International Journal of Information Movement *Vol.I Issue V (September 2016)*
Website: ijim.in ISSN: 2456-0553 (online) Pages 79-87

BIBLIOMETRIC ANALYSIS OF MEDICAL JOURNALS

Qaisar Ahmad Lone
E-mail: Loneqaisar8@gmail.com

Tahir Ahmed Batt
Instructor / Library Assistant
SKUAST-K, Shalimar -191201
E-mail:tahirbatt2015@gmail.com

Javed Ahmad Bhat
E-mail:javed.bhat@gmail.com

Abstract: This paper presents a bibliometric analysis of the two open access medical Journals namely The Indian journal of Pathology and Microbiology and Bosnian Journal of Basic Medical Science for the period between 2010 to 2014. The analysis cover mainly the number of articles, authorship pattern, subject wise distribution of articles, average number of references per articles, forms of documents cited, year wise distribution of cited journals etc. All the studies point towards the merits and weakness of the journal which will be helpful for its further development. A total of 2314 Publications were harvested pertaining to both Journal titles. Out of which 281 belonged to Bosnian Journal of Basic Medical Sciences and 1033 belonged to Indian Journal of Pathology and Microbiology.

Keywords: Bibliometrics, Citation analysis, Web of science, The Indian Journal of Pathology and Microbiology, The Bosnian Journal of Basic Medical Sciences.

1.0 Introduction:

Research is an activity based on objective verifications and involves innovative works instead in order to reveal something novel which in turn helps to add to existing domains of knowledge (**Cauvery et al, 2007).** Research as such commonly refers to search for new knowledge and can also be defined as scientific and systematic search for pertinent information on a specific topic. The key purpose of basic research is documentation, clarification, discovery, development and advancement of human knowledge. In the broadest sense research comprises any collection of data, information and facts for the development of knowledge **(Rajasekar, Philominathan & Chinnathambi, 2013)**. According to **Abbott and Doucouliagos, (2003)** research in particular is regarded as an important indicator of scientific progress and competitiveness of a nation**.** These research contributions can be in different forms like books, journal articles, reviews and reports **(Okafor & Dike, 2010).** So studies like analysis of research output, Bibliometric studies, Citation analysis etc are important for understanding Knowledge representation, intellectual structures along with information seeking and utilization patterns. Bibliometric studies measure the quantity and impact of scientific publication and are based on count of scientific papers and citations they receive. The Research impact is clearly indicated by analyzing the citations received by a particular publication over specific period of time **(King, 1987).**

2.0 Bibliometrics

Pritchard (1969) defines Bibliometrics as the application of mathematics and statistical methods to books and other media of communication. **Nicholas and Ritchie (1978)** define Bibliometrics as a method of providing information about the structure of knowledge and the means of its communication. They further added that Bibliometric studies fall mainly into two broad groups, describing characteristics or features of a literature (descriptive studies) and those examining the relationship formed between the components of literature (behavioral studies). **Broadus (1987)** further defines Bibliometrics as a quantitative study of physically published units or of bibliographic units or of surrogates of either. It is the use of quantitative analysis and statistics to describe the patterns of publication within a given field of literature and include methods to quantitatively analyze scientific and technological Literature (**Ma, 2005).** Bibliometrics evolved into a distinct scientific discipline with a specific research profile, several subfields and the corresponding scientific communication structures which include

publication of the international journal Scientometrics in 1979 as the first periodical specialized on Bibliometric topics, international conferences since 1983, the journal Research Evaluation since 1991.The main reason for this development can be seen in the availability of large bibliographic databases in machine-readable form and the fast development of computer science and technology **(Noyons, 1999; Glanzel, 2003)**. **Henderson, Shurville and Fernstorm (2009)** commented that Bibliometrics are now used in quantitative research assessment exercise of academic output.The assembling and interpretation of statistics relating to books and periodicals to demonstrate historical movements, to determine the national or universal research use of books and journals, and to ascertain in many local situations the general use of books and journals **(Pritchard, 1969)**.

The current study is carried to conduct the bibliometric study of two quarterly peer reviewed journals in the field of medical sciences indexed through web of science. The two journals are Indian journal of Pathology and Microbiology & Bosnian journal of basic medical sciences. The study period was confined to the time frame of 2010-2014 to maintain uniformity and accuracy for comparisons.

