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Psychooncology: Journal of the psychological, social and behavioral dimensions of cancer: a scientometric study

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Abstract

This article has made an attempt to evaluate the papers published in psychooncology - journal of the psychological, SOCIAL and behavioral dimensions of cancer (psycho – oncology) in the period 2005 to 2015. Totally, 7840 research documents in the form of Plain Text file format were downloaded from Web of Science database by Thomson Reuters before and known as Web of Knowledge. Making use of various scientometric indicators like the Year wise distribution of documents, relative growth rate, research document type, authorship pattern, Degree of collaboration, country wise Distribution, Institution wise distribution was also used to analyze the data and interpretation.

Keywords: Authorship Pattern, Bibliometrics Analysis, Cancer, Publication Analysis, Scientometric analysis.

Introduction

Psycho - Oncology has been considered as a source journal for this study. Psycho - Oncology as a quarterly publication in 1992 to 1997, its popularity has led to a doubling in size and a move to bimonthly publication in 1998 to 2003 and finally converted into a monthly publication in 2004 onwards. The first issue of volume 1 and number 1 was published in April 1992 on behalf of John Wiley & Sons and Psycho-Oncology has been available exclusively online since January 2013. Scientometrics analysis has been utilized by many research scholars to investigate conceptual network in different discipline in the most recent couple of decades. For this study, we have picked a couple of them and showed here.

Senthilkumar R. and Muthukrishnan M.[1] present bibliometric analyses of 10681 articles published in the annals of oncology (AOO) during 2010-2014. Prabir Kumar Das[2] study aim to explain the scientometrics method like the authorship pattern and research collaboration in the major field of Informetrics based on 420 documents published in the Journal of Informetrics during 2007 to 2013. Iqbalahmad U. Rajgoli, Ashalatha Laxminarsaiah[3] study highlights the 4,355 researchers have published 1,907 research papers. The Journal of Spacecraft and Rockets has published the 1,487 number of research papers throughout the study period. Ramakrishnan and Thavamani[4] analysis the authorship pattern in the major research topic of Hepatitis C and the data downloaded from the Journal "Gastroenterology". Thavamani[5] presents a bibliometric study of Collaborative Librarianship throughout the period of 2009-2014. Navaneetha krishnan[6] focus research analysis is to find the authorship patterns and the degree of collaboration of Sri Lanka in humanities and social science research during the period of 1960–2012. Thavamani[7] aim to present a bibliometric study of Malaysian Journal of Library and Information Science. Velmurugan[8] has been analyzed with 546 research papers published in the Indian Journal of Pure and Applied Physics (IJPAP) during the period of 2009-2012. Bales et al.[9] study highlight for exploring co-authorship patterns and author collaboration with high-impact journals. Chanda Arya[10] study aims to analysis the scientometrics methods in the subject area of veterinary sciences for worldwide level and extraordinary reference to India during the period of 2006-2010. Pallab Pradhan, Saroj Panda[11] study focus of analysis the authorship pattern and author's collaborative research in Indian chemistry research articles and during the period of 2000-2009. Zafrunnisha and Pullareddy[12] study aim to analysis the 141 Ph. D theses submitted to three universities during the study period of 1963 – 2003.

Objectives: Scientometric methods were used to analysis the research publications published in the Psycho Oncology during the selected eleven years between 2005 and 2015. The foremost objectives of bibliometric study are to identify and carry out the following factors: i. To analysis the annual distribution of research publications during the selected period, ii. To study the growth of literature and doubling time of the publications. iii. To examine the authorship pattern of the publications. iv. To find out the author productivity of the journal. v. To determine the Degree of collaboration (DC), and time series analysis of the journal.

Methodology

All required data set were downloaded from the "Thomson Reuters - Web of Science" database (WoS) beforehand known as Web of Knowledge and the search was completed on 02 January 2017 to download all the publications. The literature

search was conducted via "Publication Name" search (SO) the term "Psycho-Oncology" selected in the search field and the time span 2005-2015 was used as a restriction for the publication data. Finally, 7840 publications were selected as the samples and these publications organized the database for further analysis.

