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Indian Journal of Pathology and Microbiology: A Scientometric Study

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Abstract *- The study is based on the Scientometric analysis of 607 research article published on the Indian journal of pathology and microbiology during the periods of 2010-2012. This Study will review on length of the title, numbers of pages, type of document, chronological distribution of article, no of references print as well as web references authorship pattern, author productivity and further it reveals Majorities 450 articles are published by India contributors followed by Iran as well as Pakistan and alternative contributors. The findings reveal various aspects of the characteristics and patterns of contributions of the study.*

Keywords: Scientometrics, pathology and microbiology

Introduction

Scientometrics is the science of measuring and analyzing science. In practice, Scientometrics is often done using Bibliometrics which is a measurement of the impact of (scientific) publications. Scientometrics is the science of method scientific output similar to Bibliometrics used by librarians and information scientist. (Agrawal, aruna, 1982); related fields are the history of science and technology philosophy of science and sociology of scientific knowledge. (Eugene Garfield, 1995) ; application of mathematical and statistical methods of scientific literature (Derek de solla, 2000) ; to identify national an international network and to map the development of new fields of science and technology as well as to know the inner logic of science development (yadavJaisi Ram, 1984) ; this enables to evaluate the size of scientific production on the assumption that the essence of scientific activity is the assumption the production of knowledge (Eugene Garfield, 2002); open access has emerged in the last few years as serious alternative to additional commercial publishing models taking the benefits offered by technology one step further (Wasudevan K T 1995); one significant finding in the field is principle of cost escalation to the effect that achieving further findings at a given level of importance grow exponentially more costly in the expenditure of efforts and resources

Definition Analysis

According to (2006), wouters, a cart intension has always existed between academic Scientometrics and political /practical, Scientometrics, the letter of which has been described as a hybrid of social science and bur rerate expertise (2006).

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 glorious years in the year 2007. Late Dr Vanmali Saran Maglik of King George Medical College, Lucknow is the founder editor who started the journal 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 under the able guidance of stalwarts like Late Dr HI Jhala, Late Dr V Ramalingaswamy, Dr HD Tandon, Late Dr BK Aikat and Late Dr S Nagalotimath. The present form is due to the untiring efforts of Dr KS Ratnakar, Dr VH Talib, Dr SK Shahi and Dr Harsh Mohan. 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.

Review of Literature

Scientometric / Bibliometric / Citation studies have done earlier by different authors on the different individual journal publications and literature on specific subject areas. The following studies related to the objectives of this study have been reviewed.

A Scientometric Analysis on Indian Journal of Physics was made by **Nattar S** which revealed that the year 2004 records the highest % of contributions regarding single, two and three authored. **Khaparde V.S (2011).** Bibliometric encompasses the measurements of properties of documents, &document related process. It uses mathematical & statistical methods to analysis & measure the output of scientific publications. **Khaparde V.S (2011)** Bibliometrics is an emerging trust area of research in the field of Library & Information science. Bibliometrics analysis is now considered as an active area of bibliometric research. **Khaparde V.S (2011).** Today information is the most vital resources for any kind of activity. The internet has an access to valuable resources scattered in various forms in different parts of the world. **Khaparde. S (2011).** Scientometrics is to provide quantitative characterization of scientific activity. Scientometric is branch of Library & Information Science. **Alhamdi, Khaparde & Kanekar, (2014)** They attempted on bibliometric analysis of ten volumes (57-66) in the field of journal of Documentation. It is based on the references appended to International Journal of "Journal of Documentation " during 2001 -2010. The present study is based on 15150 references appended to 364 articles contributed by the authors in Journal of Documentation. It was found that Journals

Citations are more in number than other citations. Also it was found that Solo Researchers are predominant than Collaborative Researchers. The extent of collaboration was not much popular among the Journal of Documentation. The mean relative growth for articles and citation in the first five years 2001 to 2005 is reduced according to the last five years 2006 to 2010. The value of group co-efficient (gp) was only 0.46. It was seen that researchers cited latest documents. Out of 364 articles there are 175 articles have pages length from 11 to 20.

