

Bibliometric Analysis of Physical Therapy Journal During 2011–2015

*Minaxi A.P.**

Central University of Gujarat, Gandhi Nagar, Gujarat, India

Abstract

This is a research study on the Physical Therapy Journal of the American Physical Therapy Association from the year of 2011 to 2015. The study reveals that PTJ maximum research works on the medical science field were collaborative. The Physical Therapy Journal of American Physiotherapy Association has endowed with various categories of research papers i.e. LEAP, Case Study, Technical Report, etc. to the research scholars, professionals, educationalists, etc. Here, researcher would try to classify the total number of articles between 2011 and 2015 and classify them according their respective core subject and category of article.

Keywords: PTJ, category of articles, APTA, LEAP

***Author for Correspondence** E-mail: researchapastyle@gmail.com

INTRODUCTION

According to the book “Research Methodology”, the bibliometric means a quantitative method for analyzing various aspects i.e. authors’ maturity in written field, various categories of articles, various discipliners and interdisciplinary subjects, etc. of written documents. Its origin can be traced back to the efforts of early century documentalists to apply mathematical and statistical analysis to bibliographical unit.

There are three laws of this analysis, i.e., Bradford’s Law, Zipf’s Law and Lotka’s Law. Their main pedestals are as under:

- Number of authors in a discipline or other field.
- Ranking of word frequency in a particular set of document.
- Distribution of periodical publication in a defined area of knowledge or number of papers in a set of PTJ journal.

The PTJ is leading international journal for research in physical therapy and related fields. It publishes innovative and highly relevant content for clinicians, scientists, students of bachelor and master level of physiotherapy, and orthopedic doctors also. Uses of PTJ are, like in variety of interactive approaches to communicate that content with the expressed purpose of improving patient care.

HISTORICAL BACKGROUND OF PTJ

The founder of Physical Therapy Journal is American Physical Therapy Association, which was then called The American Women’s Physical Therapeutic Association. The association was established by the legend of Mary McMillan. The journal PTJ was started in 1921–1926 with name of “Physical Therapy Review”. Mary McMillan was the president of association when the first issue of this journal was published. Other information of the journal is as under.

Year	Scenarios
1921–1926:	The name of Journal is Physical Therapy Review
1926–1948:	The Physiotherapy Review
1948–1961:	Physical Therapy Review
1962–1963:	Journal of the American Physical Therapy Association
1964–2016:	Physical Therapy
First Issue:	March 1921, Volume-1, Issue-1
First Editor in chief:	Isobel H. Nobel
Publisher:	American Physical Therapy Association
Current Location:	Alexandria, Va
Full text Article website:	http://ptjournal.apta.org/content/92/4/493 [1]
In 2012:	First bibliometric analysis during 1945–2010
2011:	Bibliometric analysis during 1980–2009.

Composition of the PTJ

The composition pattern of PTJ is as under:

- Title page of PTJ would include publication year, month, volume number, issue number and index.
- Content in PTJ is classified under various headings, i.e., Research Reports, Case Report, Technical Report, Perspective, Protocol, Clinical Guidance Statement, Profession Watch, Linking Evidence and Practice (LEAP), Editor, Scholarship, Correction, Review, etc.
- The journal also uses some symbols i.e. to provide additional information:
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REVIEW OF LITERATURE

We know that of various research methods i.e. survey method, historical method, experimental method, etc., bibliometric study is also one method which is used by various researchers for making quantitative analysis. This method would help to find out patterns of the publication.

In this study, researcher used different articles as well as books of research methodology.

Arya in the paper “Authorship trends and collaborative research in the field of veterinary medicine”, explains productivity of pattern i.e. number of authors and number of papers, and comparative analysis of publication of single verses multiple authors, etc. [2].

Akorede and Tawakalit in their paper, “Bibliometric analysis of cancer publications in Nigeria during 2008–2012”, gave the impression of statistical test of Kolmogorov Smirnov with regard to contribution of authors’ i.e. articles of single author as well as maximum collaborative 20 numbers of authors and also rank sheet of author [3].