The downloaded records were analyzed using the scientometric technique for analysis various factors like annual distribution of publications, the relative growth rate of research documents, doubling time of research documents, Authorship Pattern of the research documents, the degree of the collaboration of the research documents and Time Series Analysis of the research documents etc.

Results and discussion

Table-1: Annual Distribution of Publications.

S No	Year	VN	TR	%
1	2005	14	313	4.00
2	**2006**	**15**	**1330**	**17.00**
3	2007	16	875	11.20
4	2008	17	997	12.70
5	2009	18	213	2.70
6	**2010**	**19**	**169**	**2.20**
7	2011	20	178	2.30
8	2012	21	449	5.70
9	2013	22	1258	160
10	2014	23	1129	14.40
11	2015	24	929	11.80

*VN=Volume Number, *TR=Total Records.

Analysis of the data indicates that the annual research output in Psycho Oncology maintains two to seventeen percentage of the total output during 2005-2015 are given in Table-1 and Figure-1, usually the number of research article publication was 713 per year. According to the results observed, it could be said that the numbers of research documents published from 2005 to 2015 are considerably not close to each other. It has been observed that the year 2006 has the most noted number of research documents published (17.0%) followed by 2014 (14.40%), 2008 (12.70%) and 2015 (11.80%) respectively. The year of 2010 has the lowest publication among the 11 years with 2.20%.

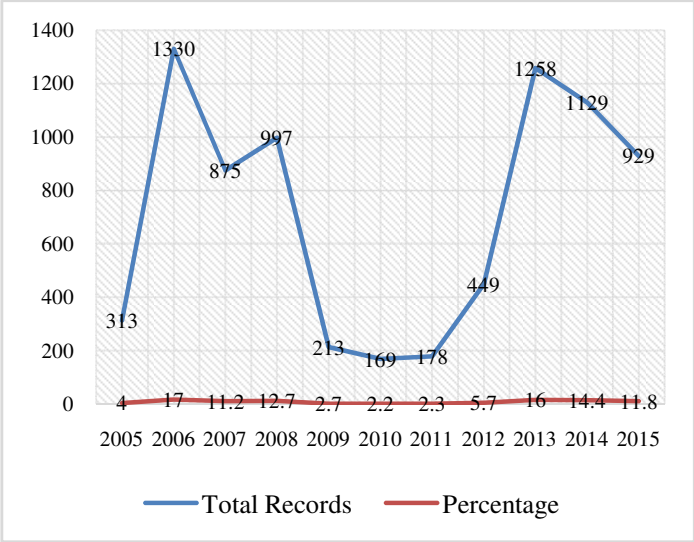

Figure-1: Annual Distribution of Publications.

Relative growth rate (RGR): The Relative Growth Rate (RGR) is one of the greatest understandable features of science in recent years. The RGR for each research article and pages can be calculated independently.

$$R(a) = \frac{(W2 - W1)}{(T2 - T1)}$$

Whereas: R (a) = RGR over the particular time of period, W1= logW1 (log Value of opening number of research papers/pages), W2= logW2 (log Value of the final number of research papers/pages), T2- T1 = Unit difference between the opening and end time.

Doubling time (DT): There is an immediate similarity between the relative growth rate and doubling time and the corresponding doubling time was calculated by the following formula,

$$Doubling\ Time\ (DT) = \frac{(0.693)}{(RGR)}$$

Table-2 and Figure-2 represent RGR and DT for publications for the period 2005-2015, that its relative growth rates has decreased from 2006 (1.66) to 2015 (0.12) in the 11 year period. The Doubling time improved from 0.42 to5.77 and during the period 2006-2015 and the doubling time is highest in the year 2010 with 17.33. It is clearly observed that the relative growth rate and the doubling time are inversely associated and another observation that year 2006 and year 2013 there is an aggressive growth in research output. Then again, the DT has been increasing during the period 2009 - 2011 and brings down the value 0.42 during the period 2005-2006.