Kannappanavar B U, Swamy C & Vijay Kumar M analyzed the publishing trends of Indian Chemical Scientists during 1996 – 2000, which revealed average number of authors per paper has increased from 7.52 to 8.39. An attempt was made by **Tilak Hazarika, Kusuma Goswami & Pritimoni Das** to analyze the contributions of Indian Forestor which found Degree of Collaboration was 0.64 among the authors. **Guan & Ma** examined the China's Semiconductor Literature and found mega authored papers records the higher value for Co-Authorship Index. **Senthamilselvi & Srinivasa Raghavan** analyzed the issues of IEEE Trans on Power Electronics published during 2006 – 2008 which revealed that maximum number of papers was published between 6 – 10 pages category. A bibliometric study has been carried out by **Kalyane V L and Sen B K** on the Journal of Oilseeds Research published during 1984 – 1992 which revealed that the keyword "Groundnut" tops the list with 53 records. **Sanni S A and Zainab A N** examined the contributions published in Medical Journal of Malaysia during 2004 – 2008 and found 4.82% (28) of contributions were published by Malaysian authors with foreign collaboration.

Objectives of the Study:

The primary objective of this study is to understand the growth of The Indian Journal of Pathology and Microbiology and their research output in global during the period 2010 - 2012. More specific objectives are as follows:

- To study the year-wise distribution of articles
- To study the frequency of citations
- To study the mail domain of publications
- To identify the length of page per article
- To find out organization wise distribution of publication.
- To find out country-wise distribution of articles.
- To find out the authorship pattern in the publication.
- To find out the reference of the article (Print as well as Web).

Scope and Limitation of the Study:

The present study is based on the Scientometric Profiles of The Indian Journal of Pathology and Microbiology. The present study is based on over all 607 articles during 2010-2012.

Data Collection:

Data can be numerically expressed that is quantified quantifiable or objective (Fasibs off and Dely, 1990) the data was collected from Indian Journal of Pathology and Microbiology, with the help of spss. total 607 articles, during 2010-2012.

Data Analysis and Interpretation:

Scientometrics analysis is a branch of bibliometrics. It is an important research tools for understanding of the subject it aims at measuring the utility of documents and relationship between documents and fields.
The present study is based on the Scientometric Profiles of Indian Journal of Pathology and Microbiology. The present study is based on over all 607 articles during 2010-2012.

Year-Wise Distribution of Contributions

Table No. 1: Year-Wise Distribution of Contributions

Year	Frequency	Percent
2010	327	53.87
2011	96	15.82
2012	184	30.31
Total	**607**	**100.00**

It can be observed from the table No. 1 & Figure no. 1 out of the total 607 contributions majority of the contributions i.e. 327 contributions were contributed in 2010 were as minimum contributions i.e. 96 contributions were contributed in 2011. In which hypothesis no.01 is valid. “Majority of the contributions are contributed in 2010” Table no, 01.

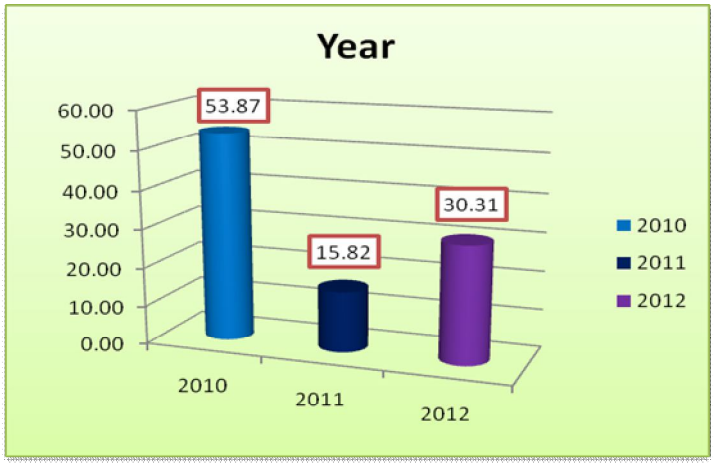

Figure No. 1 Distribution of contributions (year-wise)