Das in his paper, “Authorship pattern and research collaboration of journal of informatics”, gave the impression to the researcher about the year wise classification of articles, authorship pattern, total weight of ranker author, geographical diversity of authors, etc. [4].

METHODOLOGY

This study about the publication of PTJ in the period of 2011 to 2015 was carried out using the website of APTA and the library of Ahmadabad Institute of Medical Science, Ahmadabad.

Here an aggregate of 717 articles were classified with respective to the category, as well as subject, year and 3479 authors were retrieved by accessing PTJ journal. For the occurrence, the researcher liked to take out each article and count also.

Objectives of the Study

Precise objectives of this study are as under:

- To find out the scenery of authorship of PTJ;
- To prove that the collaborative publications were published maximum in the PTJ;
- To find out the various categories of articles in the PTJ; and
- To find out subject wise articles in the PTJ.

Data Analysis and Interpretation

The analyzed data is presented in tabulation form (Tables 1–5).

It is revealed from the above Table 1 that PTJ journal has published articles on various categories i.e. research reports, case reports, technical reports, perspectives, clinical guidance statements, profession watch, linking evidence and practice (LEAP), and editorial. The analyzed description of this table is as under:

- Maximum 120 articles (77.92%) out of 154 total articles were published under the category of research report during 2014 while in 2011 it was 113 articles (78.47%); whereas in the year 2013 it became 112 maximum (77.92%). Out of the 154 total articles of whole year, all are published under the category of research report.
- Ascending order of case report: 12 articles (8.33%) were published 2011 as well as 2012 also; but due to the quantity of total articles of year 2012 the difference can make on place.

10 articles (6.49%) were published in 2014 while 7 articles (4.93%) were published in 2015.

- Here it is to be noted that only 7 articles (0.98%) were published in the category of technical reports, 5 articles (8.09%) were published in the category of protocols, 1 article (0.14%) was published in the

category of clinical guidance statement and 10 articles (1.39%) were published in the category of professional watch.

- 22 articles (3.07%) out of 717 articles (100%) were published in the category of LEAP while 18 articles (2.51%) out of 717 articles (100%) were published in the category of editorial articles [5].

Table 1: Category wise Distribution of Articles.

Year	Research Report	Case Reports	Technical Reports	Perspective	Protocol	Clinical Guidance Statement	Profession Watch	Linking Evidence and Practice (LEAP)	Editorial	Total
2011	113	12	1	7	0	0	3	2	6	144
%	78.47	8.33	0.69	4.86	0.00	0.00	2.08	1.39	4.17	100.00
2012	97	12	3	9	0	0	0	5	2	128
%	75.78	9.38	2.34	7.03	0.00	0.00	0.00	3.91	1.56	100.00
2013	112	8	0	13	0	0	1	8	7	149
%	75.17	5.37	0.00	8.72	0.00	0.00	0.67	5.37	4.70	100.00
2014	120	10	1	11	1	0	3	5	3	154
%	77.92	6.49	0.65	7.14	0.65	0.00	1.95	3.25	1.95	100.00
2015	105	7	2	18	4	1	3	2	0	142
%	73.94	4.93	1.41	12.68	2.82	0.70	2.11	1.41	0.00	100.00
Total	547	49	7	58	5	1	10	22	18	717
%	76.29	6.83	0.98	8.09	0.70	0.14	1.39	3.07	2.51	100.00

Table 2: Subject wise Distribution of Articles.

