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A SCIENTOMETRIC ANALYSIS ON NEPHROLOGY RESEARCH OUTPUT DURING 1990-2014

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Abstract

Nephrology is the hoariest conception and study of Kidneys related disease. To evaluate and identify the growth pattern of literature output, a total 5496 scholarly communications as a sample data has been gathered for the analysis of Nephrology from the Web of Science (WOS) citation database during the period between 1990 and 2014. This paper aim to scrutinize the several elements such as type of document, Language, Country, Institution wise, country wise production, research areas and keywords of literature output.

Keywords: Literature Trends, Scientometrics, Bibliometrics, Nephrology, Authorship pattern, DC, Institution, Country.

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Introduction

Nephrology is the adult and paediatric study of the 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 orders including:

- ➢ Fluid and electrolyte disorders
- ➢ Acid-base disorders
- ➢ Kidney stones
- ➢ Glomerular diseases
- ➢ Tubulointerstitial diseases
- ➢ Mineral metabolism
- ➢ Acute kidney disease
- ➢ Acute renal failure
- ➢ Chronic kidney disease
- ➢ Chronic renal failure
- ➢ End stage renal disease and dialysis

They need to be well aware of medications and clinical pharmacology, high blood pressure management, diabetes management an its complications, epidemiology of diseases and infections as well as nutritional management for prevention and treatment of kidney related diseases.

ROLE OF NEPHROLOGIST

As specialists, patients usually visit nephrologists on referral from primary care physicians. Nephrologists take blood and urine tests to establish how the patient's kidneys are functioning. They also employ ultrasound to examine the kidney. The number of patients with chronic renal failure and end-stage renal disease continues to increase. Nonetheless, there are increasing pressure to decrease the number of nephrologists. To provide highly specialized care for these complex patients, nephrologists must render less care for more patients, or allow less qualified providers to render care. Use of a highly specialized professional colleague, the trained nephrology nurse practitioner, allows the nephrologist to provide care for a great number of patients while maintain quality using an integrated collaborative practice model.

HYPOTHESES

There is a significant relationship between Journal articles and other documents.

1. There is a significant relationship between single and Collaborative authors.
2. There is a significant relationship between institution and country wise production.

MATERIALS AND METHODS

From Web of Science Core Collection citation database such as SCI-Expanded, SSCI, A&HCI were used to collect the data as primary source. We select the search option and the search item Nephrology in topic filed with the limitation of 26 years duration from 1990 to 2014. In result, we found a total of number of 5496 scholarly communications as a sample for data analysis. The research performance work is done in the month of September 2016. The retrieved data has different categories includes articles, review, editorial material, meeting abstract, proceeding papers, letter and notes. Moreover, the data has been transferred to Excel spread sheet for further analysis. For sample data and visual representation of author productivity, VOS viewer software and publish and perish (PoP) software have been employed.

OBJECTIVES OF THE STUDY

1. To examine the types of document and to identify the types of language.
2. To assess the year wise publication and growth pattern of literature for a period of study.
3. To study the most prolific authors and most prolific journals.
4. To describe the Institution wise and country wise production.
5. To find out the major themes of research productivity in the field of Nephrology.
6. To show the keywords of literature output and determine the degree of collaboration.

ANALYSIS AND RESULTS

1. Publication Year wise research output

Form the web of science database, we retrieved the various types of literature output in the forms of research articles, editorial material, review, meeting abstract, proceeding papers, letter, biographical-items, and notes. Based on the analysis, the results show that out of 5496, the majority of 3501 (63.7%) articles with 55727 global citations has placed in the first place years and followed by 663 (12.1.9%) editorial material, 556 (10.1%) reviews, 663 (12.1.9%) editorial material, 291 (5.3%) meeting abstract, 313 (5.7%) proceeding papers and the least number of document in the form of biographical-item, book review and note are (each 1, 0.30%) found during the study period. It is interesting that based on the global citation score in the field of Nephrology, review manuscript has placed in first position with 2008 TGCS, and followed by articles with 74540 TGCS has occupied in the second place. It is noticed that most of the manuscript has cited in the form of reviews globally (Table 1 and Figure 1. In this analysis, compare with documents there is a significant relationship between Journal articles and other documents.

