Innovations

Scientometric Analysis of the Research Productivity on Epilepsy Disease

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Abstract

The present study deals with the trends in Epilepsy Disease at the world perspective. The aim of this study is to elaborate the scientific production of original and review articles published in the Epilepsy Disease journals for the study period 2012 to 2021, considering qualitative and quantitative measures from all over the countries. All the records were downloaded completely from the Web of Science (WoS) online database during the period of study. The total output was 18092 records from 2418 journals. The results show that the year 2021 was considered the most productive with 2546 (14.07%) publications. Among the authors, Striano P has published the highest number of 315 articles. From the study it can be concluded, this paper may be considered as a baseline study for the scientometric information related to articles on Epilepsy Disease published in the Web of Science. Further research using other databases like PubMed, Scopus, Chemical abstract, BIOSIS and Derwent Biotechnology Abstracts could be attempted.

Keywords: 1.Epilepsy Disease, 2.Scientometric, 3.Relative Growth Rate, 4.Web of Science

1. Introduction

Humans are endowed with the special power of discrimination between good and bad , this special technique has made the humans as unique individuals on earth. The special sense organ which helps to identify between various things is due to the presence of central nervous system in the human body. Brain is situated in the head region of human's beings which is responsible to carry out certain life process; Epilepsy is the condition in which the brain is not able to carry out everyday actions and reactions with a sense of responsibility. The individuals sufferings from epilepsy are seen with various psychological disturbances, depression, psychosis and anxiety are commonly observed features seen in person with epilepsy disease.

Epilepsy is a disease of central nervous system and shows its attendance in the form of stroke, migraine and in some cases loss of memory. It has been observed that the people suffered with disease show more prevalence of heart diseases, stress, anxiety, hypertension and chronic pulmonary diseases. A study conducted on different groups of people of Canada declares that the persons suffered from epilepsy are more prone to digestive ulcers and ulcerative colitis is preferably seen with the suffered people. In another report it is found that coorbid psychosis is mostly seen in persons suffered with epilepsy.

2. Objectives of the Study

a) To identify the prolific journals distribution on Epilepsy disease.

b) To find out the country producing most of the literature on epilepsy disease.

c) To find out the most dominating language in which the most of the articles on the epilepsy disease have been produced.

d) To know the most productive year of the literature published on the epilepsy disease.

e) To know the eminent authors in the field.

3. Research Methodology

The study was carried out based on the scientometric approach at the scholarly writings on Epilepsy subject field. All data are retrieved from Web of Science database available during 2012-2021 i.e. 10 years. A total of 18092 records were identified in the field of "Epilepsy Disease". All data were downloaded based on author affiliation and these records are analyzed on the basis of various quantitative technique. The collected data has been classified by using Histcite then by using Excel format for doing other calculations.