Table-2: RGR and DT of publications.

S No.	Year	Total Records	%	Cumulative	W1	W2	RGR	DT
1	2005	313	4	313	…	5.74	…	…
2	2006	1330	17	1643	5.74	7.40	1.66	0.42
3	2007	875	11.2	2518	7.40	7.83	0.43	1.61
4	2008	997	12.7	3515	7.83	8.16	0.33	2.10
5	2009	213	2.7	3728	8.16	8.22	0.06	11.55
6	2010	169	2.2	3897	8.22	8.26	0.04	17.33
7	2011	178	2.3	4075	8.26	8.31	0.05	13.86
8	2012	449	5.7	4524	8.31	8.41	0.10	6.93
9	2013	1258	16	5782	8.41	8.66	0.25	2.77
10	2014	1129	14.4	6911	8.66	8.84	0.18	3.85
11	2015	929	11.8	7840	8.84	8.96	0.12	5.77
	Total	7840	100	44746				

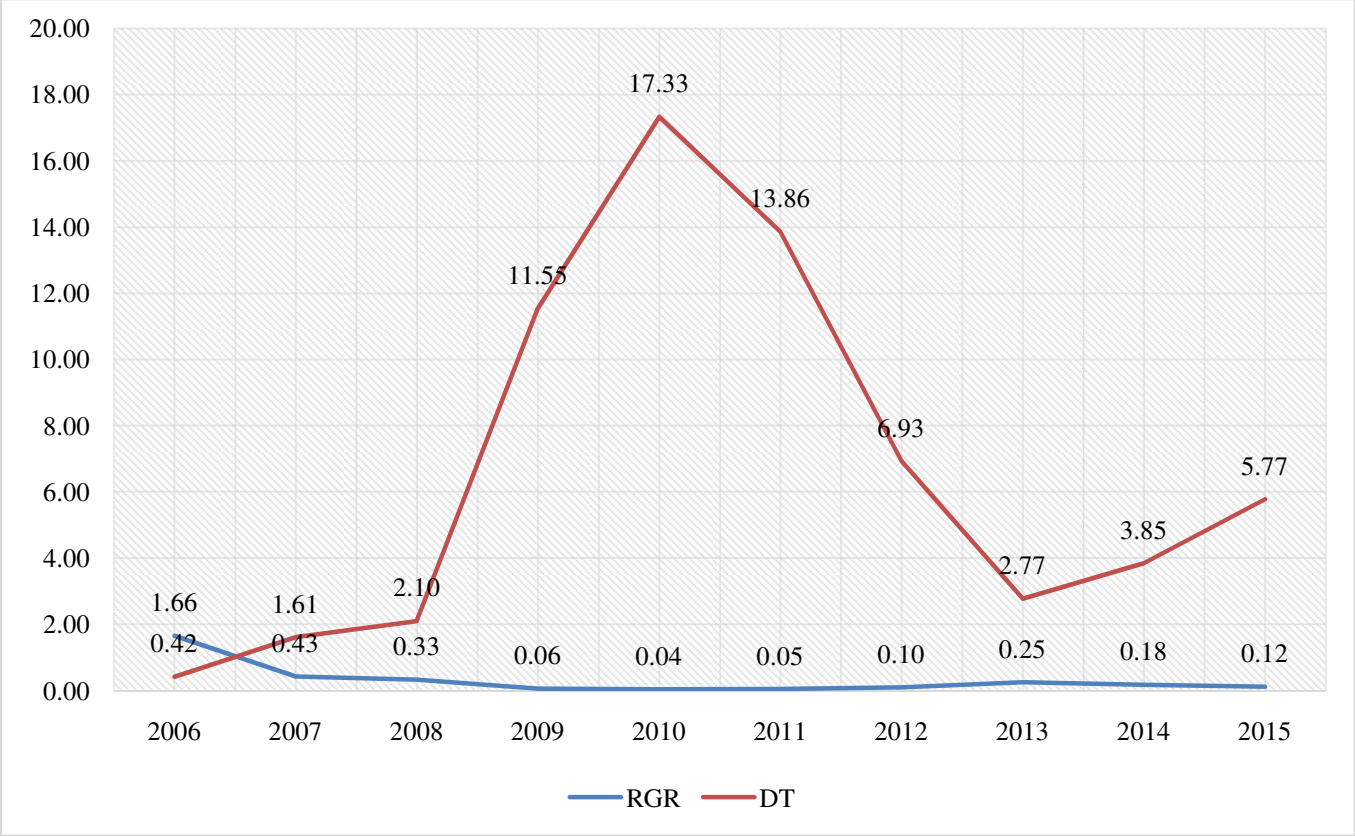

Figure-2: Relative growth rate (RGR) and Doubling Time (DT) of publications.

Presenting the authorship pattern (AP) of the journal: Table-3 shows that the particulars about the authorship pattern of research publications published throughout the period of study. A total of 34,524 contributors have published the 7,840 articles and the average number of authors per article found to be 4.40. Out of a total of 7,840 research publications, 1010 (12.88%) articles are contributed by a single author and 6,830 (77.12%) research articles are contributed by multiple authors. It could be identified that the Four authored articles involved highest percentage 1327 (16.93%), Five authored articles 1312 (16.73%) after three authored articles 1191 (15.19%) of the aggregate 7840 articles and six to thirteen authored contributions are between 12 to 1 percent. The above thirteen authored contributions are below one percent of the articles. In this way, indicating unmistakably the increased pattern towards multiple authorship is dominant as compared to single authorship.

Table-3: Presenting the Authorship pattern (AP) of the Journal.

S No	Number of Authors	Records	%	AP	%
