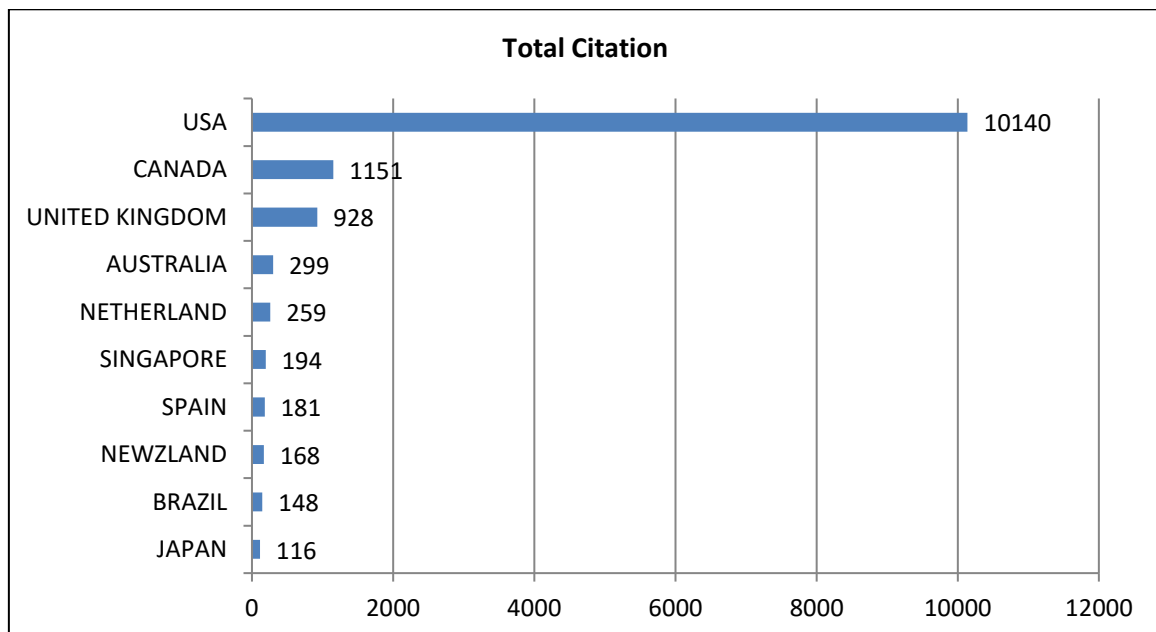
**Table - 7: Countries wise contributed Documents and Citations**

Sl. No.	Country	Documents	Total Citation	Exclude Self-citation of all authors	Average Citation
1	USA	1067	12103	11033	11.34
2	CANADA	86	1634	1579	19.00
3	UNITED KINGDOM	32	1128	1037	35.25
4	NETHERLANDS	16	640	611	40.00
5	AUSTRALIA	13	300	266	23.07
6	FRANCE	9	146	136	16.22
7	SPAIN	9	210	193	23.33
8	SLOVENIA	4	52	45	13.00
9	IRAN	3	10	10	3.33
10	JAPAN	3	116	110	38.66

**Most Cited Country:**

The figure-4 shows that, the total 16465 number of citations from the top ten countries during the period from 2002-2020. This study reveals the most cited country is the USA with 9468 citations and achieved the top level from the other countries. This figure is in the bar chart to shows the total citation and cited by the different countries. It is continuously decreased from Canada to Japan and reached 10140 to 116 citation of the publications. And the least cited country is Japan constituting 116 citations.

**Figure –4: Most Cited Countries**



**Top Ten Cited Paper:**

Table- 8 shows that the top-cited papers were found from 2002 to 2020. The table reveals that the highly cited papers found in an article entitled “How to identify randomized controlled trials in MEDLINE: ten years on” by Glanville J.M., Lefebvre C., Miles J.N.V., and Camosso-Stefanovic J. got the first position and received 471 citations published on 2006 in a conference paper. It is followed by “Impact factor: A valid measure of journal quality?” by author Saha S., Saint S., and Christakis D.A. cited by 392 times in 2003 and achieved the second position. The article “Avoiding versus seeking: The relationship of information seeking to avoidance, blunting, coping, dissonance, and related concepts” by Case D.O., Andrews J.E., Johnson J.D., and Allard S.L. cited 340 times in 2005 which published in Review paper followed by Wong S.S.-L., Wilczynski N.L., Haynes R.B. entitled “Developing optimal search strategies for detecting clinically sound treatment studies in EMBASE” whose citation is 201 and the paper published in a conference paper on 2006. There are two papers are getting the same citation, i.e. 141 entitled paper “Brimful of STARLITE”: Toward standards for reporting literature searches” authored by Booth A. published in an article on 2006 and “Systematic reviews need systematic searchers” authored by McGowan J., and Sampson M. published in a conference paper on 2005 respectively.

