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CITATION ANALYSIS OF MEDICAL DISSERTATIONS AT THE MAMATA MEDICAL COLLEGE, KHAMMAM, TELANGANA

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ABSTRACT

Citation analysis is a practical tool to assess the concept that how a library is meeting the needs of the local users. Citation analysis of doctoral theses and dissertations plays an important role in analyzing the use of journals to understand the user's need. The study analysed the citations of dissertations related to MD degree submitted at the Mamata Medical College, Khammam, Telangana, during the period from 2006 to 2014. Total 4288 citations were appended from 51 dissertations. Journals contribute the highest number of citations accounting for 87.90% of total citations. Multi authored contributions accounting for 77.77% of total journal article citations. The journal entitled '*Circulation*' published from Philadelphia occupies the first rank as the most preferred journal having been cited 211 times. The maximum number of citations 1372 (32.65%) are covered during the period of 1991-2000, followed by the1328 (31.60%) of citations in the 2001-2010. The present study is the degree of collaboration C (journals) =0.78 and C (Books) = 0.49.

Key words: Citation analysis, Bibliometrics, General Medicine

1. INTRODUCTION

At present librarians are facing multiple problems due to the rising of subscription rates of journals every year, ever increasing demand of the reading group of people for getting new journals and limited allocation of budgetary provisions to meet the user requirements. It is becoming necessary for them to identify core periodicals and to determine collection development polices in different disciplines in order to procure useful periodicals and other collections within the given financial resources for providing effective service to the users in the library.

Citation analysis, which is one of the areas of bibliometrics, which can be used for identifying the core periodicals and for familiarising the characteristic features of the discipline such as authorship pattern, scatter of literature in different bibliographic forms and in different subjects, etc. It is also a technique that gives potentially valuable information in the management of library journal collection. It helps to identify the quality of the information sources. Gross and Gross used for the first time this citation analysis as a tool for identifying the core periodicals in a subject based on counting the citations given at the end of each article from a group

of primary periodicals. Subsequently a number of such studies were carried out on citations in dissertations/theses, books, primary journals and reviewing journals.

2. Literature review

A review of related literature reveals that much number of studies have been carried out on bibliometrics and citation analysis on various disciplines including science, engineering, medicine etc. lerature.

Jail (2014) studied citation analysis of Oral Pathology and Microbiology postgraduate dissertations submitted to Rajiv Gandhi University of Health Sciences, Bengaluru. In this study authored opined that journals are most prerogative resources, followed by books and electronic resources. Reports and Newsletters are less referred form of citation, dissertations and conference proceedings are the least used sources.

Kiran and Deepika (2014) studied the citation analysis of theses submitted at the Gastroenterology department of the postgraduate institute of Medical Education and Research, Chandigarh, during the period of 2000 - 2010. This stated that journals were the most cited information sources, followed by books, reports, conference/workshops, websites and so on.

Manivannan and Sanjeevi (2012) opined that the bibliometric analysis of the Indian Journal of Medical Research for the period of five years between 2000 and 2005. This study highlighted that the journal articles are occupied prominant position followed by books, reports and case studies and more number of articles contributed by three authors compared to others. The educational institutions' publications are more compared to research centre.

Olatokun and Mankinde (2009) stated that the citations analysis of dissertations submitted to the department of Animal Science, University of Ibadan, Nigeria during the period 2000 to 2007. The results of this study is that the journals were the most utilized reference materials in the dissertations when compared to other reference materials.

Tirgar, Abolghasemi and Yaminfirooz (2013) have opined that the citation analysis of graduate dental thesis references- before and after an intervention submitted at Babol University of Medical Sciences during 2007-2010. The analysis of 111 theses and 5334 citations exhibited that the journals were the most frequent format (80%) compared to other formats.

3. Objectives

The objectives of the present study are:

- To know the distribution of citations in different bibliographic forms;
- To examine the authorship pattern of books and journals;
- To examine the average number of citations per dissertation;
- To find out the range of publication dates; and
- To identify the core periodicals.

4. Materials and methods

The data for the present study was collected from M.D (Doctor of Medicine) dissertations in General Medicine. These dissertations were submitted to Mamata Medical College, Khammam, Telangana during the years 2006-2014. There are 4288 citations in theses dissertations. The average number of citations per dissertation is nearly 84. All these citations were entered in Microsoft Excel as they are cited in the dissertations. They are analysed according to the objectives as stated above.

