

A Scientometric Study of the “Journal of Postgraduate Medicine”

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Abstract - The subject of this paper is the Scientometric analysis of 601 articles printed in “Journal of Postgraduate Medicine” from 2013 to 2017. The study focuses on numerous aspects of the journal like the year wise distribution of articles, annual rate of growth, authorship pattern, authorship productivity, degree of collaboration, and collaborative index. The maximum number of 153(25.5%) papers were published in 2017 and the minimum of 98(16.3%) in 2013. The study shows that the maximum of 201(33.4%) out of 601 articles are contributed by more than four authors and the single author contribution constitute the minimum number 95(15.5%). It is analyzed that minimum AAPP as 2.12 with maximum productivity per author is 0.47 in the year 2017 and maximum AAPP as 6.25 with minimum productivity per author is 0.15 within the year 2013. Overall the average degree of collaboration was 0.84, and the average collaborative index was 3.6. The range of AGR is between (31.9%) and (56.1%). This study might facilitate people who would like to map the scientometric patterns of journals or establishments or individual.

Keywords: Scientometric analysis, Authorship pattern, Degree of collaboration, Collaborative index.

I. INTRODUCTION

Scientometrics is a branch of the science, ‘Science of Science’. Haitun treats Scientometrics, as a scientific discipline, that performs reproducible measurements of scientific activity. Now-a-days, scientometrics is one among the actual knowledge domain analysis field extended to the majority scientific fields. For the purpose of conducting this study, the “Journal of Postgraduate Medicine” has been taken into consideration. During this study, the authors have mentioned, analysed, and calculated different scientometric aspects by using scientometric tools like the degree of collaboration, collaborative index and average author per paper.

A. The objectives of the Study are the Following

1. To access year wise distribution of articles.
2. To search the annual rate growth analysis of articles.
3. To determine the authorship pattern of the papers.
4. To work out the degree of collaboration.
5. To analyse collaborative index of the journal.
6. To calculate author productivity per paper.

B. Source Journal

Journal of Postgraduate Medicine a multi disciplinary Quarterly biomedical journal, is one of the oldest medical

journals from India. The journal is an official publication of the workers Society of Seth G. S. Medical College and K. E. M. Hospital, Mumbai, India. The journal is printed, managed and funded by MEDKNOW Publications, Mumbai, India.

The Journal promotes printed papers by electronically providing the records to the National Library of Medicine at the time of the online publication, ensuring that the citations are recoverable from MEDLINE as early as attainable. Similarly, the citations in MEDLINE are cross linked from the official website of MEDLINE to the journal's site, therefore the audience of the printed articles has increased several folds. Full text content of the journal is also available from Bioline International, Canada (www.bioline.org.br/jp).

II. REVIEW OF LITERATURE

Madhu Bala and Dr. Mahender Pratap Singh have studied and critically analyzed 316 scholarly communications printed in the ‘Indian Journal of Biochemistry & Biophysics’. The analysis cover mainly the number of articles, a variety of documents cited, most cited Journals. The Study reveals that single author contributed 18 (5.7%) articles whereas the rest of 162 (51.3%) articles were contributed by multi authors. The contributions to this Journal from India are slightly higher than that of the other countries. The objectives of this study is to help the gathering development so as to satisfy the needs of scientists and research scholars within the field of science and technology.

Dr. P. RAJENDRAN *et al*, Scientometric analysis, of 633 research articles printed in ‘Journal of Scientific and Industrial analysis’ has been taken as reference, too. Five volumes of the journal containing 60 issues from 2005 – 2009 are taken for the present study. The amount of contributions, authorship pattern & author productivity, average citations, average length of articles, average keywords and collaborative papers have been analyzed. Out of 633 contributions, 51 are single authored and rest multi authored with degree of collaboration among the authors. Pattern of Co-Authorship unconcealed the uptrend of co-authored papers. The study unconcealed that the author productivity is 0.34 and dominated by the Indian authors.