**Table - 8: Top Ten Cited Documents**

Rank	Author	Title	Year	Citations	Documents
1	Glanville J.M., Lefebvre C., Miles J.N.V., Camosso-Stefinovic, J.	How to identify randomized controlled trials in MEDLINE: Ten years on	2006	471	Conference Paper
2	Saha S., Saint S., Christakis D.A.	Impact factor: A valid measure of journal quality?	2003	392	Article
3	Case D.O., Andrews J.E., Johnson J.D., Allard S.L.	Avoiding versus seeking: The relationship of information seeking to avoidance, blunting, coping, dissonance, and related concepts	2005	340	Review
4	Wong S.S.-L., Wilczynski N.L., Haynes R.B.	Developing optimal search strategies for detecting clinically sound treatment studies in EMBASE	2006	201	Conference Paper
5	Coumou H.C.H., Meijman F.J.	How do primary care physicians seek answers to clinical questions? A literature review	2006	199	Conference Paper
6	Bramer, W.M., Giustini, D., De Jong, G.B., Holland L., Bekhuis T.	De-duplication of database search results for systematic reviews in endnote	2016	196	Article
7	Majid S., Foo S., Luyt B., Zhang X., Theng Y.-L., Chang Y.-K., Mokhtar I.A.	Adopting evidence-based practise in clinical decision making: Nurses' perceptions, knowledge, and barriers	2011	194	Article

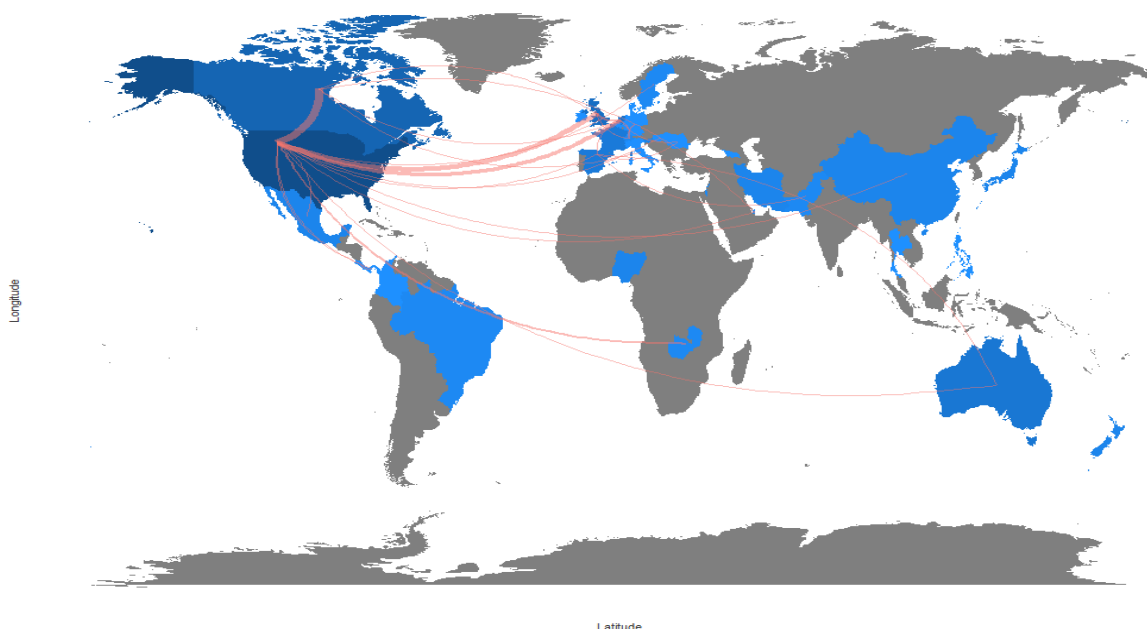
8	Adams N.E.	Bloom's taxonomy of cognitive learning objectives	2015	179	Article
9	Boruff J.T., Storie D.	Mobile devices in medicine: A survey of how medical students, residents, and faculty use smartphones and other mobile devices to find information	2014	155	Article
10	Booth A.	Brimful of STARLITE": Toward standards for reporting literature searches	2006	141	Article
11	McGowan J., Sampson M.	Systematic reviews need systematic searchers	2005	141	Conference Paper

### Country Scientific Production:

The figure-5 shows that the distribution of publications by geographical area of the Journal of Medical Library Association (JMLA) from 1999-2020. The map represents the contribution of collaborators of the researcher in India as well as others countries. In this map, the red curved line represents the researcher's contribution of journal articles and others documents by countries such as the USA, Canada, United Kingdom and Australia and among others. It also represents the strength of the collaboration between countries. The USA has the highest numbers of contributed documents during the study period.

