
Health Science Literature in Scopus Database: A Bibliographic Analysis in India

R. Kavitha

Assistant Professor,
Dept. of Library and Information Science,
Annamalai University,
Annamalai Nagar-608002, India

R. Ponnudurai

Professor,
Dept. of Library and Information Science,
Annamalai University,
Annamalai Nagar-608002, India

Abstract

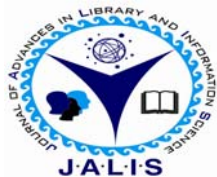
Health sciences are somewhat related to social aspect than pertaining to pure medical aspect. It is also termed as health care science. It is not to be confused with medical research. Therefore an attempt has been made to find the growth of literature in basic health sciences. For this purpose, medical online data base were not considered. Insteat Scopus database has been taken for the study. Under the search term "Health Science", irrespective of the field, the SCOPUS database provided more than one lakh records. These records were further analysed using Excel and SPSS software. This paper attempt to provide the growth of literature in the field of health sciences over a period of 43 years ie. 1970-2012.

Keywords

Health Science Literature; Scopus Database;
Bibliographic Analysis

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INTRODUCTION

Dimensional growth in health science has been witnessed during the last two decades. Majority of the development on health science literature were covered in medical database. Casual analysis has been made in the scopus database to find out any literature on health sciences. It is surprising to see there is an existence of more than one lakh publications in the scopus database during the period of 1970 to 2012(43 years). This paved way for the bibliometric study on health science and hence this paper.

HEALTH SCIENCE

Healthcare science, also known as medical science, is a set of applied sciences applying portions of natural science or formal science, or both, to develop knowledge, interventions, or technology of use in healthcare or public health. Such disciplines as medical microbiology, clinical virology, clinical epidemiology, genetic epidemiology, and biomedical engineering are medical sciences. Explaining physiological mechanisms operating in pathological processes, however, pathophysiology can be regarded as basic science. It is not to be confused with Medical research. This indicates that health sciences are somewhat related to social aspect than pertaining to pure medical aspect. There are at least 45 different specialisms within healthcare science, which are traditionally grouped into three main divisions

- Specialisms involving life sciences
- Specialisms involving physiological science
- Specialisms involving medical Physics or bioengineering

BIBLIOMETRIC STUDY

Bibliometric analysis is employed by researchers to study the growth of literature in given field. Pritchard (1969) defined the term Bibliometric as the application of statistical and mathematical methods to books and other communication. The bibliometrics has emerged as a thrust area of research, incorporating different branches of human knowledge. There are famous Laws of Bibliometric i.e. Lotka's law (1926) of scientific productivity, Bradford's law (1934) of scattering and Zips law (1949) on frequency of words. But the Bibliometric studies started in late sixties.

OBJECTIVES

Main objectives of the study are

1. To study the year wise publication of health sciences.
2. To examine the worldwide research production in health sciences.
3. To identify the document type of the publications in health sciences.
4. To identify the institution/organizations conducting the research in health sciences.
5. To highlight the top thirty journals in health sciences.
6. To compare and measure the relative growth rate and doubling time of literature published.

COLLECTION OF DATA

For this study, the literature on health sciences data has been downloaded from ‘Scopus’, multidisciplinary online database, which is an international indexing and abstracting database, using the search term “Health Science”. For this study, publications commencing from 1970-2012 (43 years) has been downloaded from the database. A total of 1,13,794 data has been identified.

The collected data has been classified by using Excel and the same was loaded in to SPSS (statistical package for social sciences) for the purpose of analysis. Statistical tools such as frequency distribution and percentage analysis and Scientometric techniques such as Relative Growth Rate (RGR), Doubling time (dt) citation analysis etc were used for the study.

DATA ANALYSIS

The year wise distribution of a total of 1,13,794 records were shown in table 1

Table 1: Year Wise Distribution of Health Science Publication

S.No.	Year	Publication	%	cumulative	%
1	1970	132	0.12	132	0.12
2	1971	138	0.12	270	0.24
3	1972	173	0.15	443	0.39
4	1973	337	0.30	780	0.69
5	1974	450	0.40	1230	1.08
6	1975	299	0.26	1529	1.34