4. Literature Review

Bhardwaj, Ram and Kaushik (2013) studied on vitiligo which is a skin disease from the year 2001-2012. A totals of 4091 records have been selected during the period of study. The data has been divided into two groups of 6 years each and growth is compared. There has been a growth of 121.43% at rate of 20.24% annual growth during 2001-2006. In comparison to 2001-2006, the literature growth during 2007-2012 has been slow and achieved a growth rate of only 38.3% with an annual growth rate of 6.4%. Overall growth of the literature over a period of 12 years, it has been noted 218.8% with an annual growth of 18.2% year.Ma, Yao, Yao and Zhang (2014) conducted a scientometric study of translational medical research by using Science Citation Index Expanded (SCI-E), Social Science Citation Index and PubMed database from 1992 to 2012. The result indicated that translational medicine research had increased over past 20 years, particularly in the last 4 years with a total of 3,627 papers scattered over 1,062 journals listed in 91 SCI-E subject categories. They analyzed 20 most prolific countries and institutions and identified key papers. Experimental medicine, general internal medicine and medical laboratory technologies were the main focus of research. G7 countries led the research and the focus remained in the USA. American institutions outperformed in terms of quantum, citations and collaborations. Neoplasms and genomics, interdisciplinary communication between academic medical centres/institutes, drug design and development, cardiovascular and brain diseases and biomedical research appeared to be main topics of research.Brandt and Mula (2016) had studied the anxiety disorders and found that these types of feelings are very common in patients suffering from the disease and in some cases these remain unnoticed leads to further disturbance. Main centre responsible for the disease is neurobiological cells which are founded in animals, It mainly affects the person's routine activities and in some cases the person life was so disturbed that it leads to suicidal attempts by the patients in some cases the disease is resolved and the anxiety levels in the patients may be decreased. Certain drugs like serotonin inhibitors in continuation with benzodiazepines are used to cure the patients. Psychotherapy with the help of experts was in much use as it does not have any negative effects on the physical health.Velmurugan and Radhakrishnan (2016) conducted a study on scientific publications and the research productivity in Malaysian journal of Library and Information Science in the period from 2007-2014 a period of seven years. The findings shows that the highest production was published in 2011 i.e. 19.71% and lowest production was in the year 2014 i.e 9.86%. Their study also investigated the rank wise distribution of contributions in which 31.84% which is considered to be the highest from Malaysia bagged first position, followed by Iran 11.31% at the second rank and India bagged third position by 11.01 % of contributions and china gave 7.15% of contributions. The scientometrics tools like degree of collaboration, collaborative index, annual growth rate and relative growth rate were also used for data analysis and interpretations.Dhoble and Kumar (2017) they have analyzed the paper and studies the authorship pattern and Lotka's law applicability on the publications of mustard research output in India for the period of 2000-2013. Their study reveals that there is domination of collaboration of more number of authors per article in the publication activities in research. The study also indicates that there are 5664 no. of total authors. In which 65.2% have made their contribution in only one article. Two articles by 17.9% authors, three articles have been contributed by 3.4 % and 1.8 % of the total authors. There was only one author who has contributed 0.02% means no of articles 50 in number. The number of author's decreases with increase in number in articles. They applied Chi-Square test to test the hypothesis and found their applicability on their research.Alan et al. (2018) had discussed in their paper on epilepsy issues leading to mortality of the patients due to the occurrence of seizures. It is studied that the higher

propensity of premature mortality of the disease was measured due to long term effect; the study indicated that the disease was increased with the increasing factors of risk leading to premature death or the mortality of an individual with an increasing inflammation level, remain stressed most of the times with an increase in the glucose level. In the present study it was understand that epilepsy is the sum of seizures and problems caused by the non adjustment of the body system.

5. Data Analysis and Interpretation

5.1 Analysis of top 10 Journal wise distribution on global Epilepsy Disease

Table 1: Analysis of top 10 Journal wise distribution on global Epilepsy Disease.

Sl No	Journal	Rank	Frequency	Percentage
1	Epilepsy Behavior	1	886	4.90
2	Epilepsia	2	749	4.14
3	Neurobiology of Disease	3	388	2.15
4	Seizure European Journal of Epilepsy	3	388	2.15
5	Epilepsy Research	4	355	1.96
6	Plos One	5	298	1.65
7	Neurology	6	287	1.59
8	Frontiers in Neurology	7	240	1.33
9	Scientific Reports	8	168	0.93
10	Brain	9	165	0.91

Table 1 shows the top 10 journals according to their productivity from 2418 journals. In the collected data, all the 18092 references were found which have been ranked up to 9 positions. However, table 1 list shows only top 10 journals which the frequency of occurrence of item is up to 165. The journals with less than 165 items have not been considered. Table 1 shows that the first rank was occupied by the journal titled "Epilepsy Behavior" which accounts for 886 (4.90%) articles. Next 2 positions are occupied by journals like "Epilepsia" 749 (4.14%) articles and "Neurobiology of Disease" 388 (2.15%) articles during the period of study and the remaining journals are ranked according to number of their published articles. The inference of this table shows that journal of Brain is the lowest contribution i.e. 165 (0.91) articles.