Authorship pattern of contribution

The Authorship pattern of contributions is shown in Table No.2

Table No.2: Authorship pattern of contributions

Sr. No.	Type Of Author	Frequency	Percentage
1	Four	173	28.5
2	Three	165	27.18
3	Five	86	14.17
4	Two	60	9.88
5	Six	53	8.73
6	Single	34	5.6
7	More Than Six	36	5.93
Total		**607**	**100**

The distribution of Authorship pattern is given in the Table No.2. The table shows the multiple authorship is predominant then single authors. Table No. 2 &Figure no. 2 indicates the majority of the contributions are contributed by **four** authors. In which hypothesis no.02 is valid. "Majority of the contributions are contributed by four authors" Table no, 2.

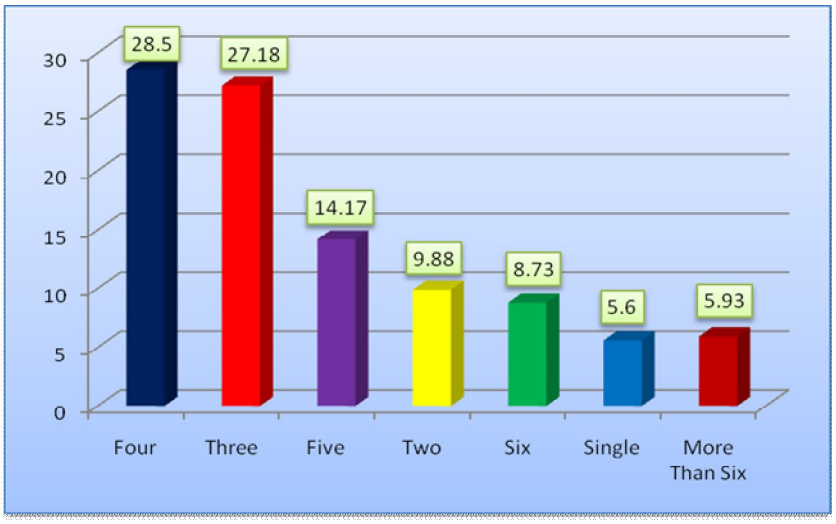

Figure No. 2 Authorship pattern of contributions

Table no. 3 Author wise distribution of article

Sr. No.	Name of Author	Frequency	Percentage
1	Bharat Rekhi	5	0.82
2	Ibrahim Gelincik	5	0.82
3	Pradeep Vaideeswar	5	0.82
4	Anjali Sharma	4	0.66
5	Kusum D. Jashnani	4	0.66
6	Anuj Khurana	3	0.49
7	Asim Qureshi	3	0.49

8	Baijayantimala Mishra	3	0.49
9	Bita Geramizadeh	3	0.49
10	Chandralekha Tampi	3	0.49
11	Kavita Mardi	3	0.49
12	Mohanad M. Ahmed	3	0.49
13	Mudassar Hussain	3	0.49
14	Neha Singh	3	0.49
15	Ranjana W. Minz	3	0.49
16	Shirley Sundersingh	3	0.49
17	Sunitha Jacob	3	0.49
18	Veena Kashyap	3	0.49
19	Akbar Safai	3	0.49
20	two time publication 2x70	140	-
21	One Time Author 1x402	402	-
	Total	**607**	-

It can be observed from the table no 03 and figure there were three authors they had 5 publication names of these three authors Bharat Rekhi, Ibrahim Gelincik and Pradeep Vaideeswar.then 2 author published 4 articles and 42 author published 3 articles 2 time publication were 70 authors and 402 author had only one publication.