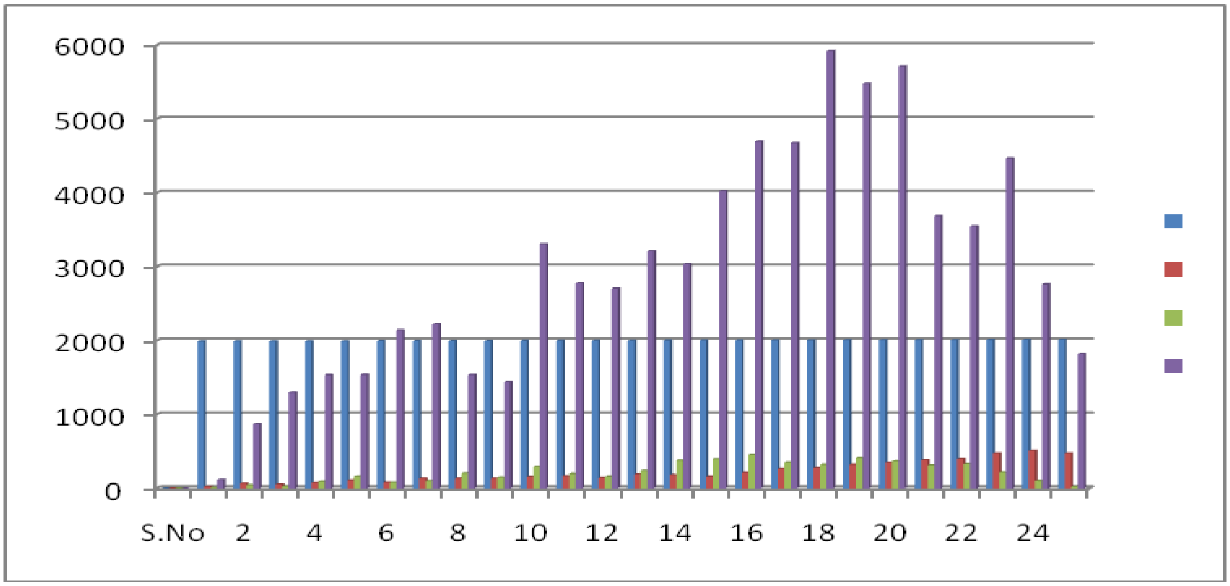
Table: 1 Publication Year Wise Distribution

S.No	Publication Year	Records	%	TLCS	TGCS
1	1990	24	0.43	10	117
2	1991	68	1.24	45	869
3	1992	55	1.00	29	1297
4	1993	77	1.40	93	1535
5	1994	108	1.97	164	1539
6	1995	79	1.44	81	2145
7	1996	138	2.51	103	2222
8	1997	136	2.47	206	1537
9	1998	136	2.47	150	1440
10	1999	157	2.86	295	3308
11	2000	168	3.05	199	2778
12	2001	143	2.60	160	2708
13	2002	191	3.48	240	3211
14	2003	184	3.35	380	3037
15	2004	160	2.91	398	4025
16	2005	214	3.89	454	4696
17	2006	267	4.86	351	4678
18	2007	280	5.09	323	5921

19	2008	323	5.88	416	5477
20	2009	349	6.35	369	5714
21	2010	382	6.95	314	3688
22	2011	400	7.28	331	3548
23	2012	473	8.60	220	4466
24	2013	511	9.30	104	2762
25	2014	473	8.60	23	1822
Total		**5496**	**100**	**5458**	**74540**