3.0 Web of Science (http://wokinfo.com/)

Web of Science has become the gold standard for research discovery and analytics by meticulously indexing the most important literature in the world. It connects publications and researchers through citations and controlled indexing in curetted databases spanning every discipline. It helps users in using cited reference search to track prior research and monitor current developments in over 100 year's worth of content that is fully indexed, including 2.6 million records and back files dating back to 1898.It helps to get comprehensive and relevant coverage in order to Identify hidden patterns and gain insight into emerging research trends. The present study as such attempts to carry Bibliometric study of two open access medical Journals namely The Indian journal of Pathology and Microbiology and Bosnian Journal of Basic Medical Science having quarterly periodicity.

4.0 The Indian journal of Pathology and Microbiology

The Indian Journal of Pathology and Microbiology is the official Quarterly publication of the Indian Association of Pathologists and Microbiologists. It had completed 50 years in the year 2007. The Journal was started the in the year 1958. Initially the journal was called Indian Journal of Pathology and Bacteriology and the present name is in existence from the year 1965. The journal grew over the years. The journal is widely read and is in almost all the libraries of the country and in many institutions outside the country. From the year 2008, the article submission, review, correspondence and publication process has been made online (www.journalonweb.com/ijpm). Now the journal has its own website (www.ijpmonline.org). With these changes the visibility and popularity of the journal has tremendously increased. Dr S Satyanarayana is the present editor of the journal. The journal is indexed with Abstracts on Hygiene and Communicable Diseases , CAB Abstracts, Caspur, CNKI (China National Knowledge Infrastructure), DOAJ, EBSCO Publishing's Electronic Databases, ExcerptaMedica / EMBASE, Expanded Academic ASAP, Genamics Journal Seek, Global Health, Google Scholar, Health & Wellness Research Center, Health Reference Center Academic, Hinari, Index Copernicus, Indian Science Abstracts, IndMed, Journal Citation Reports, MEDLINE/Index Medicus, National Science Library, Open J Gate, Primo Central, Pro Quest, Pub Med, Science Citation Index, Science Citation Index Expanded, Scimago Journal Ranking, SCOLOAR, SCOPUS, SIIC databases, Summon by Serial Solutions, Tropical Diseases Bulletin, Ulrich's International Periodical Directory and Web of Science.

5.0 Bosnian Journal of Basic Medical Science (BJBMS)

The Bosnian Journal of Basic Medical Sciences (BJBMS is an international, English-language, quarterly open access peer reviewed journal, published by the association of basic medical sciences of federation of Bosnia and Herzegovina. BJBMS welcomes original research and comprehensive reviews as well as short research communications in the field of molecular biology, biochemistry, genetics, immunology, microbiology, pathology, pharmacology, pharmaceutical sciences, physiology and translational research. Bosnian Journal of Basic Medical Sciences is indexed and abstracted in the following scientific databases and repositories: Pub Med, Science Citation Index Expanded, Journal Citation Reports, EMBASE/ Excerpta Medica, SCOPUS, Chemical Abstracts Service, EBSCO, DOAJ, CAB abstracts, Global Health, Index Copernicus International, HINARI, Bio Info Bank Library, Europe Pub Med Central.

6.0 Problem

Research activities are being supported and carried out with good pace in different subject areas particularly in the fields associated with Science and Technology .The increase in specific research activities led to the development of more specialized areas within different subjects. Biomedical Research stands at the forefront in this endeavor where quality research output has become an index for measuring progress and development. The availability of qualitative literature in the open access Journals has greatly influenced the methods of information seeking and publishing .Medical science has visibly adopted open access mode of publishing to a greater extent with good number of full text qualitative articles made accessible through open access journals. Bibliometric study facilitates the understanding of the structure of knowledge and the means of its communication adopted by authors while carrying different research activities. These studies indicate the quality, quantity, maturity and productivity of a particular subject. The present study therefore makes an attempt to carryout Bibliometric study of two select open access journals in the field of medical sciences.

7.0 Scope

The scope of the study is limited to the Bibliometric study of two select open access journals in the field of medical sciences namely "Indian Journal of Pathology and Microbiology" and "Bosnian Journal of Basic Medical Sciences" covering the volumes published in both the titles from 2010-2014.

8.0 Objectives

The objectives of the study are:

1. To identify two Open Access Journals in the field of Medical Sciences.
2. To determine the authorship patterns adopted in different contributions.
3. To assess the productivity in different publication categories.
4. To analyze the citations behavior in publication categories.