Table No. 4. Institution wise distribution of Article

Sr. No.	Name of Institution	Frequency	Percentage
1	Department Of Pathology	54	8.90
2	Department Of Microbiology	7	1.15
3	Department Of Pathology, JSS Medical College, Mysore Karnataka, India	4	0.66
4	Department Of Pathology, Army College Of Medical Sciences, Delhi Cant	4	0.66
5	Department Of Pathology, Christian Medical College & Hospital, Ludhiana	4	0.66
6	Department Of Histopathology	3	0.49
7	Departments Of Pathology, 1Anatomy, India Gandhi Medical College, Sheila, India	3	0.49
8	Departments Of Pathology, 1Biostatistics And 2Surgery, Unit VI, Christian Medical College,	3	0.49
9	Departments Of Pathology, 1Medicine, Kasturba Medical College, Mangalore, India	2	0.33
10	Departments Of Pathology, 1Neurosurgery, Sanjay Gandhi Post Graduate Institute Of Medical Sciences, Lucknow, UP	2	0.33
11	Departments Of Pathology, 1Radiology And Gynaecology And 2Obstetrics, All India Institute Of	2	0.33

	Medical Sciences, New Delhi, India		
12	Departments Of Pathology, 1Radiotherapy And 2Neurosurgery, All India Institute Of Medical Sciences, New Delhi	2	0.33
13	Departments Of Plastic And Reconstructive Surgery	2	0.33
14	Departments Of Transfusion Medicine And 1Pediatrics, PGIMER, Chandigarh, Punjab	2	0.33
15	School Of Dentistry, Paulista University, Goiânia/GO-Brazil	2	0.33
16	SRL Ranbaxy Pvt Ltd	2	0.33
17	Departments Of Virology	2	0.33
18	Division Of Cytopathology, Institute Of Cytology And Preventive	2	0.33
19	Faculty Of Medicine, AIMST University	2	0.33
20	From The Divisions Of Hematology And 1Hematopathology, Vancouver General Hospital, Vancouver, BC	2	0.33
21	G. Gennimatas Hospital, 2nd Surgical Clinic, Aristotle University Of Thessaloniki, 1G. Gennimatas Hospital, Department Of Pathology, Ethnikis Aminis	2	0.33
22	JSS Medical College, Mysore, Karnataka-570 011, India	2	0.33
23	LTM General Hospital & Municipal Medical College, India	2	0.33
24	Ataturk Research And Training Hospital, Pathology, 2Ataturk Research And Training Hospital, Radiology, Turkey	2	0.33
25	Department Of Forensic Medicine, Faculty Of Medicine, University Of Peradeniya	2	0.33
26	Department Of Hematology	2	0.33
27	Department Of Medical Microbiology	2	0.33
28	Department Of Pathology & Microbiology, The Aga Khan University, Karachi, Pakistan	2	0.33
29	Department Of Pathology And Laboratory Medicine, The University Of Texas Medical School At Houston, USA	2	0.33
30	Department Of Pathology, Al-Jahra Hospital	2	0.33
31	Department Of Pathology, All India Institute Of Medical Sciences, Ansari Nagar, New Delhi-110 029, India	2	0.33
32	Department Of Pathology, Armed Forces Medical College, Pune	2	0.33
33	Department Of Pathology, BYL Nair Hospital & TN Medical College, Mumbai- 400 008, India	2	0.33
34	Department Of Pathology, Cancer Institute (W.I.A.), 38, Sardar Patel Road, Chennai-600 036, India	2	0.33