1	Single	1010	12.88	1010	2.93
2	Two	967	12.33	1934	5.60
3	Three	1191	15.19	3573	10.35
4	**Four**	**1327**	**16.93**	5308	15.37
5	Five	1312	16.73	6560	19.00
6	Six	701	8.94	4206	12.18
7	Seven	441	5.63	3087	8.94
8	Eight	292	3.72	2336	6.77
9	Nine	196	2.50	1764	5.11
10	Ten	174	2.22	1740	5.04
11	Eleven	74	0.94	814	2.36
12	Twelve	46	0.59	552	1.60
13	Thirteen	37	0.47	481	1.39
14	Fourteen	18	0.23	252	0.73
15	Fifteen	21	0.27	315	0.91
16	Sixteen	12	0.15	192	0.56
17	Seventeen	6	0.08	102	0.30
18	Eighteen	5	0.06	90	0.26
19	Nineteen	2	0.03	38	0.11
20	Twenty	6	0.08	120	0.35
21	Twenty+	2	0.03	50	0.14
	Total	7840	100	34524	100

*AP = Authorship pattern,

Degree of author's collaboration: Table-4 represent the degree of collaboration of psycho oncology - journal of the psychological, social and behavioral dimensions of cancer during the period of study between 2005 and 2015. It was calculated utilizing by the equation given by K

The formula is $C = \frac{Nm}{Nm+Ns}$

Whereas: C = Degree of collaboration, Nm = Number of multi contributors research papers in the discipline, Ns = Number of single contributors papers in the discipline,

Here, Nm = 6830, Ns = 1010,

$$C = \frac{6830}{6830 + 1010} = 0.87,$$

$So,$ the degree of collaboration of the journal is 0.87

Table-4 shows that the degree of collaboration during the period of study between 2005 and 2015 is 0.87. The single authored articles are covered only 1010 (12.88%) during the years. The multi authored articles 6830 (87.12%) are maximum throughout the years. Which clearly shows its strength upon multi authored collaborative research. In any case, when we calculate the year-wise degree of collaboration for a study period, the results arise differently and the mean value is 0.87.