Figure – 1

Publication Year Wise Research Output with Citations



2. Document wise research output

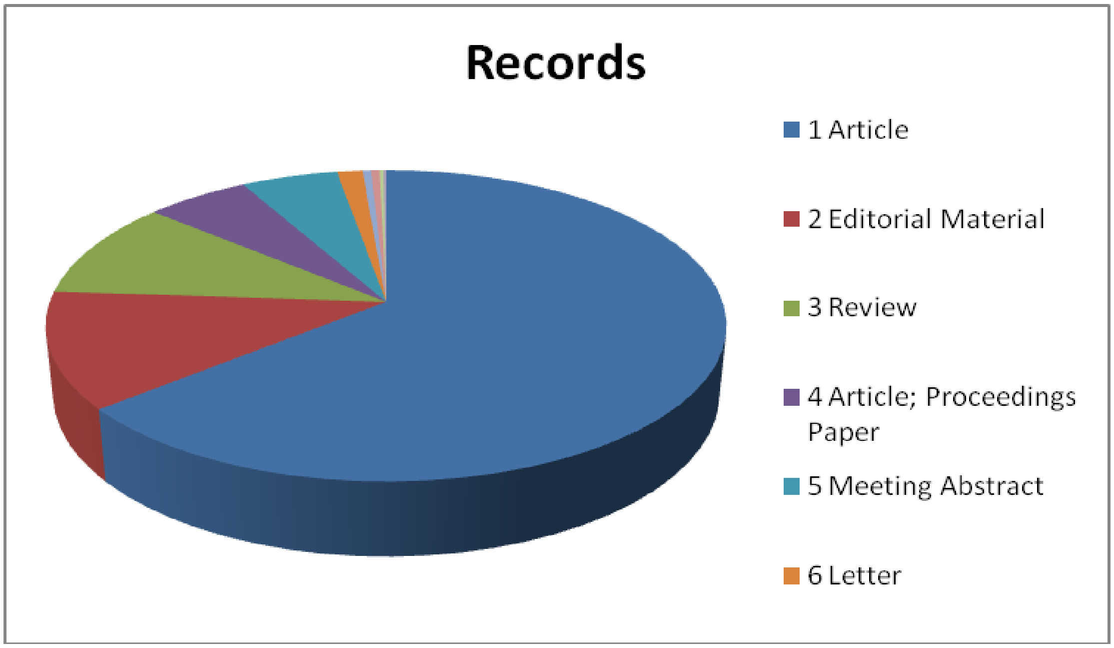
Form the web of science database, we retrieved the various types of literature output in the forms of research articles, editorial material, review, meeting abstract, proceeding papers, letter, biographical-items, and notes. Based on the analysis, the results show that out of 5496, the majority of 3501 (63.7%) articles with 55727 global citations has placed in the first place and followed by 663 (12.1.9%) editorial material, 556 (10.1%) reviews, 663 (12.1.9%) editorial material, 291 (5.3%) meeting abstract, 313 (5.7%) proceeding papers and the least number of document in the form of biographical-item, book review and note are (each 1, 0.30%) found during the study period. It is interesting that based on the global citation score in the field of Nephrology, review manuscript has placed in first position with 2008 TGCS, and followed by articles with 74540 TGCS has occupied in the second place. It is noticed that most of the manuscript has cited in the form of reviews globally (Table 1 and Figure 1. In this analysis, compare with documents there is a significant relationship between Journal articles and other documents.

Table: 2 Document Type

S.No	Document Type	Records	Percent	TLCS	TGCS
1	Article	3501	63.7	4071	55727
2	Editorial Material	663	12.1	405	2520
3	Review	556	10.1	392	10947
4	Article; Proceedings Paper	327	5.7	513	4897
5	Meeting Abstract	299	5.3	8	33
6	Letter	77	1.4	35	106
7	News Item	28	0.5	15	47
8	Biographical-Item	25	0.5	4	12
9	Correction	12	0.2	1	3
10	Note	8	0.1	4	49
		5496	100	5448	74341