9.0 Methodology

For Objective 1 Web of Science was used to identify two open access journals having same periodicity and language in the field of medical science titled "Indian journal of pathology and Microbiology & Bosnian journal of basic medical sciences". For objective 2-4 the two identified online open access journals were consulted to reveal the trends in publications types, authorship patterns, citation behavior etc. The data was examined to reveal the facts about trends in publications, geographical distributions of authors, most contributed publication types, and citations received by different publication types etc to draw necessary inferences and conclusions.

10.0 Data Analysis

The **data Analysis** is carried under two Journal Titles separately and a comparative assessment is shown at the end.

10.1 Bosnian Journal of Basic Medical Sciences

10.1.1 Country Wise Distribution of Contributions :

The collected data was scattered over a good number of countries with many countries having high productivity and others with meager contributions during 2010-2014. In order to make the study more useful only first 20 most productive countries were included in the analysis. Table 1 indicates that among those countries, Bosnia and Herceg maintains the lead with a total of 120 publications over the period of 5 years followed by China, Turkey, Serbia and Iran with 45, 32, 27 and 12 publications respectively. The lowest contributions are from Czech Republic, France, Qatar, and Saudi Arabia with 3, 2, 2 and 1.Year 2010 appears to be the most productive year having publications numbering 100 (35.58%)out of total publications that is 281 followed by the year 2011 i.e. 51 (18.14%) respectively.

Table 1. Country wise Distribution of Contributions

COUNTRY	2010	2011	2012	2013	2014	Total
BOSNIA & HERCEG	59	17	13	16	15	**120**
CHINA	16	9	10	6	4	**45**
TURKEY	2	4	1	12	13	**32**
SERBIA	1	13	2	5	6	**27**
IRAN	0	1	8	2	1	**12**
CROATIA	7	1	0	0	0	**8**
SLOVENIA	3	1	3	0	1	**8**
MALAYSIA	0	0	6	0	1	**7**
MACEDONIA	3	1	0	1	0	**5**
PAKISTAN	2	2	0	1	0	**5**
JAPAN	2	1	0	1	0	**4**
CZECH REPUBLIC	0	1	0	0	2	**3**
FRANCE	2	0	0	0	0	**2**
SAUDI ARABIA	2	0	0	0	0	**2**
QATAR	1	0	0	0	0	**1**
Total	**100 (35.58%)**	**51 (18.14%)**	**43 (15.30%)**	**44 (15.65%)**	**43 (15.30%)**	**281**

10.1.2 Top Most Author Contribution (Country Wise): The analysis of contributions from authors pertaining to different geographical locations from top twenty countries it was revealed that the top most author contributions are from Bosnia and Herceg with 527 authors out of 1308 over the period of 5 years (2010-2014) followed by China, Turkey, Serbia, and Iran with 234, 156, 142, 66 authors respectively. The lowest numbers of authors are from France, Qatar, and Saudi Arabia with 13, 6, and 3 authors respectively. Year 2010 is most productive year in terms of author contributions with 434 (33.14%) authors followed by year 2014 with 240 (18.34%) authors (Table 2).

Table 2.Top Most Author Contributions (Country Wise)

COUNTRY	2010	2011	2012	2013	2014	Total
BOSNIA & HERCEG	260	63	56	67	81	527
CHINA	88	49	47	31	19	234
TURKEY	2	12	2	64	76	156
SERBIA	2	63	8	23	46	142
IRAN	0	2	47	15	2	66
CROATIA	35	10	0	0	6	51
MALAYSIA	0	0	30	0	5	35
SLOVENIA	3	6	9	0	5	23
JAPAN	8	5	0	6	0	19
MACEDONIA	8	5	0	6	0	19
PAKISTAN	6	6	0	2	0	14
FRANCE	13	0	0	0	0	13
QATAR	6	0	0	0	0	6
SAUDI ARABIA	3	0	0	0	0	3
Total	**434 (33.18%)**	**221 (16.89%)**	**199 (15.21%)**	**214 (16.36%)**	**240 (18.34%)**	**1308**

10.1.3 Year Wise Distribution of Publication Types

While analyzing the total number of publications in different categories from 2010-2014.Over the period of 5 years out of total 299 publications, the leading contributions are in terms of articles i.e. 257 (85.95%), followed by meetings 18 (6.08%)and editorials 17 (5.68%). The lowest publication types include Reviews, Letters, Corrections, and Biographies with 3 (1.00%), 2 (0.66%), 1 (0.33%) and 1 (0.33%) respectively. The overall trend during different years is the same while in case of meetings, corrections and Biographies the only contributions can be seen during 2010.While as letters have been contributed only in 2012 and 2013 (Table 3).