According to year wise analysis Table-5 speaks about multi-authored contribution and their degree of collaboration. In this analysis, the degree of collaboration was not a constant value; it reveals the variation of 0.02 to 0.14 and the mean value as 0.87. The analysis found that a single author papers and multi-authored papers are very low during the period of 2009 – 2011. It has been observed that the multi-authorship pattern is not considerably stable.

Time series analysis: The time series analysis under study here is 2005-2015 and the prediction of literature output by psycho-oncology - journal of the psychological, social and behavioral dimensions of cancer in the year 2020 was calculated.

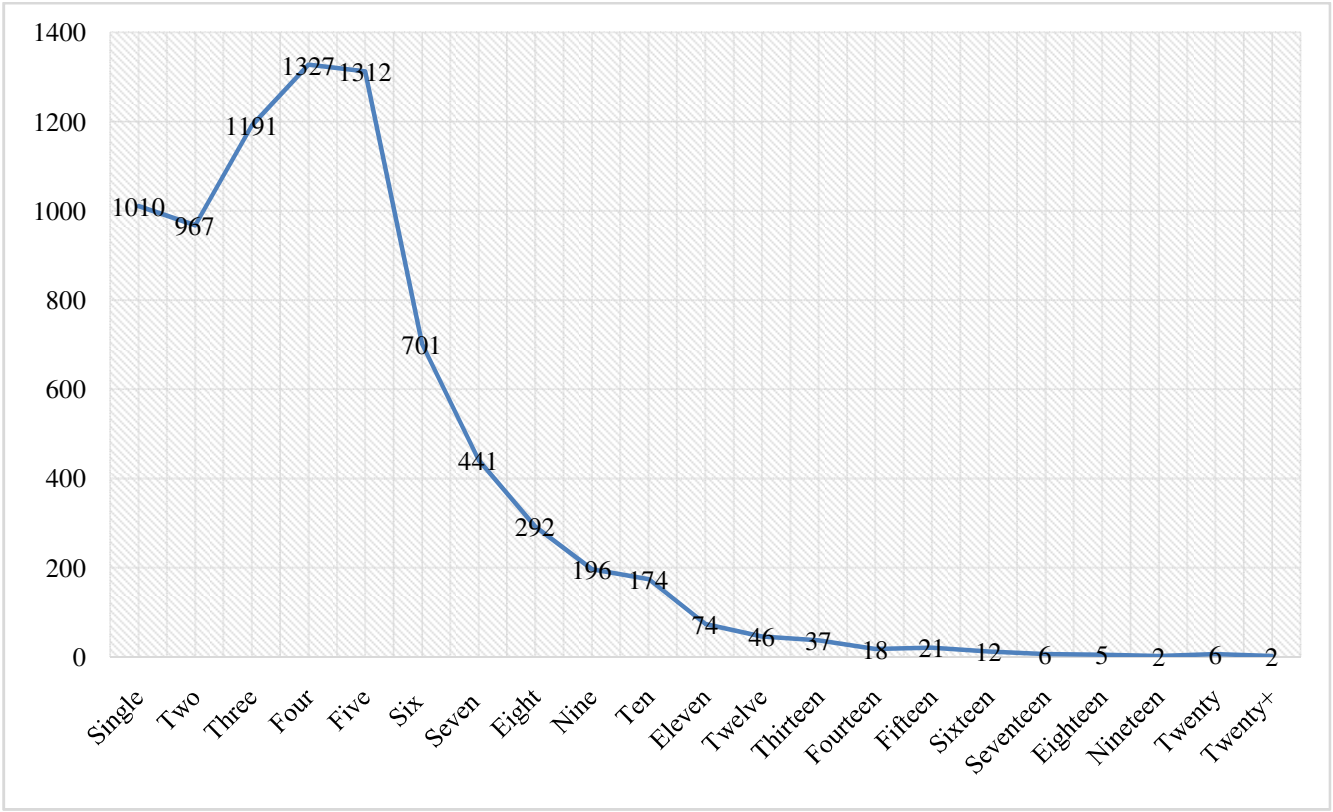

Figure-3: Presenting the Authorship pattern of the Journal.