Figure – 2

Document Type Wise Research Output with Citations



3. Language wise research output in the field of Nephrology

Form the web of science database, we retrieved the various types of literature output in the forms of English, Spanish, French, German, Russian, Portuguese, “Italian, Turkish, Serbian, Polish, Korean, Chinese, Iceland and Rumanian. Based on the analysis, the results show that out of 5496, the majority of 4772 (86.8%) English with 73052 global citations has placed in the first place and followed by 333 (6.05%) Spanish, 191 (3.47%) French, German 127 (2.31%), Russian 23 (0.4%), Portuguese 16 (0.3%), Italian 8 (0.1%) It is interesting that based on the global citation score in the field of Nephrology, review manuscript has placed in first position with 2008 TGCS, and followed by Languages with 74515 TGCS has occupied in the second place. It is noticed that most of the manuscript has cited in the form of reviews globally (Table 3 and Figure 3. In this analysis, compare with documents there is a significant relationship between English and other languages.

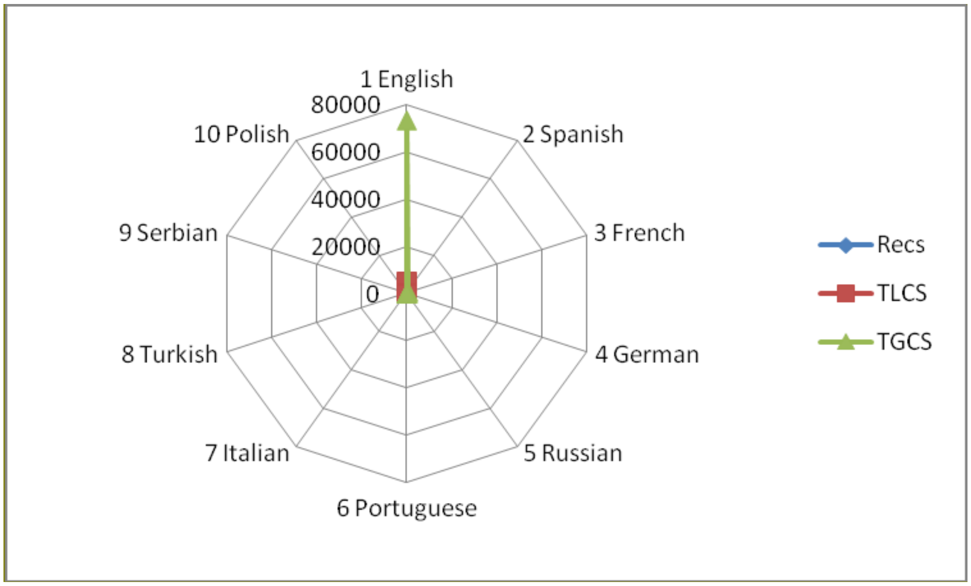
Table -3: Language wise research output

S.NO	Language	Recs	%	TLCS	TGCS
1	English	4772	86.82	5191	73052
2	Spanish	333	6.05	234	967
3	French	191	3.48	23	346
4	German	127	3.31	9	113

5	Russian	29	0.52	0	3
6	Portuguese	16	0.29	0	23
7	Italian	8	0.15	0	0
8	Turkish	8	0.15	0	4
9	Serbian	7	0.13	0	3
10	Polish	5	0.09	1	4
Total		**5496**	**100**	**5458**	**74515**

