
Research Productivity of Cardiovascular System: A Bibliometric Analysis

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Abstract

This study assesses cardiovascular system research carried out in different parts of the world during 2007-2016, using different bibliometric measures. Data have been downloaded from Web of Science database for the above period. Using the keywords 'cardiovascular system' in the title and abstract fields. The study examined the pattern of growth of the output, its year wise distribution, geographical distribution and author wise distribution, etc. The Article, followed by the Review and Article proceedings are published the highest number of papers. The majority of the articles are in the language of English, followed by Russian and German.

Keywords

Bibliometric, Cardiovascular system, Web of Science, scientometrics.

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INTRODUCTION

The heart and circulatory system make up our cardiovascular system. Our heart works as a pump that pushes blood to the organs, tissues, and cells of our body. Blood delivers oxygen and nutrients to every cells and removing the carbon dioxide and waste products made by those cells. Blood is carried from our heart to the rest of our body through a complex network of arteries, arterioles, and capillaries. Blood is returned to our heart! through venules and veins. If all the vessels of this network were laid end to end, they would extended for about 60,000 miles (more than 96,500 kilometers), which is far enough to circle the planet Earth more than twice

CARDIOVASCULAR DISEASES

According to the World Health Organization (WHO), cardiovascular diseases (CVDs) are the leading cause of deaths all over the world - more people die from CVDs than anything else. In 2015, approximately 17.7 million people died from CVDs worldwide; just under one third (31 percent) of all registered premature deaths. Of these deaths, 7.4 million died from coronary heart disease and 6.7 million from stroke. The majorities (greater than 75 percent) of CVD deaths occurred in low and middle-income countries. CVDs occur equally in men and women, and 23.6 million people will die from CVDs annually by 2030 - most of the deaths being due to stroke and heart disease. More women than men die of heart disease each year. 23% of women and 18% of men will die within one year of a first recognized heart attack; 22-32% of women and 15-27% of men heart attack survivors will die within five years. 12-25% of women and 7-22% of men heart attack survivors will be diagnosed with heart failure within five years. In 2013, there were 289,758 or one in every four female deaths was from heart disease.

BIBLIOMETRIC STUDY

Bibliometric methods or analysis is the daily practice of scientific researchers shows that inspired scientists, particularly in the natural science and medical research field. The methods are used increasingly when studying various aspects of science and also in the way of institutions and universities are ranked worldwide. Alan Pritchard (1969) defined the term Bibliometrics as the application of mathematics and statistical tools to map out data of books and other media of communication. The bibliometrics has transpired as a

thrust area of research, subsuming different branches of human knowledge. There are prominent laws of Bibliometric i.e. Lotka’s Law (1926) of scientific abundance, Bradford’s Law (1934) of scattering and Zips Law (1949) on word occurrence. But the Bibliometric studies started in late sixties.

OBJECTIVE

The main objectives of the study are:

1. To find out the Year wise research output on cardiovascular system.
2. To analyses the form wise distribution of research output.
3. To identify the language wise distribution of research output.
4. To examine the country wise distribution of research output.
5. To study the authorship pattern research publication.

METHODOLOGY

The data were collected from Web of Science (WoS) database; the study period is during 2007-2016. The search string “Cardiovascular System” in the title, keyword field was used to extract publication related to cardiovascular system. A totally 8567 records downloaded and analyzed by the Microsoft Excel Office Spread sheet application.

DATA ANALYSIS AND INTERPRETATION

Table 1: Year wise distribution of publications

S. No.	Publication Year	Publications	%	TLCS	TGCS
1	2007	680	7.9	1208	25159
2	2008	718	8.4	864	20772
3	2009	735	8.6	914	19637
4	2010	743	8.7	764	20656
5	2011	831	9.7	659	14737
6	2012	832	9.7	647	15214
7	2013	928	10.8	455	11850
8	2014	964	11.3	412	8985
9	2015	1041	12.2	152	5725
10	2016	1095	12.8	38	2379
	Total	8567	100		

Table 1 exhibit that the year wise distribution of cardiovascular system research output. The study analysis the annual distribution and growth pattern of articles for the period 2007-2016, in the year 2007

the publication output is 680(7.9%) with 1208 TLCS, 25159 TGCS and it is a substantial increase in every year. Total 8567 research publications during 2007-2016 were published with an average 857 articles per year.

