

AUTHORSHIP PATTERN AND COLLABORATIVE RESEARCH ON NEPHROLOGY LITERATURE IN INDIA: A SCIENTOMETRIC PROFILE

Chandran Velmurugan* and Natarajan Radhakrishnan

Department of Library and Information Science
Periyar University Salem, Tamilnadu, India

Corresponding Author: murugan73@gmail.com

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ABSTRACT

This paper tries to explore the scholarly research publications on Nephrology which was published by Indian scientists during 2010-2015. To collect the data Web of Science (WoS) core collection database has been used. A total 2622 scholarly publications with 11993 global citations were found for analysis. This paper focus the various bibliographic forms of Nephrology literature include articles, reviews, article based proceedings papers, correction and editorial materials. This paper deals with in terms of authorship pattern, single versus joint - authored research publications, ranking of core journals, document and geographical wise distribution.

Keywords: Nephrology, Scientometrics, Publication analysis, Research trends, WoS, India.

INTRODUCTION

Nephrology is the study about kidneys and its related diseases. The nephrologists deal with the diagnosis and management of kidney diseases. The kidneys are vital for maintaining normal fluid and electrolyte balance in the body. Nephrologists deal with kidney disorders including fluid and electrolyte disorders, acid-base disorders, kidney stones, glomerular diseases, tubulointerstitial diseases, mineral metabolism, acute kidney disease, acute renal failure, chronic kidney diseases, chronic renal failure and end stage renal disease and dialysis. To identify the growth and development of recent trends of Nephrology literature and to know the performance and also to support and strengthen of Nephrology discipline, researchers have chosen this topic to evaluate and compute the analysis by means of scientometric observations. Scientometric analysis is employed by the research scientists to study the growth of scientific publications in given science field specifically. This study is based on the bibliographic analysis which was first used the term by Pritchard (1969) as the application of statistical and mathematical methods to books and other communications. As this scientometric research is the one of the emerging thrust areas of research and integrating several branches of individual knowledge.

A number of scientometric related studies have already examined on various fields by eminent research scholars and scientists. A few of them were chosen for the present study. Karaulova, et al (2016) investigated on nanotechnology research in Russia with 83 regions, 261 institutes publishing on Nanoscience were located in 40 of these regions. Moscow, Moscow Region, St. Petersburg, and Novosibirsk published Russian nanotechnology papers, contributing over 80 % of the total output

and Moscow was the leading with 35 % of all RAS publications. It was found that Physics was the dominant subject category in the disciplinary structure of the nanotechnology literature output. Liang et al (2015) evaluated the quantitative and qualitative based research articles from various countries related to arthroscopy to examine the salient features of global wise literature output. The web of science search engine was used to collect the publications for the period from 1999 to 2013. The major proportion of research papers were published by North America, Western Europe and Eastern Asia and the high income countries produced more than 90 percent of articles.

Velmurugan and Radhakrishnan (2016) analyzed on Nanotechnology in global level as well as national level, Nanotechnology Literature in Canada using web of science core database in different periods. In 2016, conducted a survey in terms of publication analysis on Phytochemistry in Switzerland (Velmurugan and Radhakrishnan, 2016), Pattern of Collaborative Research on Malaysian Journal of Library and Information Science (Velmurugan and Radhakrishnan, 2016), research productivity on Library Herald (Velmurugan and Radhakrishnan, 2016), Research Analysis on Biotechnology (Velmurugan and Radhakrishnan, 2014), Pharmacognosy, (Velmurugan and Radhakrishnan, 2015), Authorship Trends and Collaborative Research on DESIDOC Journal of Library and Information Technology (Velmurugan and Radhakrishnan, 2015).

The objectives are framed to analyze the research productivity on Nephrology for the present study. The objectives are to identify the growth rate of research productivity on Nephrology, to examine the growth rate of collaborative research, to find out the Year wise authorship pattern, to know the Authorship pattern and to verify the degree of collaboration over the study period.

METHODOLOGY

The data were collected on 12 October 2015 from the Web of Science Core Collection database by using the keywords which are given below:

- TOPIC: Nephrology
- Refined by: COUNTRIES/TERRITORIES: (INDIA)
- Time span: 2010-2015. Indexes: SCI-EXPANDED, SSCI, A&HCI, ESCI.