Figure -3

Language wise research output with citations



4. Institution wise research output

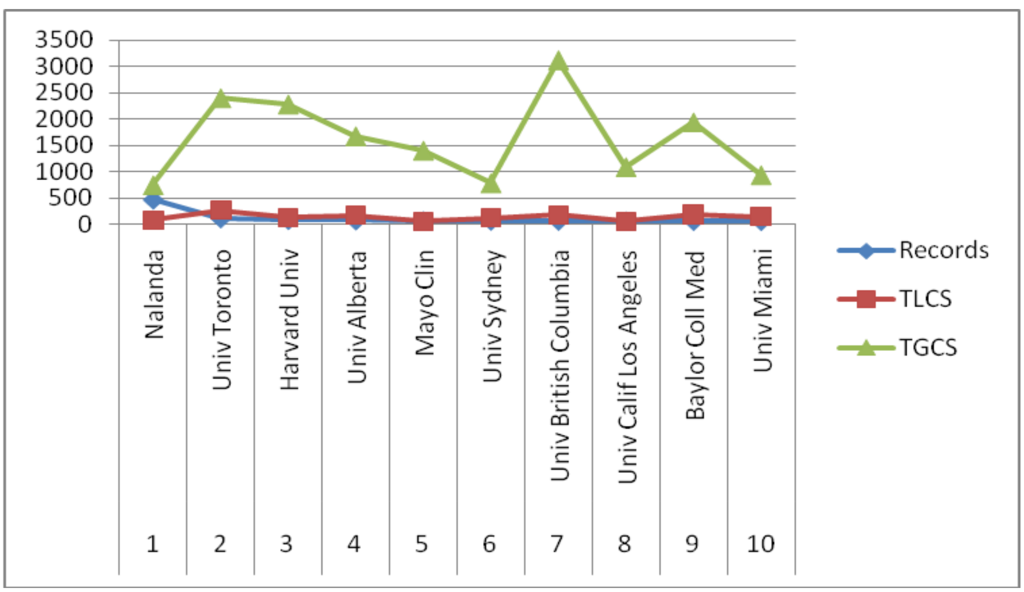
Table 4 shows that out of 5496, the majority of 467 (8.49%) Nalanda institution with 740 total global citations has placed in the first place and followed by 105 (1.91%) University of Toronto, 72 (1.31%) Harvard University, University of Alberta 66 (1.20%) Mayo Clin 64 (1.16%), Univ Sydney 60 (1.09%) It is interesting that based on the global citation score in the field of Nephrology, Univ Miami 53 (0.96)is a tenth place of Institution wise research report. It is noticed that most of the manuscript has cited in the form of reviews globally (Table 4 and Figure 4. In this analysis, compare with documents there is a significant relationship between Nalanda and other Institutions.

Table -4: Institution wise research Distribution

S.No	Institution	Records	%	TLCS	TGCS
1	Nalanda	467	8.49	64	740
2	Univ Toronto	105	1.91	269	2393
3	Harvard Univ	72	1.31	126	2275
4	Univ Alberta	66	1.20	169	1671
5	Mayo Clin	64	1.16	50	1398
6	Univ Sydney	60	1.09	115	777
7	Univ British Columbia	59	1.07	178	3115
8	Univ Calif Los Angeles	58	1.05	52	1085
9	Baylor Coll Med	56	1.01	183	1935
10	Univ Miami	53	0.96	139	932
	Total	1060	19.25	1345	16321