Table-4: Presenting the degree of collaboration of the Journal.

S No	Year	Single Author	%	Multi Authors	%	DC
1	2005-2015	1010	12.88	6830	87.12	0.87

Table-5: Presenting the year wise Degree of Collaboration of the journal.

S No	Year	SAP	%	MAP	%	Total	%	DC
1	2005	44	4.36	269	3.94	313	4.00	0.03
2	2006	208	20.59	1122	16.43	1330	17.00	0.14
3	2007	137	13.56	738	10.81	875	11.20	0.09
4	2008	160	15.84	837	12.25	997	12.70	0.11
5	2009	19	1.88	194	2.84	213	2.70	0.02
6	2010	16	1.58	153	2.24	169	2.20	0.02
7	2011	17	1.68	161	2.36	178	2.30	0.02
8	2012	41	4.06	408	5.97	449	5.70	0.05
9	2013	122	12.08	1136	16.63	1258	16.00	0.14
10	2014	124	12.28	1005	14.71	1129	14.40	0.13
11	2015	122	12.08	807	11.82	929	11.80	0.10
	Total	1010	100.00	6830	100.00	7840	100.00	0.87

*SAP = Single Authored Paper, *MAP = Multi Authored Papers, *DC = Degree of Collaboration.

Table-6: Presenting the Time Series Analysis of the journal.

S. No	Year	SAP (Y)	X	X^2	XY	MAP (Y)	XY	CP (Y)	XY
1	2005	44	-5	25	-220	269	-1345	313	-1565
2	2006	208	-4	16	-832	1122	-4488	1330	-5320
3	2007	137	-3	9	-411	738	-2214	875	-2625
4	2008	160	-2	4	-320	837	-1674	997	-1994
5	2009	19	-1	1	-19	194	-194	213	-213
6	**2010**	16	0	0	0	153	0	169	0
7	2011	17	1	1	17	161	161	178	178
8	2012	41	2	4	82	408	816	449	898
9	2013	122	3	9	366	1136	3408	1258	3774
10	2014	124	4	16	496	1005	4020	1129	4516
11	2015	122	5	25	610	807	4035	929	4645
	Total	1010	0	110	-231	6830	2525	7840	2294

*SAP = Single Authored Paper, *MAP = Multi Authored Papers, *CP = Collaborative Papers.

Single authored publications: time series analysis: The straight line formula is used to reach at projections for future growth under Time Series analysis. Straight line formula Yc = a+b X since Σx = 0, a=ΣY/N, ΣY = (Total Number of research documents by Single Author), N = (Number of Years), a = 1010/11, a = 91.81, b=ΣXY/Σ, ΣXY = (Total of XY Tables), Σ = (Total of X2 Table), b= -231/110, b= -2.1.

Estimated literature in 2020 is, When X = 2020-2010 (Mid-Year), X = 10, Apply straight line formula, Yc = a+bX since Σx = 0, Yc = 91.81+ (-2.1*10), Yc = 91.81 – 21, Yc = 70.81. The time series analysis under study here the last three years (2013-2015) the single contributors research papers always close to each other and the research document output may take a decreasing trend throughout the years to come.

Multi authored publications: time series analysis: Straight line formula Yc = a+bX since Σx = 0, a=ΣY/N, ΣY = (Total Number of research documents by Multi Author), N = (Number of Years), a = 6830/11, a = 620.90, b=ΣXY/Σ, ΣXY = (Total of XY Tables), Σ = (Total of X2 Table), b= 2525/110, b= 22.95.