Table 3.Year Wise Distribution of Publication Types

PUBLICATIONS	2010	2011	2012	2013	2014	TOTAL
ARTICLES	76	47	42	44	48	257
MEETINGS	18	0	0	0	0	18
EDITORIALS	4	4	4	4	1	17
REVIEWS	0	1	2	0	0	3
LETTERS	0	0	1	1	0	2
CORRECTIONS	1	0	0	0	0	1
BIOGRAPHY	1	0	0	0	0	1
TOTAL	**100 (33.44%)**	**52 (17.39%)**	**49 (16.38%)**	**49 (16.38%)**	**49 (16.38%)**	**299**

10.1.4 Overall Distribution of Citations : Table 4 reveals overall citations received by different contribution types during 2010-2014 with articles being highly cited at 132 (92.95%) followed by Meetings with 10 (7.04%).The publication categories including editorials, corrections and biographies numbering to 147 contributions have received no citations. It is evident from the data that most of the contributions received single citations 62 (43.66%), followed by more than three citations 36 (25.35%) with a clear lead in article category.

Table.4. Overall Distribution of Citations (2010-2014)

	SINGLE	DOUBLE	TRIPLE	MORE THAN THREE	TOTAL	ZERO
ARTICLES	55	27	16	34	132	122
EDITORIALS	0	0	0	0	0	17
MEETINGS	7	2	1	2	10	6
CORRECTIONS	0	0	0	0	0	1
BIOGRAPHY	0	0	0	0	0	1
TOTAL	**62**	**29**	**17**	**36**	**142**	**147**

11.0 Indian Journal of Pathology and Microbiology

11.1 Country Wise Distribution of Contributions:

Table 6 reveals that among the top most 20 productive countries India maintains a clear lead with 831 publications over the period of 5 years followed by Iran, Turkey, Pakistan and USA with 45, 43, 24 and 16 Publications respectively. The lowest contributions are from Singapore, Nepal and France with 1 from each. Furthermore 2010 appears to be most productive year in terms of publications numbering 294 (28.46%) followed by 2011 with 251 (24.29%) and 2014 with 194 (18.78%) publications respectively.

Table 6. Country Wise Distribution of Contributions

COUNTRY	2010	2011	2012	2013	2014	Total
INDIA	234	195	129	103	170	831
IRAN	15	12	10	4	4	45
TURKEY	9	16	9	3	6	43
PAKISTAN	12	6	5	1	0	24
USA	2	7	1	4	2	16
China	0	0	5	0	9	14
MALAYSIA	4	1	4	1	0	10
SAUDI ARABIA	1	3	4	1	1	10
BRAZIL	1	4	2	2	0	9
KUWAIT	0	2	1	3	1	7
AUSTRALIA	2	2	1	0	0	5
NIGERIA	4	0	0	0	0	4
GREECE	1	2	0	1	0	4
IRAQ	2	1	0	0	0	3
CANADA	2	0	0	0	1	3
MOROCCO	2	0	0	0	0	2
FRANCE	1	0	0	0	0	1
NEPAL	1	0	0	0	0	1
SINGAPORE	1	0	0	0	0	1
Total	**294 (28.46%)**	**251 (24.29%)**	**171 (16.55%)**	**123 (11.60%)**	**194 (18.78%)**	**1033**

11.1.1 Top Most Author Contribution (Country Wise): The analysis of contributions from authors pertaining to different geographical locations from top twenty countries it was revealed that the top most author contributions are from India with 3231 authors out of 4142 over the period of 5 years (2010-2014) followed by Iran, Turkey, China, and Pakistan with 221, 198, 113, and 85 authors respectively. The lowest numbers of authors are from Canada, Iraq, France, Nepal and Singapore with 9, 7, 5, 3 and 1 respectively. Year 2010 is most productive year in terms of author contributions with 1143 (27.59%) authors followed by year 2011 and 2014 with 1028 (24.81%) and 773 (18.66%) authors respectively. (Table 7).