5.2 Analysis of top 15 Country Wise Distribution of Epilepsy Disease

Table 2: Analysis of top 15 Country wise Distribution of Epilepsy Disease

Sl. No	Country	Rank	Records	Percentage
1	USA	1	5783	31.96
2	Peoples Republic of China	2	2198	12.15
3	Italy	3	2139	11.82
4	Germany	4	2026	11.20
5	England	5	1985	10.97
6	France	6	1166	6.45
7	Canada	7	1143	6.32
8	Netherlands	8	999	5.52
9	Australia	9	929	5.14
10	Japan	10	843	4.66
11	Spain	11	822	4.54
12	Switzerland	12	652	3.60

13	Belgium	13	600	3.32
14	Brazil	14	593	3.28
15	India	15	587	3.25

Table 2 indicates the country wise distribution of Epilepsy literature during 2012-2021. During the period, the researchers elected the top 15 countries output out of 173 countries. Among of 18092 publications, 5783 (31.96%) records have been shared by USA. The productivity shared by USA an appreciable hence. Peoples Republic of China comes into the second position which shared 2198 (12.15%) records. Italy stands by its third position having 2139 (11.82%) records. India holds fifteenth position getting 587 (3.25%) records. It could be identified that the country wise analysis the following countries USA, Peoples Republic of China, Italy, Germany, and England were identified the most productive countries based on the number of research papers published.

5.3 Ranking of Language and their Records

Table 3: Ranking of Language and their Records

Sl No.	Language	Rank	Records	Percentage
1	English	1	17709	97.88
2	Spanish	2	120	0.66
3	German	3	75	0.42
4	French	4	68	0.36
5	Hungarian	5	30	0.17
6	Russian	6	19	0.11
7	Polish	7	16	0.09
8	Czech	8	15	0.08
9	Chinese	9	12	0.07
10	Portuguese	10	11	0.06
11	Turkish	11	10	0.01
12	Korean	12	2	0.01
13	Croatian	13	1	0.01
14	Icelandic	13	1	0.01
15	Italian	13	1	0.01
16	Japanese	13	1	0.01
17	Slovenian	13	1	0.01
Total			**18092**	**100%**

Language plays a vital role in the communication of information. Table 3 shows that the total numbers of items (18092) were published 17 different languages. Out of which in English was found to be the most dominant language as 17709 items constituting (97.88%) were reported to be published in that language. The second position is occupied by Spanish in which 120 items constituted (0.66%). The third, fourth and fifth positions were occupied by German (0.42%), French (0.38%) and Hungarian (0.17%). Thus the most dominant language on the subject is English.

5.4 Analysis of Year Wise Distribution of Epilepsy Publication

Table 4: Analysis of Year Wise Distribution of Epilepsy Publication

Sl. No.	Years	Articles	Percentage	Cumulative No. of Articles
1	2012	1204	6.66	1204
2	2013	1408	7.78	2612
3	2014	1494	8.26	4106
4	2015	1535	8.48	5641
5	2016	1617	8.94	7258
6	2017	1757	9.71	9015
7	2018	1903	10.52	10918
8	2019	2117	11.70	13035
9	2020	2511	13.88	15546
10	2021	2546	14.07	18092
	Total	**18092**	**100%**	

Table 4 reveals that during the period of 10 years between 2012 and 2021, a total 18092 publications were published on Epilepsy disease. The highest number is found to be 2546 (14.07%) in 2021 followed by 2511 (13.88%) articles in 2020 and 2117 (11.70%) records in 2019. It is also found from the table that the lowest number is 1204 (6.66%) records in 2012. It is inferred from the analysis that there is a most productive year of 2021, 2020, 2019 and 2018 on Epilepsy Disease.