The data were exported to MS Excel spreadsheet to analyze statistically and tabulated and figured. This study covers a period of five years from 2010 to 2015 (both the years inclusive). All the records during the period of study have been downloaded completely from the Web of Science online database. The researchers have applied percentage analysis and average score analysis as the basic tools. Apart from the above the specific bibliometric statistical tools such as Collaborative Index (CI), Degree of Collaboration, R2 Value, Regression analysis, Simple percentage analysis, Mean value, Standard Deviation (SD) and Co-efficient of variance (CV) have applied. Further, software tools such as HistCite and VOS viewer have also been used to evaluate the data.

EXPERIMENTS AND ANALYSIS

1. Year-wise growth on Nephrology

Table 1 shows that out of 2622 research papers, the highest number of papers i.e. 510 (19.5%) scholarly publications with 1707 total global citations and 185 total local citations which are ranked in first in 2013. The lowest number, i.e. 382 (14.6%) research output with 3098 total global citation

score and the total local citation score is 365 in the year 2010. It is identified that the average number of research articles are 437 and also standard deviation and co-efficient variance have been calculated during the period of study.

Table 1: Year-wise growth of literature on Nephrology

S. No	Year	Records	%age	TLCS	TGCS
1	2010	382	14.6	365	3098
2	2011	400	15.3	411	2879
3	2012	473	18.0	306	3304
4	2013	510	19.5	185	1797
5	2014	466	17.8	88	789
6	2015	391	14.8	23	126
Total		2622	100	1378	11993
Mean		437		229.67	1998.83
Standard Deviation		52.869		156.07	1318.95
C.V		0.121		0.67	0.65

2. Authorship Pattern

It is observed from the table 2 that about 90% of papers was contributed by multi authors. Out of 633 papers, the highest number of papers was published by double authors which accounts for 203 (32.07%) followed by three authored articles which lead 198 (31.28 %) 17.38% of articles were published by four authors.

Table 2: Authorship pattern

S. No	Author	Recs	%age	TLCS	TGCS	TLCR
1	Anonymous	36	1.4	0	0	0
2	Jager KJ	28	1.1	10	190	15
3	Zoccali C	26	1.0	9	230	15
4	Jhaveri KD	24	0.9	71	91	88
5	Craig JC	22	0.8	11	69	14
6	De Nicola L	16	0.6	6	109	12
7	Garg AX	16	0.6	30	242	12
8	Minutolo R	16	0.6	6	109	12
9	Ronco C	16	0.6	7	183	3
10	Schaefer F	16	0.6	9	77	17

3. Authorship Pattern of Publications

Table 3 represents the details about the authorship pattern with total number of contributions Out of 2622 articles, the majority of (61.82 %) papers which are contributed by three authors and followed by single authors (13.84 %) 335 (12.77%) were contributed double authors and only 303(11.55%) were published by three authors.

Table 3: Authorship Pattern of Publications

Pattern	No. of contribution	Percentage
Single authors	363	13.84
Double authors	335	12.77
Three authors	303	11.55
>than three authors	1621	61.82
Total	2622	100

4. Year wise Author Productivity

Table 4 provides the information about the year wise authorship patterns during the period of study. The highest number (61.82%) of journal papers were published by more than three authors and followed by single authors with 363 contributions (13.84 %). 12.77% of contributions were done by double authors and the minimum number of (11.55%) contributions were by three authors.

Table 4: Year wise Author Productivity

Author	Year						Total	Percentage
	2010	2011	2012	2013	2014	2015		
Single	78	61	56	86	49	33	363	13.84
Double	52	48	61	71	46	57	335	12.77
Three	40	41	65	53	62	42	303	11.55
>than three	212	250	291	300	309	259	1621	61.82
Total	382	400	473	510	466	391	2622	100

5. Single and Joint Contributions

Table 5 represents that out of 2622 articles the maximum number publications 86.15% were done by joint authors while the rest 363 (13.85%) papers were contributed by single authors. It is found that the majority of the articles have been contributed only by solo author.

Table 5: Authorship Pattern of Single and Joint Contributions

Author	Year						No of papers	Percentage
	2010	2011	2012	2013	2014	2015		
Single	78	61	56	86	49	33	363	13.85
Joint	304	339	417	424	417	358	2259	86.15
Total	382	400	473	510	466	391	2622	100

6. Degree of Collaboration (DC)

Table 6 shows the degree of collaboration (DC) on authorship in the field of Nephrology during the period of study. It is very clear that the percentage of single authored is more than multi- authored papers. To estimate the degree of collaboration in quantitative terms, the formula given by K Subramanyam was used. The degree of collaboration ranges from 0.79 to 0.91 and the average degree of collaboration is 0.86.