Table 7. Top Most Author Contribution (Country Wise)

COUNTRY	2010	2011	2012	2013	2014	Total
INDIA	888	791	497	393	662	3231
IRAN	76	65	45	18	17	221
TURKEY	36	64	35	28	35	198
China	0	1	27	44	41	113
PAKISTAN	42	23	15	5	0	85
USA	3	31	3	16	6	59
MALAYSIA	20	6	15	6	0	47
KUWAIT	18	7	6	9	4	44
BRAZIL	3	19	8	8	0	38
SAUDI ARABIA	2	7	12	2	4	27
GREECE	6	6	0	4	0	16

AUSTRALIA	7	6	2	0	0	15
MOROCCO	12	0	0	0	0	12
NIGERIA	11	0	0	0	0	11
CANADA	5	0	0	0	4	9
IRAQ	5	2	0	0	0	7
FRANCE	5	0	0	0	0	5
NEPAL	3	0	0	0	0	3
SINGAPORE	1	0	0	0	0	1
Total	**1143 (27.59%)**	**1028 (24.81%)**	**665 (16.05%)**	**533 (12.86%)**	**773 (18.66%)**	**4142**

11.1.2 Year Wise Distribution of Publication Types: While analyzing the total number of publications in different categories from 2010-2014.Over the period of 5 years out of total 1103 publications, the leading contributions are in terms of articles i.e. 645 (58.47%), followed by letters 310 (28.10%)and editorials 97 (8.79%). The lowest publication types include Reviews, and Corrections with 47 (4.26%), and 4 (0.36%) respectively. The overall trend during different years is the same while in case of editorials and reviews the most productive year is 2011.While no corrections have been published in 2012 and 2013 (Table 8).

Table 8. Year Wise Distribution of Publication Types

PUBLICATIONS	**2010**	**2011**	**2012**	**2013**	**2014**	**TOTAL**
ARTICLES	172	143	115	90	125	645
LETTERS	104	71	48	34	53	310
EDITORIALS	15	40	14	14	14	97
REVIEWS	11	13	8	8	7	47
CORRECTIONS	1	1	0	0	2	4
TOTAL	**303 (27.47%)**	**268 (24.29%)**	**185 (16.77%)**	**146 (13.23%)**	**201 (18.22%)**	**1103**

11.1.3 Overall Distribution of Citations: Table 9 reveals overall citations received by different contribution types during 2010-2014 with articles being highly cited at 332 (70.04%) followed by letters 85 (17.93%), Editorials 34 (7.17%), Reviews 22 (4.64%) and lowest by corrections 1 (0.21%).The publication categories including letters, editorials, reviews, corrections numbering to 629 contributions have received no citations. It is evident from the data that most of the contributions received single citations 206 (43.45%) followed by more than three citations 88 (18.56%) with a clear lead in article category.

Table.9 Overall Distribution of Citations (2010-2014)

Publications	**Single**	**Double**	**Triple**	**More than Three**	**Total**	**Zero**
ARTICLES	115	75	61	81	332	313
LETTERS	60	16	6	3	85	225
EDITORIALS	19	11	4	0	34	63
REVIEWS	11	6	1	4	22	25
CORRECTIONS	1	0	0	0	1	3
TOTAL	**206**	**108**	**72**	**88**	**474**	**629**

12.0 Findings and Conclusion

In the field of medical sciences specialized research activities are being frequently carried out to address various issues concerning human health. With the advancements in technology Biomedical literature is multiplying with every passing day as more content is being made available through open as well as commercial modes. The growth in the quanta of literature in biomedicine can well be traced by analyzing the increasing number of literature and citations available through Medline, Pub med, Scopus, and Google Scholar etc. Journals form a major part of this body of literature especially the open access Journals. The present study therefore makes an attempt to carryout Bibliometric study of two select open access journals in the field of medical sciences.

A total of 2314 Publications were harvested pertaining to both Journal titles. Out of which 281 belonged to Bosnian Journal of Basic Medical Sciences and 1033 belonged to Indian Journal of Pathology and Microbiology. The data were analyzed and necessary findings and inferences were drawn based on the actual figures.

The above finding clearly reveal that good number of articles are being published in more specialized journals as is depicted by a greater number of articles amounting to 1033 being published in Indian Journal of Pathology and Microbiology. The trend is towards collaborative works with more number of authors preferring to work in collaboration. The increase in e-citations indicates the growth in the use of electronic resources over Printed resources. The study as such provides a clear picture of publication scenario in two open access journals in medical sciences from two distinct geographical domains and helps in understanding the researcher's choice, preferences and use of different resources for carrying out their research.