35	Department Of Pathology, CIO Laboratory, 1V.M.M.C And Safdarjung Hospital, New Delhi, India	2	0.33
36	Department Of Pathology, Faculty Of Medicine, Kuwait University	2	0.33
37	Department Of Pathology, G B Pant Hospital, New Delhi	2	0.33
38	Department Of Pathology, Institute Of Post Graduate Medical Education And Research, 244A AJC Bose Road, Kolkata	2	0.33
39	Department Of Pathology, Lady Hardinge Medical College And Smt. Sucheta Kriplani Hospital, New Delhi, India	2	0.33
40	Department Of Pathology, Maulana Azad Medical College	2	0.33
41	Department Of Pathology, Maulana Azad Medical College And Lok Nayak Hospital, Bahadur Shah Zafar Marg, New Delhi	2	0.33
42	Department Of Pathology, Maulana Azad Medical College, New Delhi, India	2	0.33
43	Department Of Pathology, Moti Lal Nehru Medical College, Allahabad	2	0.33
44	Department Of Pathology, MVJ Medical College & Research Hospital	2	0.33
45	Department Of Pathology, Region Education And Research Hospital,	2	0.33
46	Department Of Pathology, Region Education Research Hospital, Erzurum,	2	0.33
47	Department Of Pathology, Sanjay Gandhi Postgraduate Institute Of Medical Sciences, Lucknow, Uttar Pradesh	2	0.33
48	Department Of Pathology, Tata Memorial Hospital, Mumbai	2	0.33
49	Department Of Pathology, Tata Memorial Hospital, Parel, Mumbai	2	0.33
50	Department Of Pathology, University College Of Medical Sciences And GTB Hospital, Delhi	2	0.33
51	Department Of Pathology, V.M.M.C And Safdarjung Hospital, New Delhi	2	0.33
52	Department Of Pathology, Vijaya Diagnostics Pvt Ltd, Hyderabad	2	0.33
53	Departments Of Immunopathology	2	0.33
54	Departments Of Microbiology, 1,3Ophthalmology, Assam Medical College, Dibrugarh, 2Chandraprava Eye Hospital, Jorhat, Assam	2	0.33
55	Departments Of Pathology And 1Forensic Medicine,	2	0.33

	Maulana Azad		
56	Departments Of Pathology And 1Hemato Oncology, Sri Ramachandra University, Porur, Chennai	2	0.33
57	Departments Of Pathology And 1Paediatric Surgery, Pt. B.D. Sharma PGIMS, Rohtak, Haryana-	2	0.33
58	One Time Publication Of Institute 1x427	427	70.35
Total		**607**	100.00

The distribution of published papers by institution wise the table 3 reveals that, out of 607 contributors, the highest number 54(8.90%) Department Of Pathology. Department Of Microbiology the second place with 7(1.15%) contributors. the 3 institute are contributed 4 publication on third place. There three institutes were stands the fourth place with 3 contributors. the 49 institution stands on fifth place with two publication, the 427 institution stands on six place with one publication.

Table No. 5. Country wise distribution of the article

Sr. No.	Name Of Country	Frequency	Percent
1	India	450	74.14
2	Iran	26	4.28
3	Pakistan	26	4.28
4	Turkey	25	4.12
5	Malaysia	15	2.47
6	USA	7	1.15
7	Saudi Arabia	6	0.99
8	France	6	0.99
9	Kuwait	6	0.99
10	Brazil	5	0.82
11	UK	5	0.82
12	Australia	3	0.49
13	Canada	3	0.49
14	Greece	3	0.49
15	Egypt	2	0.33
16	Sri Lanka	2	0.33
17	Spain	2	0.33
18	Italy	2	0.33
19	Oman	2	0.33
20	Denmark	1	0.16
21	France	1	0.16
22	Bulgaria.	1	0.16
23	Iraq	1	0.16
24	Japan	1	0.16
25	Mexico	1	0.16

26	Nepal	1	0.16
27	Taiwan	1	0.16
28	Teheran	1	0.16
29	UAE.	1	0.16
30	West Indies	1	0.16
Total		**607**	**100**

It can be observed from Table No. 4 the country wise distribution of contributors, the table 4 reveals that out of the total 607 contributors has contributed during 2010-2012, majority of article 450(74.14%) have been contributed form India country.26(4.28%) contributors have been contributed form Iran as well as Pakisthan,25 contributors have been contributed from Turky, 15 contributors have been contributed from Malishiya, 7 contributors have been contributed from USA, 3 country contributors have been contributed six publication from Saudi Arabia, France and Kuwait. 2 country contributed with 5 publication, 3 country contributed with 3 publication is India, 5 country contributed with 2 publication, and 11 country contributed with one publication. In which hypothesis no.04 is valid. “Majority of the contributions are contributed by USA” Table no, 04.