Subject	2011	%	2012	%	2013	%	2014	%	2015	%
Musculoskeletal	1	0.69	2	1.56	2	1.34	0	0	0	0
Pediatric	6	4.17	8	6.25	4	2.68	17	11.04	15	10.56
Psychology	10	6.94	1	0.78	0	0.00	1	0.65	2	1.41
Physical Therapy	45	31.25	41	32.03	29	19.46	32	20.78	31	21.83
Rehabilitation	4	2.78	6	4.69	16	10.74	9	5.84	17	11.97
Gynecology	1	0.69	1	0.78	0	0.00	1	0.65	1	0.70
Orthopedic	40	27.78	25	19.53	27	18.12	42	27.27	28	19.72
Surgical	0	0.00	2	1.56	2	1.34	1	0.65	0	0.00
Metabolic Condition	0	0.00	1	0.78	1	0.67	0	0.00	0	0.00
Neurology	27	18.75	22	17.19	45	30.20	33	21.43	28	19.72
Rehabilitation	1	0.69	2	1.56	0	0.00	0	0.00	0	0.00
Electrotherapy	0	0.00	2	1.56	1	0.67	1	0.65	2	1.41
Geriatric	3	2.08	2	1.56	0	0.00	1	0.65	0	0.00
Scale for PT	2	1.39	3	2.34	6	4.03	6	3.90	8	5.63
Therapeutics	0	0.00	1	0.78	0	0.00	2	1.30	0	0.00
Obstetric	0	0.00	1	0.78	1	0.67	0	0.00	0	0.00
Education in PT	0	0.00	1	0.78	0	0.00	0	0.00	0	0.00
Cardiology	3	2.08	7	5.47	11	7.38	4	2.60	9	6.34
Exercise	1	0.69	0	0.00	3	2.01	1	0.65	0	0.00
Women Health	0	0.00	0	0.00	1	0.67	1	0.65	1	0.70
Questionnaire	0	0.00	0	0.00	0	0.00	1	0.65	0	0.00
Sports PT	0	0.00	0	0.00	0	0.00	1	0.65	0	0.00
	144	100.00	128	100.00	149	100.00	154	100.00	142	100.00

Above Table 2 describes with regard to subjective classification of articles for selective period of PTJ. It is to be noted that of during the selective period of this research study, physical therapy related articles were published maximum in 2011 to 2013, while physical therapy related orthopedic condition's articles were highest (42 articles (27.27%)) in the year 2014. Here it is also revealed that of the subject physical therapy with neurology condition related articles also were published more than 20 in the selective period 2011 to 2015.

It is revealed from the above Table 3 that for the year 2011, maximum contributions of 4 authors' articles were 24 (17.52%) out of 137 articles (100%) published. This status also became same with mass of 26 articles (18.98%) in 2012; for the year 2014, it makes

35 articles (25.55%) and for 2015, it makes 28 articles (20.44%). According to above table, following is the ascending order of total published articles on a particular year:

1. 1st rank of this study: 2014 with 154 articles (21.48%) out of total 717 articles (100%).
2. 2nd rank of this study: 2013 with 149 articles (20.78%) out of total 717 articles (100%).
3. 3rd rank of this study: 2011 with 144 articles (20.08%) out of total 717 articles (100%).
4. 4th rank of this study: 2015 with 142 articles (19.80%) out of total 717 articles (100%).
5. 5th rank of this study: 2012 with 128 articles (17.85%) out of total 717 articles (100%).

Table 3: Contributions of Authors in the Articles.

Contribution of Authors	2011	%	2012	%	2013	%	2014	%	2015	%	Total	%
1 Author	7	24.14	4	13.79	10	34.48	5	17.24	3	10.34	29	100
2 Authors	29	27.10	23	21.50	19	17.76	18	16.82	18	16.82	107	100
3 Authors	19	18.45	21	20.39	25	24.27	16	15.53	22	21.36	103	100
4 Authors	24	17.52	26	18.98	24	17.52	35	25.55	28	20.44	137	100
5 Authors	23	20.18	19	16.67	23	20.18	28	24.56	22	19.30	114	100
6 Authors	19	22.62	11	13.10	12	14.29	19	22.62	23	27.38	84	100
7 Authors	11	17.19	11	17.19	19	29.69	13	20.31	10	15.63	64	100
8 Authors	2	6.06	7	21.21	7	21.21	9	27.27	8	24.24	33	100
9 Authors	5	26.32	3	15.79	3	15.79	6	31.58	2	10.53	19	100
10 Authors	3	25.00	3	25.00	3	25.00	1	8.33	2	16.67	12	100
11 Authors	0	0.00	0	0.00	1	50.00	1	50.00	0	0.00	2	100
12 Authors	1	25.00	0	0.00	1	25.00	2	50.00	0	0.00	4	100
13 Authors	0	0.00	0	0.00	1	50.00	0	0.00	1	50.00	2	100
>13 Authors	1	16.67	0	0.00	1	16.67	1	16.67	3	50.00	6	100
Total	144	20.08	128	17.85	149	20.78	154	21.48	142	19.80	717	100

Table 4: One-Sample Kolmogorov-Smirnov Test of Contribution of Authors.