13.0 References

1. Basuki, S. (1984). A citation analysis of agricultural and medical journals published in less developed countries: With special reference to the region of Africa Sub-Sahara, Latin America and Southeast Asia.
2. Borgman, C. L. (1990). Scholarly communication and Bibliometrics. Newbury Park: Sage Publications.
3. Brace, W. (1975). A citation analysis of doctoral dissertations in library and information science, 1961-1970. Cleveland: Brace.
4. Braun, T., Bujdosó, E., & Schubert, A. (1987). Literature of analytical chemistry: A scientometric evaluation. Boca Raton, Fla: CRC Press.
5. Carson, J., FAST (Program), & Commission of the European Communities. (1981). Microbiology: A scientometric analysis. Brussels: Directorate-General for Science, Research and Development, Commission of the European Communities.
6. De, B. N. (2009). Bibliometrics and citation analysis: From the Science citation index to cybermetrics. Lanham, Md: Scarecrow Press.
7. Gipp, B. (2014). Citation-based plagiarism detection: Detecting disguised and cross-language plagiarism using citation pattern analysis.
8. Gupta, B. M. (1996). Bibliometrics, scientometrics and informetrics. Delhi: Segment Books.
9. Halpin, J. H. (1986). Citation analysis as the basis for journal collection management by academic libraries.
10. Harzing, A.-W. (2010). The Publish or perish book: Your guide to effective and responsible citation analysis. Melbourne: Tarma Software Research Pty Ltd.
11. Hertzel, D. H. (1985). Bibliographical approach to the history of idea development in bibliometrics.
12. Hjerppe, R. (1978). An outline of bibliometrics and citation analysis. Stockholm: Royal Institute of Technology Library.
13. Hjerppe, R. (1980). A bibliography of bibliometrics and citation indexing & analysis. Stockholm: Royal Institute of Technology Library.
14. Holden, G., Rosenberg, G., & Barker, K. (2005).Bibliometrics in social work. New York: Haworth Social Work Practice Press.
15. In Cronin, B., & In Sugimoto, C. R. (2014). Beyond bibliometrics: Harnessing multidimensional indicators of scholarly impact.
16. Informatics. (n.d.). Basel, Switzerland: MDPI AG.

17. Ingwersen, P. (2012). Scientometric indicators and webometrics -- and the polyrepresentation principle information retrieval. New Delhi: EssEss Publications. International benchmarks for academic library use of bibliometrics. (2014).
18. Jennings-Knotts, R. L., & Poling, A. D. (2007). Citation analysis and journal impact In school psychology: 1995-2004.
19. Karlsson, F. (1994).Linguistics in the light of citation analysis. Helsinki: University of Helsinki, Dept. of General Linguistics.
20. Mills, E. S. (1997). Evidence!: Citation & analysis for the family historian. Baltimore: Genealogical Pub. Co.
21. Moed, H. F. (2005). Citation analysis in research evaluation. (Springer e-books.) Dordrecht: Springer.
22. Munch-Petersen, E., &DanmarksBiblioteksskole. (1981). Bibliometrics and fiction. S.l.: Danmarks Biblioteksskole.
23. Narin, F. (1976). Evaluative bibliometrics: The use of publication and citation analysis in the evaluation of scientific activity. Cherry Hill, N.J: Computer Horizons
24. Nicholas, D., & Ritchie, M. (1978).Literature and bibliometrics. London: C. Bingley.
25. Oštrbenk, A., Škamperle, M., &Poljak, M. (January 01, 2012). Citation analysis of Acta Dermatovenerologica Alpina, Pannonicaet Adriatica: 1992-2011. Acta Dermatovenerologica Alpina, Panonnica Et Adriatica, 21, 3, 2012.
26. Potter, W. G. (1981). Bibliometrics. Champaign, Ill: University of Illinois Graduate School of Library and Information Science.
27. Sellen, M. K. (1993). Bibliometrics: An annotated bibliography, 1970-1990. New York: G.K. Hall.
28. Shapiro, F. R. (2001). Collected papers on legal citation analysis. Littleton, Colo: F.B. Rothman.
29. Small, H., & Institute for Scientific Information. (1990). Bibliometrics of basic research. Springfield, Va: National Technical Information Service.
30. Srivastava, R. (2010). Bibliometrics: New dimensions and latest trend. New Delhi: Alfa Publications.
31. Stringer, M. J. (2009).A complex systems approach to bibliometrics. (Dissertation Abstracts International, 70-12.)
32. Stuart, D. (2014). Web metrics for library and information professionals.
33. Suriya, M. (2011). Gender studies in informatics: An application of scientometric indicators and mapping techniques. New Delhi: EssEss Publications.
34. Vinkler, P. (2010). The evaluation of research by scientometric indicators. Oxford [England: Chandos Publishing.
35. Wrenn, T. T. (1989). Citation analysis and emerging technologies: Foundational technical developments in optical disk technology.