Figure – 4

Institution wise research output



5. Country wise research output

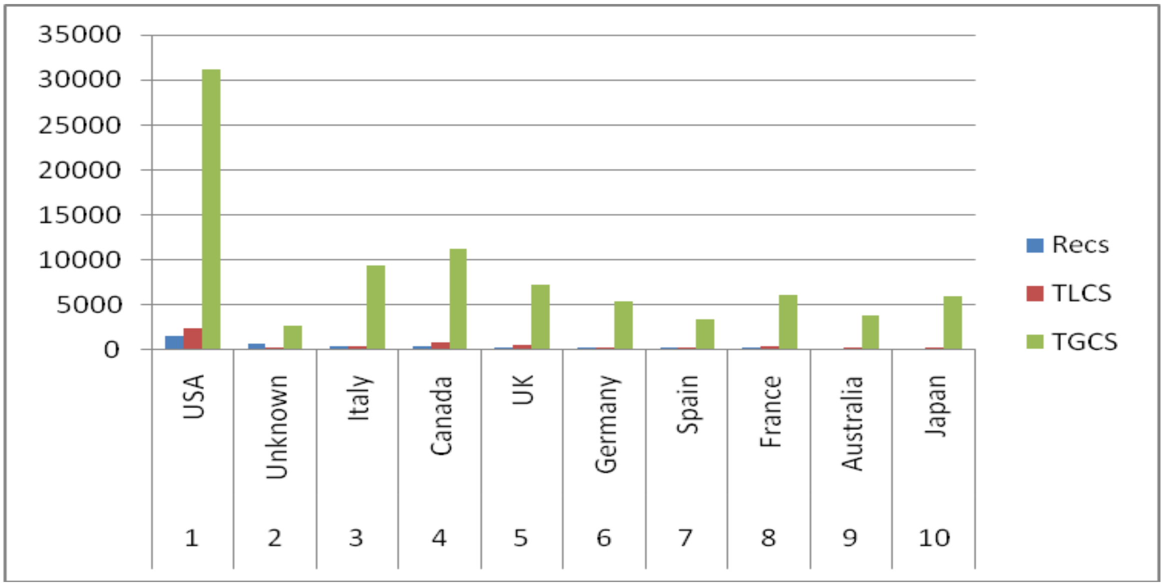
Form the web of science database, we retrieved the various types of literature output in the forms of research articles, review, editorial material, meeting abstract, proceeding papers, letter, biographical-items, and notes. Based on the analysis, the results show that out of 5496,In top the majority of 1538 (27.98%) articles with 31186 global citations has placed in the first 10 countries place and followed by 696 (12.66%) Unknown, 439 (7.98%) Italy, Canada 376 (6.84%) UK 354 (6.44%), Germany 352 (6.40%), Spain 334 (6.1%), France 310 (5.6%), Australia 204 (3.7%) and Japan 165 (3.0%) and other countries records. It is interesting that based on the global citation score in the field of Nephrology, review manuscript has placed in first position with 2008 TGCS, and followed by Languages with 31186 TGCS has occupied in the second place. It is noticed that most of the manuscript has cited in the form of reviews globally (Table 4 and Figure 4. In this analysis, compare with documents there is a significant relationship between USA and other countries.

Table - 5: Country wise research Distribution

S.No	Country	Recs	%	TLCS	TGCS
1	USA	1538	27.98	2415	31186
2	Unknown	696	12.66	250	2677
3	Italy	439	7.98	427	9330
4	Canada	376	6.84	796	11251
5	UK	354	6.44	556	7259
6	Germany	352	6.40	269	5424
7	Spain	334	6.10	337	3374
8	France	310	5.60	369	6185
9	Australia	204	3.7	334	3880
10	Japan	165	3.0	278	6020
Total		4768	86.7	6031	86586

Figure- 5

Country wise research output



5. Author wise research output

Form the web of science database, we retrieved the various types of author output in the forms. Based on the analysis, the results show that out of 16822, In top 10 of the majority of authors 226 (4.1%) Anonymous with nil global citations has placed in the first 10 author place and followed by 48 (0.9%)Ronco.C, 48(0.9%) Zoccali.C, Eknoyan.G 44 (0.8%), Levin A 43 (0.8%), Asif.A 40(0.7%), Jager KJ 34(0.6%), Locatelli F 23(0.4%), Craig JC 22(0.4%) and Dekkar FW 22(0.4%) and other author records. It is interesting that based on the global citation score in the field of Nephrology, Levin A has placed in first position with 4285 TGCS, and followed by Ronco C with 2785 TGCS has occupied in the second place. It is noticed that most of the author has cited in the form of globally (Table 6 and Figure 6). In this analysis, compare with documents there is a significant relationship between anonymous and other authors.