Table 2: Document wise distribution of Publications

S. No.	Document Type	Records	Percent	TLCS	TGCS
1	Article	5917	69.07	3389	75151
2	Review	1992	23.25	2326	62803
3	Article; Proceedings Paper	216	2.52	168	3697
4	Meeting Abstract	173	2.02	2	9
5	Editorial Material	124	1.45	48	838
6	Letter	63	0.73	130	358
7	Review; Book Chapter	53	0.62	33	1815
8	Article; Book Chapter	18	0.21	9	307
9	Correction	5	0.06	0	2
10	Article; Retracted Publication	3	0.04	8	97
11	Book Review	1	0.01	0	0
12	News Item	1	0.01	0	0
13	Reprint	1	0.01	0	37

Table 2 explains that the document type wise research performance in cardiovascular system, Articles has predominant place 5917 (69.07%) of records with 3389 TCLS, 75151 TGLS followed by, Review has 1992 (23.25%) of records with 2326 TCLS, 62803 TGLS, Article; proceeding paper has 216(2.52%) of records with 168 TCLS, 3697 TGLS, in this way very last 1(0.01%) of records with 37 TGLS published by Reprint.

Table 3: Language wise distribution of Publications

S.No.	Language	Records	Percent
1	English	8132	94.92
2	Russian	117	1.37
3	German	77	0.91
4	Polish	56	0.66
5	Portuguese	47	0.55

6	Spanish	39	0.46
7	French	35	0.41
8	Turkish	23	0.27
9	Chinese	7	0.08
10	Serbian	7	0.08
11	Japanese	5	0.05
12	Lithuanian	5	0.05
13	Italian	4	0.05
14	Slovene	4	0.05
15	Czech	2	0.02
16	Greek	2	0.02
17	Ukrainian	2	0.02
18	Croatian	1	0.01
19	Hungarian	1	0.01
20	Korean	1	0.01
	Total	8567	100

Table 3 indicates that maximum number of articles is published in English language (94.92%), followed by Russian (1.37%), German (0.91%), remaining (2.8%) of the articles are published in 17 languages like Polish, Portuguese, Spanish and French, etc.,

Table 4: Top 20 Country wise distributions of publications

S. No.	Country	Records	Percent	Cumulative records	Cumulative Percent
1	USA	1694	19.77	1694	19.77
2	Peoples R China	793	9.26	2487	29.03
3	Italy	636	7.42	3123	36.45
4	UK	630	7.35	3753	43.80
5	Germany	627	7.32	4380	51.12
6	Brazil	399	4.66	4779	55.78
7	Japan	385	4.49	5164	60.27
8	Canada	334	3.91	5498	64.18
9	France	286	3.34	5784	67.52
10	Poland	283	3.30	6047	70.82
11	Australia	228	2.66	6295	73.48
12	Turkey	206	2.40	6501	75.88
13	Netherlands	193	2.25	6694	78.13
14	Russia	167	1.95	6861	80.18
15	Spain	159	1.86	7020	81.94
16	India	101	1.18	7121	83.12
17	Switzerland	86	1.01	7207	84.13
18	South Korea	84	0.98	7291	85.17
19	Sweden	74	0.86	7365	85.97
20	Taiwan	70	0.82	7435	86.79

Table 4 indicates that maximum number of records published by USA 1694(22.78%), followed by

Peoples R China 793(9.26%), Italy 636(7.42%), etc. and the minimum number of records published by Taiwan with 70(0.82%).

Table 5: Authorship pattern

Authorship Patter	Publications	%	Cumulative	Cum%
Single Author	583	6.81	583	6.81
Double Authors	1114	13.00	1697	19.81
Three Authors	1332	15.55	3029	35.36
Four Authors	1199	14.00	4228	49.36
Five Authors	1012	11.81	5240	61.17
Six Authors	916	10.69	6156	71.86
Seven Authors	673	7.86	6829	79.72
Eight Authors	516	6.02	7345	85.74
Nine Authors	384	4.48	7729	90.22
Ten and Above Authors	838	9.78	8567	100
Total	8567	100		

Table 5 illustrates authorship pattern of cardiovascular system research, three authors were published 15.55% records with first position and second place occupies four authors with 14% and third place occupies double authors with 13%.

CONCLUSION

Bibliometric analysis is an authentic tool to evaluate the development and quality of scientific production. Conclusion from this study that, the year wise research publication shows increasing gradually during the study period. Among 8567 records, articles has paramount place with 69.07 percentage, top 20 country wise distribution, USA has placed first in position with 1694(19.77%) records, 20 languages contributed in this study, English has published 8132 records with 94.1 percentage, and three authors contributions placed first in position.

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