Table No. 06. Email domain wise distribution of the article

Mail Domain			
Sr. No	**mail domain name**	**Frequency**	**Percent**
1	yahoo	194	31.96
2	gmail	121	19.93
3	hotmail	59	9.72
4	rediffmai	43	7.08
5	not mentioned	28	4.61
6	cmcvellore	7	1.15
7	aku	7	1.15
8	sgpgi	7	1.15
9	sums	6	0.99
10	apollohospitals	3	0.49
11	kb	3	0.49
12	sify	3	0.49
13	med.monash	2	0.33
14	mjain	2	0.33
15	mynet	2	0.33
16	paaricmc	2	0.33
17	r_kumar2004	2	0.33
18	reema_44	2	0.33
19	sangukin	2	0.33
20	satishsuchitha	2	0.33
21	ruchika257	2	0.33
22	sbmu	2	0.33
23	shahed	2	0.33

24	shirleysundersingh	2	0.33
25	sina.tums	2	0.33
26	sunita	2	0.33
27	tums	2	0.33
28	vch	2	0.33
29	vijayab_jai	2	0.33
30	demetetit	2	0.33
31	ddragoumis	2	0.33
32	drjthanka	2	0.33
33	jayahar	2	0.33
34	kavitamardi	2	0.33
35	khanna	2	0.33
36	ksu	2	0.33
37	163	2	0.33
38	bushra.moiz	2	0.33
39	chaturvedi	2	0.33
40	claudiomaranhao	2	0.33
41	one time publication 1x 70	70	0.16
Total		**607**	**100**

It can be observed from Table no. 5 there were as many as 194(31.96%) authors used the yahoo.121 (19.93%) authors used the gmail email domain. 59(9.72%) authors used the hotmail email domain and 49 authors used the rediffmail email domain like that five four three and two publication of the mail domain given there.28 author not mentioned theie emain domain name in their paper.70 authors email domain with one publication of the mail domain.

Table no.07. Domain name wise distribution of the articles

Sr. No.	Email domain Name	Frequency	Percent
1	.com	449	73.97
2	.co.in	40	6.59
3	not mentioned	28	4.61
4	.ac.in	18	2.97
5	.edu	18	2.97
6	.ac.ir	12	1.98
7	.co.uk	7	1.15
8	.edu.my	4	0.66
9	.edu.sa	3	0.49
10	.net.in	3	0.49
11	.aravind.org	2	0.33
12	.ca	2	0.33
13	.me	2	0.33
14	.net	2	0.33

15	.org	2	0.33
16	.ruchika257	2	0.33
17	.tn.it	2	0.33
18	.ac.ae	1	0.16
19	.ac.jp	1	0.16
20	.aku.edu	1	0.16
21	.bg	1	0.16
22	.com.cn	1	0.16
23	.in	1	0.16
24	.my	1	0.16
25	.om	1	0.16
26	.tr	1	0.16
27	.uk	1	0.16
28	.usm.my	1	0.16
	Total	**607**	**100.00**

It can be observed from Table no. 6. There were as many as 449 authors used the com. Domain name, and 28 authors has not mention their domain name in the papers, 40 authors used the co.in. Domain name, 18 authors use the ac.in and edu Domain name, 12 authors used the ac.ir domain name, 7 authors used the co.uk.domain name. Followed by four, and three and two authors contribution also shows. And 12 authors used the domain name with one publication.