7	1976	330	0.29	1859	1.63
8	1977	321	0.28	2180	1.92
9	1978	358	0.31	2538	2.23
10	1979	377	0.33	2915	2.56
11	1980	349	0.31	3264	2.87
12	1981	348	0.31	3612	3.17
13	1982	406	0.36	4018	3.53
14	1983	439	0.39	4457	3.92
15	1984	449	0.39	4906	4.31
16	1985	497	0.44	5403	4.75
17	1986	460	0.40	5863	5.15
18	1987	449	0.39	6312	5.55
19	1988	480	0.42	6792	5.97
20	1989	594	0.52	7386	6.49
21	1990	612	0.54	7998	7.03
22	1991	710	0.62	8708	7.65
23	1992	811	0.71	9519	8.37
24	1993	920	0.81	10439	9.17
25	1994	1005	0.88	11444	10.06
26	1995	1123	0.99	12567	11.04
27	1996	1706	1.50	14273	12.54
28	1997	1662	1.46	15935	14.00
29	1998	2084	1.83	18019	15.83
30	1999	2687	2.36	20706	18.20
31	2000	4540	3.99	25246	22.19
32	2001	5462	4.80	30708	26.99
33	2002	7333	6.44	38041	33.43
34	2003	6718	5.90	44759	39.33
35	2004	3714	3.26	48473	42.60
36	2005	5107	4.49	53580	47.09
37	2006	6039	5.31	59619	52.39
38	2007	6932	6.09	66551	58.48
39	2008	7845	6.89	74396	65.38
40	2009	8029	7.06	82425	72.43
41	2010	8881	7.80	91306	80.24
42	2011	10459	9.19	101765	89.43
43	2012	12029	10.57	113794	100.00
		113794	100.00		

It can be seen from the table 1 that the publication of health science research seems to be in parabolic

nature. During the last ten years there is a substantial increase in the publications. This indicates that the awareness and importance of health science has been in increasing trend.

Country wise distribution of health science records were shown in Table 2.

Table 2: Country Wise Distribution

S.No	Countries	No of publications	Percentage	Cumulative %
1	United States	43530	38.25	38.25
2	United Kingdom	10712	9.41	47.66
3	Canada	6730	5.91	53.57
4	Australia	4155	3.65	57.22
5	Germany	3643	3.2	60.42
6	Netherlands	2910	2.56	62.98
7	China	2730	2.4	65.38
8	Italy	2604	2.29	67.67
9	France	2532	2.23	69.9
10	India	2231	1.96	71.86
11	Sweden	2206	1.94	73.8
12	Spain	2154	1.89	75.69
13	Japan	1991	1.75	77.44
14	Brazil	1670	1.47	78.91
15	Switzerland	1573	1.38	80.29
16	South Korea	1272	1.12	81.41
17	Belgium	1182	1.04	82.45
18	Denmark	1101	0.97	83.42
19	Iran	1059	0.93	84.35
20	Norway	982	0.86	85.21
21	Finland	950	0.83	86.04
22	Taiwan	902	0.79	86.83
23	Turkey	867	0.77	87.60
24	South Africa	829	0.73	88.33
25	New Zealand	782	0.69	89.02
26	others	12497	10.98	100.00
	Total	113794	100	

It is observed from table 2 that twenty five countries were produced 89% of the total publications of health science. Among the 25 countries, USA has 38.25% of health science literature. It is followed by UK (9.41%), Canada (5.91%), Australia (3.65%), Germany (3.2%) and Netherlands (2.56%). India occupies tenth position with the contribution of 1.96. In all 71% of the total contribution of health science literature were from top ten countries.

The document wise distribution of health science records were shown in Table 3.

Table 3: Distribution of Document type

S.No.	Document Type	Number of articles	percentage
1	Article	72080	63.34
2	Review	20165	17.72
3	Conference Paper	11356	9.98
4	Editorial	2492	2.19
5	Note	2091	1.84
6	Short Survey	1907	1.68
7	Undefined	1427	1.25
8	Article in Press	924	0.81
9	Letter	831	0.73
10	Conference Review	173	0.15
11	Book Chapter	123	0.11
12	Erratum	116	0.10
13	Book	92	0.08
14	Business Article	6	0.01
15	Dissertation	6	0.01
16	Report	5	0.00
		113794	100.00

It can be seen from the table 3 that majority of the health science literature are published as journal article (63.34%). It is followed by review (17.72%), Conference Paper (9.98%) and editorial column (2.19%).

The top 25 institutions/organizations that contribute the health science literature has been identified and shown in table 4

Table4: Top 25 Affiliated Institutions/ Organizations' Publications

S.No.	Institution	No. of Records	Percentage	Cum %
1	VA Medical Center	961	0.84	0.84
2	University of Toronto	944	0.83	1.67
3	The University of North Carolina at Chapel Hill	837	0.74	2.41
4	University of California, San Francisco	821	0.72	3.13
5	University of Washington Seattle	793	0.7	3.83
6	The University of British Columbia	606	0.53	4.36
7	Harvard Medical School	572	0.5	4.86
8	University Michigan Ann Arbor	565	0.5	5.36
9	University of Pennsylvania	551	0.48	5.84
10	University of California, Los Angeles	544	0.48	6.32
11	University of Minnesota Twin Cities	542	0.48	6.8
12	Johns Hopkins Bloomberg School of Public Health	533	0.47	7.27
13	McMaster University	526	0.46	7.73
14	Centers for Disease Control and Prevention	525	0.46	8.19