**Figure-5: Country collaboration Map**

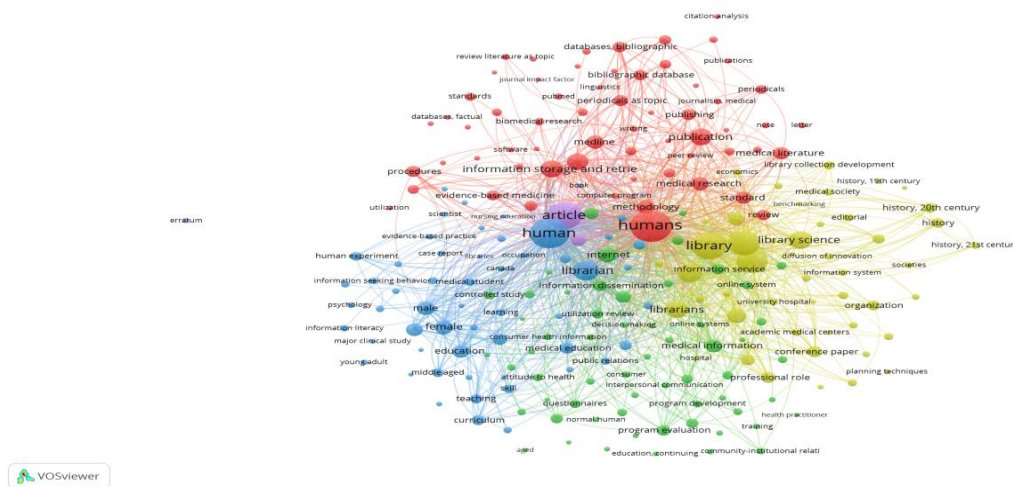
Country Collaboration Map



### Co-occurrence Keywords:

Figure-6 indicates that the analysis of Co-occurrence Keywords during the period 2002-2020. The study found a total of 2532 keywords used with a minimum number of occurrence 20 keywords during the study period. The total 224 numbers of keywords to be selected with the greatest link strength and the total strength of the co-occurrence links with others keywords. The font size and the background colour of the different nodes represent the highest numbers of keywords occurrence. The most frequently used keyword was "Humans" with 964 times occurrence and the link strength is 15128 and next most frequently occurring keywords being Human, Article, Library, United State etc.

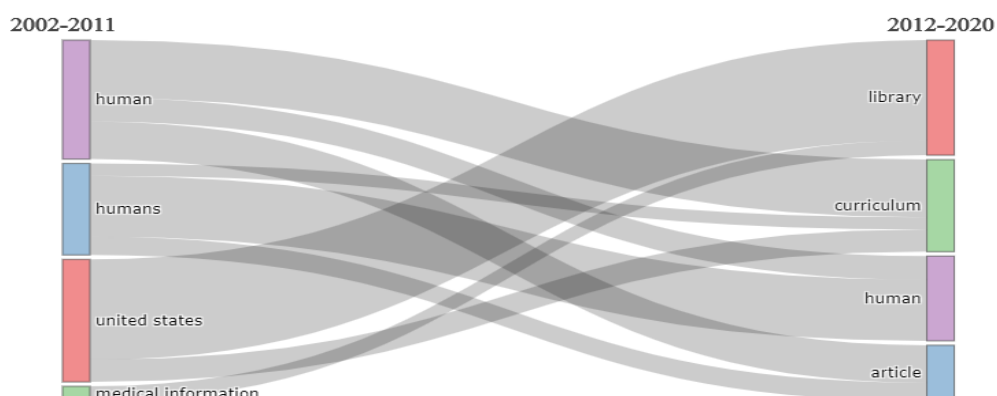
Figure-6: Co-occurrence Keywords



### Thematic Evaluation-

The figure-7 find out the thematic evaluation of the researcher's output of the JMLA Journal during the study period from 2002-2020. All the keywords have been divided into two parts and considered with a time interval for the years 2002-2011 and 2012-2020. A maximum number of 100 keywords have been considered with 4 clusters and it observed that during the period 2002-2011 Pink synthesis (Human) has been merged with heterocyclic compounds. Similarly, the "Library" keyword was maximum used during the year 2012-2020.

Figure-7: Thematic Evaluation



## Conclusion:

Journal of Medical Library Association (JMLA) is playing a vital role in the field of medical library and information science. Medical professional, Library professional, teachers, research scholars, etc. are willing to contribute their research papers in this journal. The present study has analyzed the research contributions of the past nineteen years during 2002-2020. During the analysis, it is found that the highest number of contribution, i.e. 89 (6.96%) were published in the year 2019 and 2020. Most of the publications were contributed by a single author 534 (39.38%). The highest number of citation 2146 found in Vol. 94 in the year 2006. Out of 16465 citations, 10770 (65.41%) citation appeared in articles. Most of the papers 1067 were contributed by the USA whose citation 11469 followed by Canada with 1634 citation. Most of the papers were published in the Article form followed by Conference paper. Whereas most prolific author is Plutchak, T.S. who contributed the 21 papers with 116 citations. National Library Medicine (NLM) has contributed the highest number of papers 80 (5.89%) and the top cited paper published in the year 2006 with 471 citation entitled "How to identify randomized controlled trials in MEDLINE: Ten years on" by Glanville J.M. Most frequently keyword "Humans" was used 964 times and occurring keywords being Human, Article, Library, United State etc. Hence the journal rich its information content in the field of health science librarianship to increase the visibility and readability of the literature along with new research specialization being continued in the research field. The study has highlighted the various bibliometric measures that can be used to understand the reflection of the character of the literature and journal.

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