Table no.08. Type of document wise distribution of article

Sr. No.	Type of Document	Frequency	Percent
1	Original Article	210	34.60
2	Letters to Editor	149	24.55
3	Case Report	172	28.34
4	Images	50	8.24
5	Review Article	15	2.47
6	Brief Communication	7	1.15
7	Guest Editorial	2	0.33
8	Acknowledgement	1	0.16
9	Editorial	1	0.16
	Total	**607**	**100.00**

It can be observed from Table no. 7 the highest 210(34.60%) number of publication has been published in Original Article in these study. then 149 publication under the document type of letter to editor. followed by case report is also many contribution number is 172(28.34%) and 50(8.24%) Publication has image document type. 15(2.47%) publication has review document type. under the document type brief communication 7 papers. in this study included 2 guest editorial and one editorial and one Acknowledgement.

Table no.09 No. of References wise distribution of article

No of references			
Year	**Total References**	**Print References**	**Web References**
2010	3880	3878	2
2011	1341	1341	0
2012	2402	2892	10

It can be observed from the table no 08 and figure also maxim articles are from print references the majority print references in the year of 2010 were 3878.amd then the minimum references are from web references total 12 web references in the duration of 2010 to 2012 and majority web references in the year of 2012 is total 10 web references are given there.

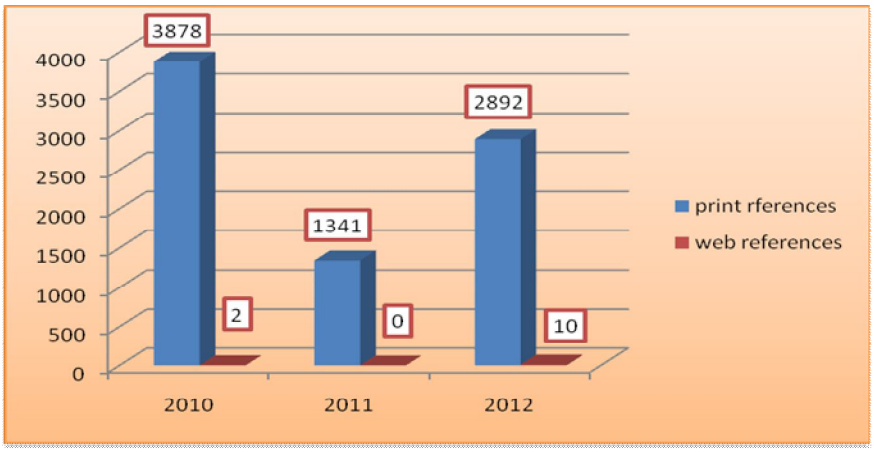

Figure no.07 No. of References wise distribution of article

Table no.10 Length of pages wise distribution of article

Length of pages		
no of pages	**Frequency**	**Percent**
1	17	2.80
2	189	31.14
3	166	27.35
4	83	13.67
5	85	14.00
6	40	6.59
7	17	2.80
8	6	0.99
9	1	0.16
10	1	0.16
11	2	0.33
Total	**607**	**100**

It can be observed from the table no 10 and figure no 08 the majority articles length of pages 189 articles publication from 02 pages. Then 166 articles were published from3 pages.85 papers were from 5 pages followed by 83 papers from 4 pages like that 40 papers from 6 pages.17 paper were from 7 and 01 pages.6 paper from 8 pages. only one paper are from 10 pages and again one was from 09 pages. And followed by two paper from 11 pages. like that all detail were show this table.

Findings:

- The highest numbers 327 (53.87%) of papers were published in 2010 contributing.
- More than two-thirds 40 (71.4%) of papers were contributed by multiple authors.
- India is the top producing Country with 450 publications of the total output
- The majority 189 of publications have citations from 02 pages.
- Majority references are from print references.
- Majority of web references are available in year 2012.
- The highest number of publication has published in Original Article 210.

Conclusion:

Scientometric is a relatively new subject of information. It helps to evaluate information & to handle the information in libraries and information centers by the quantitative analyzed information. It deals with the mathematical and statistical analysis. This is an umbrella term used for many studies where quantitative method or techniques are used to investigate various aspect of written document.

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