III. METHODOLOGY

The article has been taken from the website of the "Journal of postgraduate medicine" indexed in PubMed Database. This information has been collected, organized, analysed and calculated using Microsoft Excel software. Additional scientometrics equipment and techniques have facilitated the generation of tables, charts and graphs for the final study

A. Year wise contribution of single and Multiauthors

Table I shows year wise contribution of single and multi authors. In 2017, there was a 153(25%) maximum number of single author contribution. out of 611 total contributions, i.e., maximum author contribution during this research period. In 2013, there was a minimum number of total contributions 326 and maximum number of single author contribution, 98(30%). During this research period (2013-2017) solely 601(26.4%) articles were printed with single authorship out of 2290 total number of authors.

TABLE I YEAR WISE CONTRIBUTION OF SINGLE AND MULTIAUTHORS

Year	Single	Double	Triple	Four	Above four	
2017	153(25%)	136	108	85	129	611(26.7)
2016	116(24.3)	102	83	58	119	478(21)
2015	110(25.4)	91	79	52	103	435(19)
2014	124(28.2)	103	70	58	85	440(19)
2013	98(30%)	74	58	41	55	326(14.2)
	601(26.4%)	506	398	294	491	2290

Table I provides chronological distribution of publications of the study span. 601 publications were printed throughout during the period 2013-2017, the maximum number of 153(25%) papers was published in 2017 with single author contribution. Out of 611 total author contribution followed by 2016, 116(24.3%) with 478 total authorship, 2015 110 (25.4%) with 435 total authorship and 2014, 124 (28.2%) respectively with 440 total authorship. The minimum number of 98 (16.3%) papers was published with single author contribution out of 326 total authorship in 2013.

TABLE II YEAR WISE DISTRIBUTION OF ARTICLES

Year	Total no of articles	%age of articles	Cumulative percentage	AGR
2013	98	16.3	16.3	56.1
2014	124	20.6	36.9	23.4
2015	110	18.3	55.2	39.9
2016	116	19.3	74.5	31.9
2017	153	25.5	100	0
Total	601	100		

Table II Annual Growth Rate of Research Articles Annual¹ growth rate (AGR) is the change in the value of a measurement over the period of a year. To calculate AGR, the below mentioned formula is used.

$$\text{AGR} = \frac{\text{End value} - \text{First value}}{\text{First value}} * 100$$

Table II also provides a complete scenario of AGR from the year 2013 to 2017. It is observed that the highest percent of AGR (56.1%) is in the year 2013 followed by (39.9%) in 2015 and (31.9%) in the year 2016. AGR attained the lowest per cent (23.4%) in the year 2014. The range of AGR during the study span is between 31.9% and 56.1%. Cumulative growth also increased from 2013- 2017 gradually.

TABLE III TYPES OF ARTICLE

Article type	No of articles
Case reports	41(6.8%)
Clinical study	69(11.8%)
Comparative study	31(51.6%)
Journal article	447(74.4%)
Anonymous	13(2.2%)
Total	601

Table III reveals the different type of articles published during this research period maximum no of journal articles 447 (74.4%) followed by the other types such as clinical study 69 (11.8%), case reports 41 (6.8%), comparative study 31 (51.6%) and anonymous articles 13 (2.2%).

TABLE IV AUTHORSHIP PATTERN

Pattern	Total contributions	%age
Single	95	15.8
Double	107	17.8
Triple	105	17.5
Four	93	15.5
Above four	201	33.4
	601	100

Authorship Pattern Table IV shows¹ the whole authorship pattern. Out of the 601 article contributions, 95 (15.8%) has been contributed by single authors followed by 107 (17.8%) by double authors, 105 (17.5%) by triple authors and merely 93 (15.5%) by four authors. 201 (33.4%) articles are contributed by more than four authors. It is noted that more than 30% articles were authored by more than four authors and the least number, 93 (15.5%) by four authors.

TABLE V AUTHOR PRODUCTIVITY

Year	Total articles	Author	AAPP*	Productivity per author
2013	98	613	6.25	0.15
2014	124	478	3.85	0.25
2015	110	434	3.94	0.25
2016	116	440	3.79	0.26
2017	153	325	2.12	0.47

Author Productivity Table V shows¹ a true image of average author per paper (AAPP) and productivity per author within the stipulated time span. The AAPP and productivity per author is calculated by using the following formula.

$$AAPP = \frac{\text{Number of authors}}{\text{Number of papers}}$$

$$\text{Productivity per author} = \frac{\text{Number of papers}}{\text{Number of authors}}$$

Here, it is found that the minimum AAPP 2.12 with maximum productivity per author is 0.47 in the year 2017. On the other hand, maximum AAPP at 6.25 with minimum productivity per author at 0.15 could be observed during the year 2013.