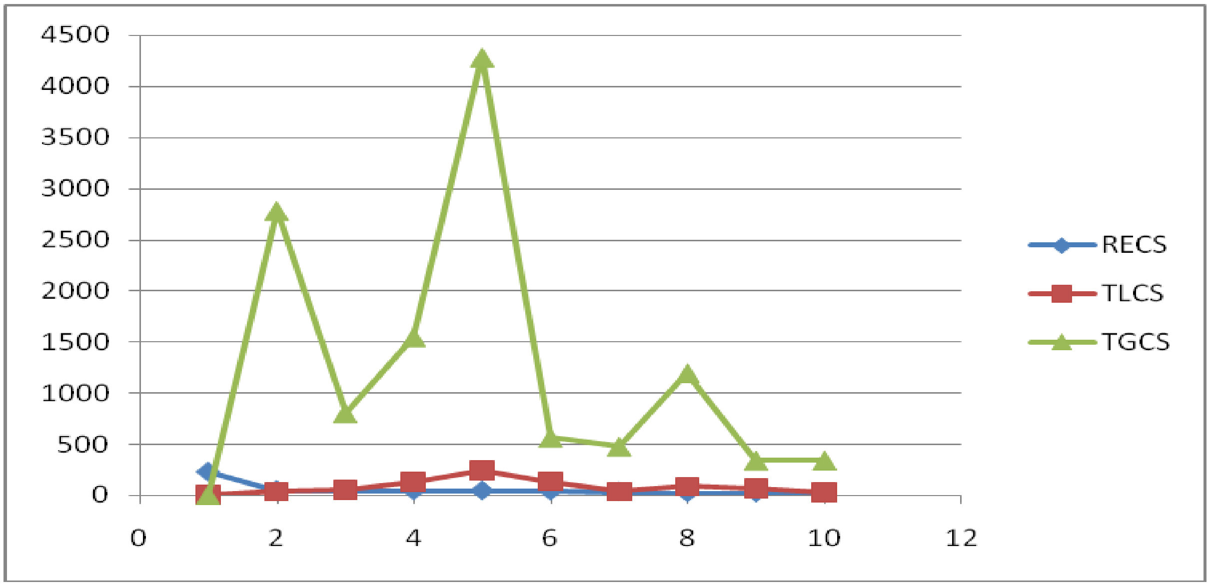
Table - 6: Author wise research Distribution

S.No	Author	Recs	%	TLCS	TLCS/t	TGCS
1	Anonymous	226	4.1	2	0.20	0
2	Ronco.C	48	0.9	36	4.05	2785
3	Zoccali.C	48	0.9	57	7.41	803

4	Eknoyan.G	44	0.8	132	13.14	1547
5	Levin.A	43	0.8	243	22.02	4285
6	Asif.A	40	0.7	133	14.23	562
7	Jager KJ	34	0.6	35	6.19	476
8	Locatelli F	23	0.4	86	8.10	1195
9	Craig JC	22	0.4	67	7.24	337
10	Dekkar FW	22	0.4	27	4.69	340

Figure- 6

Author wise research output



7. Journal wise research output

Form the web of science database, we retrieved the various types of journal output in the forms of nephrology. Based on the analysis, the results show that out of 854 journals. In top 10 of the majority of 282 (5.1%) Kidney International with 8498 global citations has placed in the first 10 countries place and followed by 285 (5.2%) American Journal of Kidney Diseases with 8105 global citations has second place of top 10 journals, 395 (7.2%) Nephrology Dialysis Transplantation, Paediatric Nephrology 304(5.5%) Nefrologia 259 (4.7%), Clinical Journal of the American Society of Nephrology 171(3.1%), Journal of Nephrology 171 (3.1%), Journal of the American Society of Nephrology 161(2.9%), Seminar in dialysis 110(2.0%) and Nephrology