Table 6: Degree of Collaboration (DC)

Year	Single authored	Multi-authored	Total Output	DC
2010	78	304	382	0.79
2011	61	339	400	0.85
2012	56	417	473	0.88
2013	86	424	510	0.83
2014	49	417	466	0.89
2015	33	358	391	0.91
Total	363	2259	2622	0.86

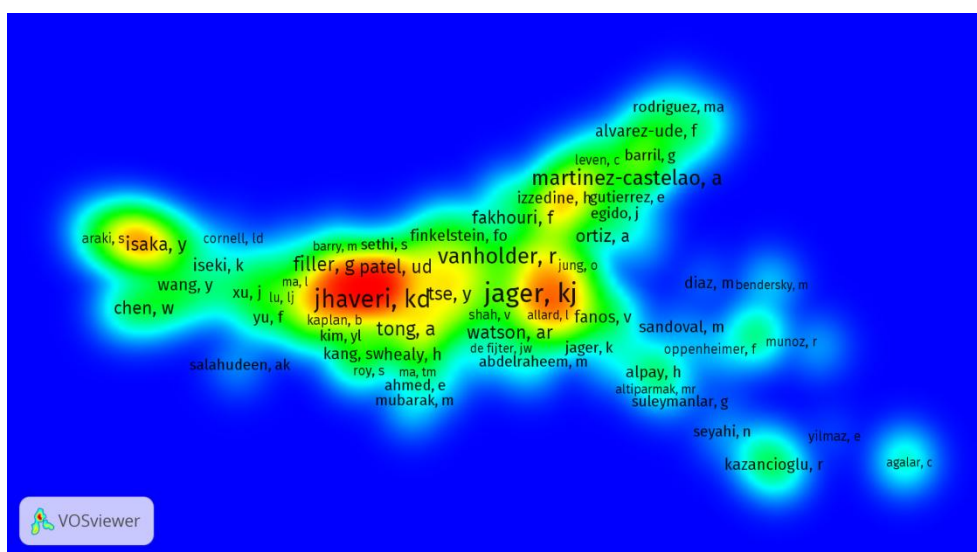
7. Pattern of Collaborative Index

Table 7 shows the pattern of collaborative index has been evaluated among the total research papers and total number of authors on Nephrology during the period. The results showed that the range of collaborative index is from 0.15 to 0.19 between 2010 and 2015. The maximum range of collaborative index is 0.19 in 2010.

Table 7. Pattern of Collaborative Index

Year	Total Articles	Total Authors	CI
2010	382	1922	0.19
2011	400	2149	0.18
2012	473	2705	0.17
2013	510	2743	0.18
2014	466	3008	0.15
2015	391	2531	0.15
Total	2622	15058	0.17

Pattern of co-authorship - map (Density value)



This map shows the density value based visualization of co-authors

8. Ranking of Journals

Table 8 indicates that top- 25 ranking of journals according to their productivity. Six journals have published 2622articles. The American Journal of Kidney Diseases was ranked first (global citation) 1101(5.5%), The Nephrology Dialysis Transplantation is in second rank (global citation) 765 (5.5%), The Clinical Journal of the American Society of Nephrology got ranked third (global citation 1324) (5.3%) during the period of study. The Pediatric Nephrology was placed fourth (global citation) 404(5.0%) articles during the period of study.

Table 8: Ranking of core journal’s in Nephrology

S. No	Journal	Recs	%	TLCS	TGCS	TLCR
1	American Journal of Kidney Diseases	143	5.5	239	1101	154
2	Nephrology dialysis transplantation	142	5.4	72	765	64
3	Clinical Journal of the American society of Nephrology	140	5.3	271	1324	127
4	Pediatric Nephrology	130	5.0	52	404	49
5	Kidney International	93	3.5	79	899	58
6	Nefrologia	79	3.0	39	230	60
7	Journal of Nephrology	75	2.9	21	140	24
8	Nephrology Nursing Journal	66	2.5	16	89	21
9	Nephrology	65	2.5	13	101	21
10	American Journal of transplantation	62	2.4	0	120	2
11	Seminars in Dialysis	57	2.2	22	265	40
12	Nephron clinical practice	51	1.9	40	221	20

9. Document-wise distribution

From the analysis, it is found different types of literature output in the forms of research Article, Review, Editorial Material, Meeting Abstract, Letter, Article; Proceedings Paper News Item, Biographical-Item, Correction, Article; Book Chapter and Review; Book Chapter. Based on the analysis, the result shows that out of 2622, the majority of (69.5%) papers from journal articles with 9151 global citations has been placed in first position and followed by 304 (11.6%) reviews, 230 (8.8%) editorial material, 165 (6.3%) meeting abstract, 41 (1.6%) letter, 25 (1.0) proceeding papers, 11 (0.4) News items, 9 (0.3) Bibliographic item, 9 (0.3) Correction, 3 (0.1) Article; book chapters, 2 (0.1) Reviews; book chapter were found during the study period. It is interesting to note that based on the global citation score in the field of Nephrology; review manuscript has been placed in first position with 9151 TGCS, and followed by articles with 2234 TGCS which has occupied in the second place. It is noticed that most of the manuscript has cited in the form of articles globally. When a compared with documents there is a significant between journal articles and other document.