TABLE VI COLLABORATIVE INDEX OF ARTICLES

Year	Multi authored papers	Total authors of multi authored papers	CI
2013	74	460	6.21
2014	103	362	3.51
2015	91	324	3.56
2016	102	316	3.09
2017	136	227	1.67
		Total	3.6

A. Collaboration Index (CI)

It³ is a mean number of authors per joint paper. For this analysis, the authors have omitted the single authored paper that is adequate 1 continually. To work out the mean number of authors per joint authored paper, the subsequent formula is used.

$$CI = \frac{\text{Total Authors}}{\text{Total Joint Papers}}$$

It is determined from Table 6 that there was maximum CI 6.21 within the year 2013 and a minimum CI 1.67 in 2017. There were 3.6 average collaborative indexes throughout the stipulated study span.

B. Degree of collaboration

The degree of collaboration is defined as the ratio of the number of collaborative research papers to the total number of research papers in the discipline during a given period of time. It is calculated by Subramanyam⁴ formula

$$C = \frac{Nm}{Nm + Ns}$$

where C is the degree of collaboration in discipline, Nm is the number of multi-authored papers in the discipline published during a year, and Ns is the number of single authored papers in the discipline published during a year

TABLE VII DEGREE OF COLLABORATION

Year	Single authored papers (NS)	Multi authored papers (NM)	DC
2013	24	74	0.75
2014	21	103	0.83
2015	19	91	0.83
2016	14	102	0.88
2017	16	137	0.86

NS= No. of single authored papers, NM= No. of multi-authored papers, DC= Degree of collaboration

Table VII reveals that the highest value of DC 0.86 is observed in the year 2017 and the lowest value of 0.75 in the year 2013. There has been a gradual increase within the degree of collaboration, and also the overall value of DC was 0.84 during the study period

IV. CONCLUSION

‘Journal of Postgraduate medicine’ has printed 601 research articles during the year 2013 to 2017. In 2017 there was 153(25%) articles were published minimum number of single author contribution out of a maximum number of 611 total contributions and this is maximum author contribution and in 2013 there was a minimum number of total author contributions 325 and maximum number of single author contribution 98(30%). Out of 601 publications were printed throughout during the period 2013-2017, the maximum number of 153(25%) papers were published in 2017 with single author contribution out of 611 total author contribution followed by 2016 116(24.3%) with 478 total authorship, 2015 110 (25.4%) with 435 total authorship and 2014 124 (28.2%) respectively with 440 total authorship. The minimum number of 98 (16.3%) papers were published with single author contribution out of 326 total authorship in 2013. It is determined that the AGR (56.1%) the highest is noticed in the year 2013 followed by (39.9%) in 2015 and (31.9%) within the year 2016. The lowest AGR (23.4%) is noticed in the year 2014. The range of AGR during the study span is between (31.9%) and (56.1%). During this period the maximum number contributions were made by journal articles 447(74.4%), followed by clinical study 69 (11.8%), casereports 41(6.8%), comparative study 31(51.6%) and anonymous articles solely 13(2.2%). Out of 601 contributions, 95(15.8 %) were contributed by single authors followed by 107(17.8%) by double authors, 105(17.5%) by triple authors and merely 93(15.5%) by four authors and 201(33.4%) by more than four authors. It is noted that more than 30% articles were authored by more than four authors and 93(15.5%) by four authors. Here it is found that the minimum AAPP 2.12 with maximum productivity per author is 0.47 in the year 2017. On the other hand, the maximum AAPP 6.25 with minimum productivity per author as 0.15 is observed in the year 2013. There was a maximum CI 6.21 in the year 2013 and

minimum CI 1.67 in 2017. There were 3.6 average collaborative indexes during the stipulated study span. The highest value of DC 0.86 is observed in the year 2017 and the lowest value of 0.75 in the year 2013. There has been a gradual increase within the degree of collaboration, and also the overall value of DC was 0.84 during the study period.

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