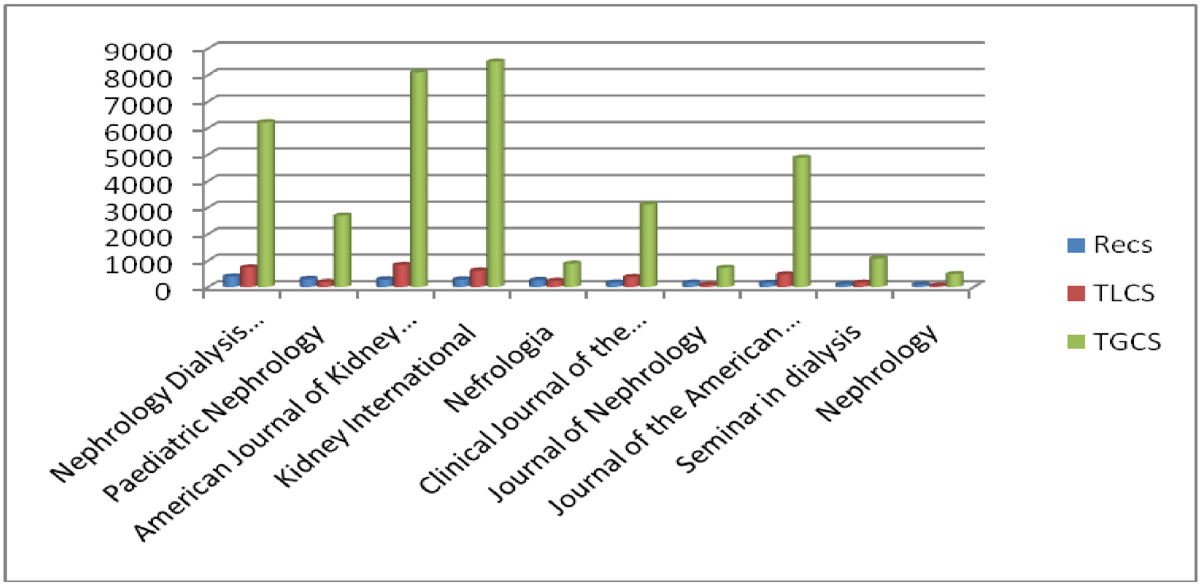
98(1.8%) and other journal records. It is interesting that based on the global citation score in the field of Nephrology, Kidney International has placed in first position with 8498 TGCS, and followed by American Journal of Kidney Diseases with 8105 TGCS has occupied in the second place, and followed by Nephrology with 489 TGCS has occupied in the tenth place of out of 854 journals. It is noticed that most of the journal has cited in the form of globally (Table 7 and Figure7. In this analysis, compare with documents there is a significant relationship between author comparing.

Table -7: Journal wise research Distribution

S.No	Journal	Recs	%	TLCS	TLCS/t	TGCS	TGCS/t	TLCR
1	Nephrology Dialysis Transplantation	395	7.2	736	78.50	6216	860.85	388
2	Paediatric Nephrology	304	5.5	191	23.99	2691	408.37	169
3	American Journal of Kidney Diseases	285	5.2	831	114.39	8105	1335.79	425
4	Kidney International	282	5.1	615	76.13	8498	1216.13	238
5	Nefrologia	259	4.7	230	27.54	881	159.63	359
6	Clinical Journal of the American Society of Nephrology	171	3.1	372	75.67	3120	739.93	370
7	Journal of Nephrology	171	3.1	86	11.04	720	111.72	160
8	Journal of the American Society of Nephrology	161	2.9	475	51.18	4877	510.89	140
9	Seminar in dialysis	110	2.0	166	19.23	1076	183.98	186
10	Nephrology	98	1.8	50	7.36	489	111.52	113

Figure-7

Journal wise research output



Conclusion

Our bibliometric study has raised a number of questions. We could show that the share if boundary spanning, interdisciplinary and interfiled publications is exceptionally high and still growing. This makes one wonder why nephrology is interdisciplinary to such an extent and why this trend seems to continue. Is it atypical phenomenon for emerging technologies? Is it because science is developing more rapidly in areas that areas that are carried out in an application context, as Gibbons et al. Another interesting question is what are the reasons for the varying developments of the different disciplinary fields? An analysis of citation frequencies might help identify some breakthroughs as explain factors. Our second major finding was that countries follow different patterns of collaboration. Some countries tend to have bilateral relations while others collaborate with a much larger array of nations.

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