5. Tools used

The collected data were tabulated in the MS-Office Excel sheet and used the simple statistics and percentage analyses are used. The extent of collaboration in research has been measured with the help of authorship pattern of papers. The following formula stipulated by Subramanyam (1983) is used for measuring collaboration.

$$C = \frac{NM}{NM + NS}$$

Where C = extent of collaboration in a discipline
NM = Number of multiple authored papers
NS = Number of single authored papers.

6. Result and discussion

6.1 Year wise distribution of submission of dissertations

The distribution of submission of dissertations according to the year wise is shown in Table 1.

Table1: Year wise distribution of dissertations

S.No	Year	Number of dissertations	Percentage
1	2006	4	7.85
2	2007	6	11.76
3	2008	2	3.93
4	2009	4	7.85
5	2010	6	11.76
6	2011	6	11.76
7	2012	6	11.76
8	2013	6	11.76
9	2014	11	21.57
	TOTAL	**51**	**100.00**

It is evident from Table 1 that the total number of dissertations according to the year of their submission. A maximum number of 11 dissertations were submitted in the year 2014, followed by 6 each in the years, 2007, 2010, 2011, 2012 and 2013, 4 each in the years 2006 and 2009 and 2 dissertations in the year 2008.

6.2 Average number of citations per dissertation

The distribution of dissertations according to the number of citations and average number of citations per dissertation is shown in Table 2.

Table 2: Number of citations and average citations per dissertation

S.No	Year	Total dissertations	Total citations	Average citations per dissertation
1	2006	4	329	82.25
2	2007	6	310	51.67
3	2008	2	214	107
4	2009	4	337	84.25
5	2010	6	750	125
6	2011	6	417	69.50
7	2012	6	454	75.67
8	2013	6	651	108.5
9	2014	11	826	75.09
	TOTAL	**51**	**4288**	**84.08**

It is evident from Table 2 data regarding the average number of citations per dissertation. It is observed from the study that on an average 84.08 citations were cited per dissertation by the General Medicine doctors. Further it is observed from the table that the highest number of citations per dissertation is 125 were found in the year 2010.

6.3 Bibliographic forms

The distribution of citations according to the different types of bibliographic forms is shown in Table 3.

Table 3: Distribution of citations according to the bibliographic forms

S. No	Bibliographic form	Citations	Cumulative Citations	Percentage	Cumulative Percentage
1	Books	433	433	10.10	10.10
2	Journals	3769	4202	87.90	98.00
3	Reports	59	4261	1.37	99.37
4	Theses/ Dissertations	12	4273	0.28	99.65
5	Websites	15	**4288**	0.35	**100.00**

It is evident from Table 3 that the distribution of different bibliographic forms of citations in the field of General Medicine. It is observed from the table that the journal contributes the highest number of citations accounting for 87.90 percentages of the total citations. This indicates that the journals are the most preferred source of information by the General Medicine doctors. Books are the second most cited source accounting for 10.10 percentages of the total citations. In other words journals and books together contribute 98 percentages of the total number of citations cited by the doctors in General Medicine.

6.4 Authorship pattern of books and journals

The distribution of citations of books and journals in general medicine according to the number of authors is shown in Table 4.

Table 4: Authorship pattern of books and journal citations

S. No	Number of authors	Citations	Cumulative Citations	Percentage	Cumulative Percentage
1	Single	938	938	22.32	22.32
2	Double	1169	2107	27.82	50.14
3	Three	688	2795	16.37	66.51
4	More than three	1407	**4202**	33.49	**100.00**

It is evident from Table 4 that out of the 4202 books and journals citations, 1407 (33.49%) articles were contributed by more than authors, 1169 (27.82%) by double authors, 938 (22.32%) by single authors and 688 (16.37%) by three authors. It can be concluded that majority of the books and journal articles contributed by multiple authors in General Medicine.

6.5 Authorship pattern of journals

The distribution of citations of journals in general medicine according to the number of authors is shown in Table 5.