10. Geographical wise distribution

Researchers have analyzed country wise distribution during the study period. Out of 108 countries, USA has been placed with 845 research output and the percentage rate is 32.2 and also the global citation score is 5306 and has got the first place based on the record count and followed by Italy which has 216 records with 1634 global citation score and occupied the second rank, Canada got next position with 206 articles with 1912 citation score, and followed by UK has 202 records with 1732 citation score globally which is ranked fourth. It is found that the USA has been placed in first place based on the majority of citation score i.e. 5036 which got Canada has been ranked second and followed by UK had got placed third with 1732 citation score. Based on the above analysis, there is a significant relationship between institution and country production during the period of study.

RESULTS AND DISCUSSIONS

This study has been carried on Research productivity of Indian Scientists on nephrology from 2010 to 2015. The data were collected from web of science database by using the document search provision in science citation index and analyzed through HistCite software. This study has focused authorship pattern, single authors versus joint authors relationship, degree of collaboration, pattern of co-authorship index, and collaborative research on Nephrology and related features such as document, geographical wise distribution, and ranking of core journals and noticed which was the predominant journal during the period of research. The major findings and results were listed below.

It was measured that the highest (0.83%) of papers were published in 2013 and the collaborative research has also been measured in the field of nephrology in terms of literature output. The USA has maximum number of literature output and it is ranked first. The degree of collaboration (DC) was determined among the productivity of authors. The percentage of multi-authored is more than that of single-authored papers and the average degree of collaboration was 0.86. The pattern of collaborative index was evaluated and the maximum range of collaborative index was 0.19 in the years 2010 respectively.

- ❖ It was examined that the majority of (19.5%) scholarly papers were published in 2013 and the least number of (14.6%) papers were published in 2010. It was noted that the growth rate of research output in Nephrology has gradually increased during the period of study.
- ❖ Out of 2622, the majority of 1823 (69.5%) papers are journal articles with 9151 global citations which got placed in first place and followed by 304 (11.6%) reviews, 230 (8.8%) editorial material, 165 (6.3%) meeting abstract, 41 (1.6%) letter, 25 (1.0) proceeding papers, 11(0.4) News item, 9 (0.3) Bibliographic item, 9 (0.3) Correction, 3 (0.1) Article; book chapter, 2 (0.1) Review and chapters are found during the study period. It is interesting to notes that the global citation score in the field of Nephrology, review manuscript has placed first.
- ❖ The authorship pattern with total no of contributions (2622) in which the majority of (61.82 %) papers contributed by more than three authors and followed by 363 (13.84 %) through have single authors; (12.77%) of contributions have been double authors and only 303(11.55%)papers have been published by three authors.
- ❖ The highest number (61.82%) of journal papers have more than three authors and followed by 363 contributions i.e. 13.84 % have single authors; 12.77 % of contributions have double authors and the minimum number of (11.55%) contributions have three authors.
- ❖ Out of 2622 articles the maximum number publications were published by joint authors (86.15%) while the rest of 363 (13.85%) papers were contributed by single authors. It is found that the majority of the articles have been contributed only by solo author.
- ❖ The degree of collaboration (DC) on authorship was analyzed presented in the field of Nephrology during the period of study. It is very clear that percentage of single authored is more than multi- authored papers. The degree of collaboration ranges from 0.79 to 0.91 and the average degree of collaboration is 0.86.
- ❖ The pattern of collaborative index has been evaluated among the total research papers and total number of authors on Nephrology during the period. The study revealed that the range of collaborative index is from 0.15 to 0.19 between 2010 and 2015. The maximum range of collaborative index is 0.19 in 2010.
- ❖ It was identified the source journals in Nephrology research. The maximum number of (145, - 5.522%), research papers were contributed by American Journal of Kidney Diseases and ranked first, and followed by Nephrology Dialysis Transplantation with 142 articles (5.407%).

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