Estimated literature in 2020 is, When X = 2020-2010(Mid-Year), X = 10, Apply straight line formula, Yc = a+bX since Σx = 0, Yc = 620.90+ (22.95*10), Yc = 620.90+229.5, Yc = 850.4.The time series analysis proves that the multi-authorship pattern is unstable regularly and the research document growth may take a booming trend during the years to come.

Conclusion

The findings of the study are summarized as follows: i. It could be said that the numbers of research documents published from 2005 to 2015 are considerably not close to each other. ii. It has been observed that the year 2006 has the highest number of publications (17.0%) followed by 2014 (14.40%), 2008 (12.70%) and 2015 (11.80%) respectively. iii. It is clear that relative growth rates has decreased from 2006 (1.66) to 2015 (0.12) in the 11 year period. The Doubling time increased from 0.42 in 2006 to 5.77 in 2015. iv. It could be identified that the four authored articles involved highest percentage 1327 (16.93%). v. The analysis found that a single author papers and multi-authored papers are very low during the period of 2009 – 2011. vi. It was found that the future trend and development in Psycho Oncology research output may take a decreasing trend in single authored publications (Yc = 70.81) during the years to come and multi-authored, research literature output may take an increasing trend during the years to come (Yc = 850.4).

References

1. Kumar Senthil R. and Muthukrishnan M. (2016). Scientometric analysis of "annals of oncology" during 2010-2014. *Kongunadu Research Journal*, 3(2), 117-122.

2. Das Kumar Prabir (2015). Authorship Pattern and Research Collaboration of Journal of Informetrics. *International Journal of Information Dissemination and Technology*, 5(1), 53-62.

3. Rajgoli Iqbalahmad U. and Laxminarsaiah Ashalatha (2015). Authorship pattern and collaborative research in the field of spacecraft technology. *The Electronic Library*, 33(4), 625-642.

4. Ramakrishnan J. and Thavamani K. (2015). Authorship Pattern and Collaborative Research in the Field of Hepatitis C. *Asian Journal of Information Science and Technology*, 5(1), 23-32.

5. Thavamani K. (2015). A Study of Authorship Patterns and Collaborative Research in Collaborative Librarianship, 2009-2014. *Collaborative Librarianship*, 7(2), 84-95.

6. Navaneetha Krishnan S. (2014). Authorship patterns and degree of collaboration of Sri Lankan scientific publications in Social sciences and Humanities - A picture from SCOPUS. *Library Philosophy and Practice (e-journal),* 1153.

7. Mani K.T. (2014). Authorship Patterns and Collaborative Research in Malaysian Journal of Library and Information Science, 1996 - 2012. *Library Philosophy and Practice (e-Journal),* 1177.

8. Velmurugan C. (2014). Authorship Pattern and Collaboration Research Output of Indian Journal of Pure and Applied Physics (IJPAP). *International Journal of Art & Humanity Science (IJAHS),* 1(2), 37-41.

9. Bales M.E., Dine D.C., Merrill J.A., Johnson S.B., Bakken S. and Weng C. (2014). Associating co-authorship patterns with publications in high-impact journals. *Journal of Biomedical Informatics*, 52, 311-318.

10. Arya Chanda and Sharma S. (2012). Authorship trends and collaborative research in veterinary sciences: a bibliometric study. *Chinese Librarianship: An International Electronic Journal*, 34, 38-47.

11. Pradhan Pallab, Panda Saroj and Chandrakar Rajesh (2011). Authorship Pattern and Degree of Collaboration in Indian Chemistry Literature. Souvenir from 8th International CALIBER, Goa University, Goa, 02nd – 04th March, 691-699.

12. Zafrunnisha N. and Pullareddy V. (2009). Authorship pattern and degree of collaboration in psychology. *Annals of Library and Information Studies*, 56, 255–261.