15	King's College London	512	0.45	8.64
16	UCL	512	0.45	9.09
17	University of Illinois at Chicago	507	0.45	9.54
18	University of Alberta	504	0.44	9.98
19	Harvard School of Public Health	495	0.43	10.41
20	Columbia University in the City of New York	473	0.42	10.83
21	National Cancer Institute	464	0.41	11.24
22	Karolinska Institute	456	0.4	11.64
23	McGill University	450	0.4	12.04
24	Ohio State University	450	0.4	12.44
25	University of Florida	441	0.39	12.83
26	Others	99210	87.17	100
		113794	100	100

It is observed from table 4 that top 25 institutions/organizations' contributions were only 12.83%. Among the 25 top institutions/organizations VA Medical Centre (0.84%) and University of Toronto (0.83%) are in top two positions.

It seems majority of the articles in health science were appeared in the journals. Therefore it is better to identify the top 30 journals in health science. The top 30 publications were identified and the same is shown in table 5. The table further shows the percentage of contribution on total number of records and the cumulative percentage.

Table 6:- Top 30 Journals Publications

S.No	Source Title	No. of Records	%	Cum %
1	Social Science and Medicine	1591	1.4	1.4
2	Annals of the New York Academy of Sciences	852	0.75	2.15
3	Science	811	0.71	2.86
4	Maternal and Child Health Journal	787	0.69	3.55
5	Quality of Life Research	766	0.67	4.22
6	AIDS and Behavior	710	0.62	4.84
7	Journal of Manipulative and Physiological Therapeutics	642	0.56	5.4
8	Nature	641	0.56	5.96

9	Journal of Dairy Science	621	0.55	6.51
10	Journal of Community Health	619	0.54	7.05
11	Environmental Monitoring and Assessment	611	0.54	7.59
12	Journal of Immigrant and Minority Health	536	0.47	8.06
13	Community Mental Health Journal	533	0.47	8.53
14	Journal of Medical Systems	511	0.45	8.98
15	Patient Education and Counseling	507	0.45	9.43
16	Bulletin of the Medical Library Association	502	0.44	9.87
17	Scandinavian Journal of Caring Sciences	497	0.44	10.31
18	Academic Medicine	468	0.41	10.72
19	Journal of Clinical Nursing	406	0.36	11.08
20	Nutrition Reviews	386	0.34	11.42
21	Science of the Total Environment	386	0.34	11.76
22	Health Policy	375	0.33	12.09
23	Cancer Causes and Control	367	0.32	12.41
24	Preventive Medicine	366	0.32	12.73
25	International Journal of Medical Informatics	361	0.32	13.05
26	International Journal of Nursing Studies	351	0.31	13.36
27	Journal of Clinical Epidemiology	339	0.3	13.66
28	Environmental Health Perspectives	331	0.29	13.95
29	Administration and Policy in Mental Health and Mental Health Services Research	322	0.28	14.23
30	Breast Cancer Research and Treatment	322	0.28	14.51
	Others	97277	85.49	100
		113794	100	

Out of 1,13,794 records, Social Science and Medicine (1591 articles), Annals of the New York Academy of Science (852) and Science (811) journals are the major contributors in health sciences are represented in table 5. Only 14.51% of the articles were appeared in top 30 journals. However 10% of the articles were appeared in seventeen journals. It

seems no Indian journals have appeared in the top 30 journals.

The relative growth rate (RGR) and Doubling Time (Dt) has been calculated yearwise and the same is shown in Table 6 and Figure 2 & 3

Table 6 : RGR and Doubling time

S.No.	Year	Publication	%	w1	w2	RGR	Dt
1	1970	132	0.12		4.882802	4.882802	0.141927
2	1971	138	0.12	4.882802	4.927254	0.044452	15.58993
3	1972	173	0.15	4.927254	5.153292	0.226038	3.065857
4	1973	337	0.3	5.153292	5.820083	0.666791	1.039306
5	1974	450	0.4	5.820083	6.109248	0.289165	2.396558
6	1975	299	0.26	6.109248	5.700444	-0.4088	-1.69519
7	1976	330	0.29	5.700444	5.799093	0.098649	7.024901
8	1977	321	0.28	5.799093	5.771441	-0.02765	-25.0619
9	1978	358	0.31	5.771441	5.880533	0.109092	6.352444
10	1979	377	0.33	5.880533	5.932245	0.051712	13.40109
11	1980	349	0.31	5.932245	5.855072	-0.07717	-8.97979
12	1981	348	0.31	5.855072	5.852202	-0.00287	-241.51
13	1982	406	0.36	5.852202	6.006353	0.154151	4.495601