5.5 Analysis of Relative Growth Rate and Doubling Time of Publication

Table 5: Analysis of Relative Growth Rate and Doubling Time of Publication

Years	Articles	Cumulative No. of Articles	W1	W2	R(a) W2-W1	Mean R(a) (1-2)	Doubling Time Dt(a)	Mean Dt (a) (1-2)
2012	1204	1204	7.09	7.09	0.00	0.89		0.56
2013	1408	2612	7.25	7.87	0.62		1.12	
2014	1494	4106	7.31	8.32	1.01		0.69	
2015	1535	5641	7.34	8.64	1.30		0.53	
2016	1617	7258	7.39	8.89	1.50		0.46	
2017	1757	9015	7.47	9.11	1.64	1.80	0.42	0.39
2018	1903	10918	7.55	9.30	1.75		0.40	
2019	2117	13035	7.66	9.48	1.82		0.38	
2020	2511	15546	7.83	9.65	1.82		0.38	
2021	2546	18092	7.84	9.80	1.96		0.35	
Total	**18092**					**1.35**		**0.48**

It is very clear from the table 5 that the relative growth rate of total literature outputs published has been progressively improved. The growth rate is 0.62 in 2013, 1.01 in 2014. 1.30 in 2015, 1.50 in 2016, 1.64 in 2017 and in 2021 it has been increased to 1.96. The mean relative growth rate is 1.35 during the period 2012-2021. Generally, the relative growth rate of publications of all sources in this data has shown an increasing trend. The mean doubling

time is 0.48 during the period 2012-2021. In general, the doubling time of scholarly publications of all sources in this research output has also shown a decreasing trend.

5.6 Analysis of the Publication Output of Top 10 Authors

Table 6: Analysis of the Publication Output of Top 10 Authors

Sl. No	Author	Records	Percentage
1	Striano P.	315	1.74
2	Zara F.	116	0.64
3	Guerrini R	114	0.63
4	Scheffer IE	113	0.63
5	Lerche H	103	0.57
6	Moller RS	99	0.55
7	Wang Y.	96	0.53
8	Obeien TJ	90	0.50
9	Verrotti A.	90	0.50
10	Berkovic SF	86	0.48

The study of author productivity is an important aspect in analyzing the performance of research results. The analysis of author productivity examines the prevailing trend in carrying out research in any branch of science. Among the top 10 eminent authors, Striano P. published the highest number of publications such as 315 (1.74%) articles his name is the first. The second top prolific author is Zara F. He has published 116 (0.64%) articles. The third rank goes to Guerrini R. published 114 (0.63%) articles respectively. It could be identified that the authors wise analysis the following authors Striano P, Zara F., Guerrni R, Scheffer I E and Lerche H were identified the most were identified the most productive authors based on the number of research papers published.

6. Findings

i) From the study it is found that journal titled "Epilepsy Behavior" which accounts for 886 (4.90%) articles was occupied by first rank. Next 2 positions are occupied by journals like "Epilepsia" 749 (4.14%) articles and "Neurobiology of Disease" 388 (2.15%) articles during the period of study.

ii) Most of the literature on the subject "Epilepsy Disease" was found to be published form top 15 countries. USA is the leading country with 5783 (31.96%) items of the total. This is followed by Peoples Republic China and Italy 2198 (12.15%) and 2139 (11.82%) items respectively.

iii) The total numbers of items (18092) were published 17 different languages. Out of which English was found to be the most dominant language, followed by Spanish and then German , French and Hungarian consequently.

iv) From the above study it is to be concluded that during the annual evaluation of the publications 2021 (14.07%) has attained the top position during the ten year annual evaluation.

v) Among the top 10 eminent authors, Striano P. has published the highest number of publications such as 315 (1.74%) articles followed by Zara F. 116 (0.64%) articles and Guerrini R. published 114 (0.63%) articles respectively.

7. Conclusion

Scientometrics is the branch of study which helps to find certain parameters in the field of Library and Information Science. It aims to analyzed and evaluate science, technology and innovation. Major research includes measuring the impact of the authors, publications, journals, institutes, citations, highly cited works and countries as referenced to sets of scientific publications such as articles and patents.

8. References

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