One-Sample Kolmogorov-Smirnov Test															
Particular	1 Author	2 Authors	3 Authors	4 Authors	5 Authors	6 Authors'	7 Authors'	8 Authors	9 Authors	10 Authors	11 Authors	12 Authors	13 Authors	>13 Authors	
	N	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Normal Parameters ^{a,b}	Mean	15.00	54.5000	53.5000	70.5000	59.5000	45.0000	35.5000	20.5000	14.0000	11.0000	6.5000	8.0000	7.5000	10.0000
	Std. Deviation	19.7990	74.2462	71.4178	94.0452	77.0746	55.1543	40.3051	17.6777	7.0711	1.4142	6.3640	5.6569	7.7782	5.6569
Most Extreme Differences	Absolute	.260	.260	.260	.260	.260	.260	.260	.260	.260	.260	.260	.260	.260	.260
	Positive	.260	.260	.260	.260	.260	.260	.260	.260	.260	.260	.260	.260	.260	.260
	Negative	-.260	-.260	-.260	-.260	-.260	-.260	-.260	-.260	-.260	-.260	-.260	-.260	-.260	-.260
Kolmogorov-Smirnov Z	.368	.368	.368	.368	.368	.368	.368	.368	.368	.368	.368	.368	.368	.368	
Asymp. Sig. (2-tailed)	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	

Above Table 4 explains the result of Kolmogorov Smirnov test of contributions of authors. It is revealed that bibliometric study has exploited one sample Kolmogorov Smirnov statistical test.

Table 5: Year wise Mean of Authors per Published Paper.

Particular	2011	2012	2013	2014	2015	Total
Total Number of Articles	144	128	149	154	142	717
Total Number of Authors	656	568	708	762	723	3417
Year wise Mean of Authors per Paper	4.56	4.44	4.75	4.95	5.09	4.77

$$\text{Mean(Year)} = \frac{\text{TotalNumberofAuthors}}{\text{TotalNumberofArticle}}$$

Table 5 describes the calculation of mean of total number of authors and their published articles in that particular year. Here, researcher has arranged it in ascending order as the highest 5.09 for 2015 year, 4.95 for 2014, 4.75 for 2013, 4.56 for 2011 and 4.44 for 2012.

Findings

The bibliometric study would provide the subject and research categories as keyword and help in accessing the content. Here, researcher has presented the analyzed data in tabulation form. For the purpose of calculating statistical test, here, SPSS (Statistical Package for social Science) is used. In this study, researcher finds out that of all presented data indicate the accomplishment of the objectives of this study. These descriptions are as under:

- Tables 4 and 3 described the scenery of authorship and accomplished the first objective of this study.
- Table 4 depicted that maximum published articles of PTJ were collaborate in nature during the selected periodicity. It also accomplishes the second objective of the study.
- Table 1 explains the various categories of articles i.e. research report, technical report, LEAP, etc. and fulfills the third objective of the study.
- Table 2 describes the various subjects of the para-medical science i.e. physical

therapy, neurology, electrotherapy, etc. and fulfills the last objective of this study.

CONCLUSION

In this study, researcher has successfully tried to classify all the categories of articles, patterns of authorship, subject-wise classification of all articles, etc. within the period of 2011 to 2015. Finding of this research shows that author pattern of collaboration did conform to the Kolmogorov Smirnov test of statistical law. It highlights that the maximum articles of this journal as well as para-medical science field published with collaboration efforts. It has also shown that highest collaboration of authors were made in the year of 2011 i.e. 4 authors' collaboration (17.52%) out of 144 articles (100%); this result can be obtained in the same position on the selective periodicity of this study accepted for the year 2013, in this year, 25 articles (24.27%) were published with the collaboration of 3 authors.

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Cite this Article

Minaxi AP. Bibliometric Analysis of Physical Therapy Journal During 2011–2015. *Journal of Advancements in Library Sciences*. 2017, 4(3): 109–113p.