Table 5: Authorship pattern of journal articles

S. No	Number of authors	Citations	Cumulative Citations	Percentage	Cumulative Percentage
1	Single	838	838	22.23	22.23
2	Double	1069	1907	28.36	50.59
3	Three	555	2462	14.73	65.32
4	More than three	1307	**3769**	34.68	**100.00**

Table 5 clearly shows that authorship pattern of journal citations indicates that out of total number of 3769 citations, 1307 (34.68%) are by more than three authors, 1069 ((28.36%) double authors, 838 (22.23%) single authors and the remaining 555 (14.73%) are by three authors. Hence, it can be inferred from the data that most of the authors in General Medicine are writing the journal articles with collaboration.

6.6 Authorship pattern of books

The distribution of citations books in general medicine according to the number of authors is shown in Table 6.

Table 6: Authorship pattern of books

S. No	Number of authors	Citations	Cumulative Citations	Percentage	Cumulative Percentage
1	Single	221	221	51.04	51.04
2	Double	125	346	28.87	79.91
3	Three	58	404	13.39	93.30
4	More than three	29	**433**	6.70	**100.00**

It is evident from Table 6 that out of the 433 book citations, 221 (51.04%) books were contributed by single authors, 125 (28.87%) by double authors, 58 (13.39%) by three authors and 29 (6.70%) by more than three authors. Hence, it can be inferred from the data that most of the authors in Medicine are writing books individually without any collaboration.

6.7 Single Authored Vs Multi Authored and Degree of Collaboration

The distribution of books and journal article citations by general medicine doctors according to single authored Vs multi authored and degree of collaboration is shown in Table 7.

Table 7: Distribution of citations according to single authored Vs multi authored

Source	With Single Author		With Multi Author		Total Citations	Degree of Collaboration
	No. of Citations	%	No. of Citations	%		
Books and Journals	938	22.32	3264	77.68	4202	0.78
Journals	838	22.23	2931	77.77	3769	0.78
Books	221	51.04	212	48.96	433	0.49

It is evident from Table 7 that the highest number of citations in Medicine in the category of multi authors are contributed in journal articles while in the category of single authors are contributed in book citations. The overall multi authored contributions are more than with the single authored contributions.

Collaborative research is the common phenomenon in the field of science, engineering and medicine. By analyzing the table 7 it is observed that majority of the cited journals articles were by multiple authors that means collaborative research and books were by single authors that means books are written by individually without any collaboration. The present study the degree of collaboration C (journals) =0.78 and C (Books) = 0.49.

6.8 Chronological distribution of books and journal citations

The distribution of books and journals citations according to the chronological order is shown in Table 8.

Table 8: Chronological distribution of books and journals citations

S. No	Period	Citations	Cumulative Citations	Percentage	Cumulative Percentage
1	Before 1950	93	93	2.21	2.21
2	1951 -1960	57	150	1.36	3.57
3	1961 - 1970	143	293	3.40	6.97
4	1971 - 1980	334	627	7.95	14.92
4	1981 – 1990	844	1471	20.09	35.01
5	1991 – 2000	1372	2843	32.65	67.66
6	2001 – 2010	1328	4171	31.60	99.26
7	After 2010	31	**4202**	0.74	**100.00**

It is evident from Table 8 that the maximum number of citations of books and journals 1372 (32.65%) are covered during the period of 1991-2000, followed by the period 2001-2010 accounting for 1328 (31.60%). It clearly shows the recent information is essential for the Doctors.

6.9 Rank List of cited journals

The rank list of most frequently cited journals in general medicine is shown in Table 9.