14	1983	439	0.39	6.006353	6.084499	0.078146	8.867988
15	1984	449	0.39	6.084499	6.107023	0.022523	30.7679
16	1985	497	0.44	6.107023	6.20859	0.101567	6.823073
17	1986	460	0.4	6.20859	6.131226	-0.07736	-8.95771
18	1987	449	0.39	6.131226	6.107023	-0.0242	-28.6321
19	1988	480	0.42	6.107023	6.173786	0.066763	10.37997
20	1989	594	0.52	6.173786	6.386879	0.213093	3.252098
21	1990	612	0.54	6.386879	6.416732	0.029853	23.21378
22	1991	710	0.62	6.416732	6.565265	0.148533	4.66564
23	1992	811	0.71	6.565265	6.698268	0.133003	5.210405
24	1993	920	0.81	6.698268	6.824374	0.126106	5.495394
25	1994	1005	0.88	6.824374	6.912743	0.088369	7.842103
26	1995	1123	0.99	6.912743	7.023759	0.111016	6.242336
27	1996	1706	1.5	7.023759	7.441907	0.418148	1.657309
28	1997	1662	1.46	7.441907	7.415777	-0.02613	-26.5215
29	1998	2084	1.83	7.415777	7.642044	0.226267	3.062748
30	1999	2687	2.36	7.642044	7.896181	0.254136	2.726884
31	2000	4540	3.99	7.896181	8.420682	0.524502	1.321254
32	2001	5462	4.8	8.420682	8.60557	0.184888	3.748215
33	2002	7333	6.44	8.60557	8.90014	0.29457	2.352584
34	2003	6718	5.9	8.90014	8.812546	-0.08759	-7.91148
35	2004	3714	3.26	8.812546	8.219865	-0.59268	-1.16926
36	2005	5107	4.49	8.219865	8.538367	0.318503	2.175806
37	2006	6039	5.31	8.538367	8.705994	0.167626	4.134196
38	2007	6932	6.09	8.705994	8.843904	0.13791	5.025019
39	2008	7845	6.89	8.843904	8.967632	0.123728	5.600995
40	2009	8029	7.06	8.967632	8.990815	0.023184	29.89182
41	2010	8881	7.8	8.990815	9.091669	0.100854	6.871307
42	2011	10459	9.19	9.091669	9.255218	0.163549	4.23727
43	2012	12029	10.57	9.255218	9.395076	0.139858	4.955042

The graph shows the relative growth rate is linear in nature. There exist of negative growth. Similarly the doubling time also shows linear trend and few exceptions

FINDINGS

Some of the findings are

- The publication of health science research seems to be in parabolic nature. During the last ten years there is a substantial increase in the publications. This indicates that the awareness and importance of health science has been in increasing trend.
- Twenty five countries were producing 89% of the total publications of health science.
- Among the 25 countries, USA has 38.25% of health science literature. It is followed by UK (9.41%), Canada (5.91%), Australia (3.65%), Germany (3.2%) and Netherlands (2.56%).
- India occupies tenth position with the contribution of 1.96 percentage.
- In all 71% of the total contribution of health science literatures were from top ten countries.
- It can be seen from the table that majority of the health science literature are published as journal article (63.34%). It is followed by review (17.72%), Conference Paper (9.98%) and editorial column (2.19%).
- The top 25 institutions contributions were only 12.83%. Among the 25 top institutions/organizations VA Medical Centre and University of Toronto are in the top two positions. No Indian institutions find place in the top 25 institutions.
- Social Science and Medicine (1591 articles), Annals of the New York Academy of Science (852) and Science (811) journals are the major contributors in health sciences. Only 14.51% of the articles were appeared in top 30 journals. However 10% of the articles were appeared in

seventeen journals. It seems no indian journal has appeared in the top 30 journals.

- The graph shows the relative growth rate is linear in nature. Their exist negative growth.
- The doubling time also shows linear trend and few exceptions

CONCLUSION

In this study a preliminary literature outcome on basic health sciences were provided. The recent rise of interest among the health science education community in individual faculty making subjective judgments about medical trainee performance appears to be directly related to the introduction of notions of integrated competency-based education and assessment for learning. Although it is known that assessor expertise plays an important role in performance assessment, the roles played by different factors remain to be unraveled. It is therefore essential fo conducted an exploratory study with the aim of building a preliminary model to gain a better understanding of expertise of health science literature.

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