Table 9: Rank list of most frequently cited journals

S. No	Rank	Name of the Journal	Citations		Cumulative	
			No	%	No	%
1	1	Circulation	211	5.60	211	5.60
2	2	New England Journal of Medicine	210	5.57	421	11.17
3	3	Lancet	140	3.71	561	14.88
4	4	Journal of American College of Cardiology	131	3.48	692	18.36
5	5	Stroke	126	3.34	818	21.70
6	6	Journal American Medical Association	115	3.05	933	24.75
7	7	British Medical Journal	86	2.28	1019	27.04
8	8	Diabetes Care	85	2.26	1104	29.29
9	9	Journal of Association of Physician of India	74	1.96	1178	31.25
10	10	American Journal of Cardiology	73	1.94	1251	33.19
11	11	American Heart Journal	62	1.64	1313	34.84
12	12	Annals of Internal Medicine	55	1.46	1368	36.30
13	13	Archives of Internal Medicine	55	1.46	1423	37.76
14	14	American Journal of Medicine	49	1.30	1472	39.06
15	15	European Heart Journal	46	1.22	1518	40.28
16	16	Diabetologia	46	1.22	1564	41.50
17	17	Transactions of the Royal Society of Tropical Medicine and Hygiene	44	1.17	1608	42.66
18	18	American Journal of Tropical Medical Hygiene	36	0.96	1644	43.62
19	19	Journal clinical Investigation	35	0.93	1679	44.55
20	20	Kidney International	35	0.93	1714	45.48
21	21	Diabetes Medicine	33	0.88	1747	46.35
22	22	Diabetes	31	0.82	1778	47.17
23	23	Journal of Human Hypertension	29	0.77	1807	47.94
24	24	Chest	27	0.72	1834	48.66
25	25	Hypertension	25	0.66	1859	49.32
26	26	Clinical Chemistry	24	0.64	1883	49.96
27	27	Medical up date	21	0.56	1904	50.52
28	28	Arteriosclerosis, Thrombosis, and Vascular Biology	20	0.53	1924	51.05
29	29	Blood	19	0.50	1943	51.55
30	30	Quarterly Journal of Medicine	19	0.50	1962	52.06
31	31	Gastroenterology	18	0.48	1980	52.53
32	32	Indian Heart Journal	18	0.48	1998	53.01
33	33	British Heart Journal	15	0.40	2013	53.41
34	34	Journal of American Society Echo Cardiology	14	0.37	2027	53.78
42	35	8 periodicals with 13 Citations	104	2.76	2131	56.54
45	36	3 periodicals with 12 Citations	36	0.96	2167	57.50

47	37	5 periodicals with 10 Citations	50	1.33	2217	58.82
53	38	6 periodicals with 9 Citations	54	1.43	2271	60.25
63	39	10 periodicals with 8 Citations	80	2.12	2351	62.38
74	40	11 periodicals with 7 Citations	77	2.04	2428	64.42
85	41	11 periodicals with 6 Citations	66	1.75	2494	66.17
107	42	22 periodicals with 5 Citations	110	2.92	2604	69.09
130	43	23 periodicals with 4 Citations	92	2.44	2696	71.53
196	44	66 periodicals with 3 Citations	198	5.25	2894	76.78
316	45	120 periodicals with 2 Citations	240	6.37	3134	83.15
951	46	635 periodicals with 1 citation	635	16.85	3769	100.00

It is evident from Table 9 that there are 951 journals arranged in order to their ranks. The journal entitled '***Circulation***' published from Philadelphia occupies the first rank as the most preferred journal having been cited 211 times. New England Journal of Medicine published from (USA) is scores the second highest with 210 times, it is followed by Lancet (UK) 140 times, Journal of American College of Cardiology (USA) 131 times, and Stroke (USA) 126 times and it's got third, fourth and fifth ranks respectively. It is also evident from it that the first five journals in the ranking list together accounts for 21.70% of the total citations and the first 30 journals out 951 total ranked journals cover 52.06% of citations, while the remaining 921 journals together account for 47.94% of citations.

7. Conclusions

An analysis of 4288 citations appended from 51 MD dissertations in general medicine reveals the following conclusions:

- Journals appear to be the most preferred source of information for doctors in general medicine since they contributed the highest number of citations (87.90%).
- The average citations per dissertation are 84.
- Most of the authors in General Medicine (77.77%) are writing the articles for the journals with collaboration and the degree of collaboration is C = 0.78.
- Most of the authors in general medicine (51.04%) are writing the books individually without any collaboration and the degree of collaboration is C = 0.49.
- Out of 4202 citations of books and journals, the maximum number of citations 1372 (32.65%) are covered during the period of 1991-2000, followed by 1328 (31.60%) during 2001-2010.
- The journal entitled '***Circulation***' published from Philadelphia occupies the first rank as most of the preferred this journal having been cited 211 times. New England Journal of Medicine published from USA scores the second highest with 210 times, it is followed by Lancet from UK with 140 citations, Journal of American College of Cardiology from USA with 131 citations, and Stroke from USA with 126 citations and they got third, fourth and fifth ranks respectively.

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