

# Visualisation of the research productivity of the Journal Tissue Engineering & Regenerative Medicine from 2014-2018 by bibliometric analysis

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## Abstract

This research paper aims to analysis the publications detail of the journal Tissue Engineering & Medicine for a period from 2014 to 2018. The authors tries to analyse total 372 numbers of publications in different aspects like type of publication, year wise, the authorship patterns of articles, country wise distribution , length of the papers etc. Result reveals that the maximum no. of articles are published in 2016. It is found that maximum 34 countries are contributed to the journal during the time period of 2014-2016 where India stands in fifth position. Collaborative papers are the dominant over single author work. More than 97% of the total pepers are contributed by multiauthors. It is observed that total 372 articles received 2754 citations during 2014-2018 with an average of 7 citations per article.

**Keywords:** Bibliometric analysis, authorship pattern, collaboration, Citation pattern

## 1. Introduction

Intellectual works have reflected in published literature with a motto to boost with their innovative ideas towards the extreme development of the subject domain. In this context Bibliometric study is used as an instrument to measure the quality of the Publications. It helps both the users and the creators as well. The information manager with the provided Bibliometric study is able to take right decision whether to go for the journal or not for collection building where the creator finds the appropriate space to contribute so as to get proper reference. Single journal Bibliometric studies helps to find out the research trends in a specific field. The year wise distribution, authorship pattern, collaboration etc. The present study attempts to analyse the publications in the journal “Tissue Engineering & regenerative medicine from 2009-2018” .

Tissue Engineering and Regenerative Medicine is a six-issue per year journal published by Springer and is the official publication of the Korean Tissue Engineering and Regenerative Medicine Society. The journal aims to provide information on basic research related to tissue engineering and regenerative medicine, as well as applications in tissue growth and regeneration across various disciplines. It is a peer-reviewed journal that includes original research articles, reviews, and in-depth studies in fields such as tissue engineering, medical cell therapy, cell biology, stem cell biology, and medicine. The journal focuses on the regeneration of various organs and tissues, including the brain and nervous system, cardiovascular system, skeletal

system, bone and skin, gastrointestinal organs, and other parts of the body. Tissue Engineering and Regenerative Medicine has been indexed and included in PubMed/MEDLINE, and all articles published since 2019 are searchable in PubMed.

## **2. Literature Review**

The study of review of literature is an important aspect of any academic research. The analysis of review of literature enables one to identify the past trends and areas of research concentration in any particular branch of science. The research in library and information science has received wide attention among researchers, policy makers, and scientists. They have conducted research in various areas of library science and management of library affairs. The study of previous research findings gives a clue about the potential areas of fresh research and missing links in the process of research in information science. Hence the review of literature study in a systematic manner.

**Mondal and Roy (2018)** in their paper analysed citation analysis of PhD theses awarded during the period 1986-2015 in five sub- subjects of Political Science under the University of Burdwan. It is found that, out 56 PhD theses, the maximum contribution was in Public Administration (31 theses). The study confirmed that, Books was found to be most cited materials (51.51%) .

**Devi, Kumar and Rohit (2018)** studied the bibliometric analysis of the scholarly publication of the journal “Library Trends” during the period 2012 to 2016. It is found that single authored publications are highest in number. Regarding the length of the paper it is concluded that maximum 29 out of 219 are of 11-21 page,s scale. USA and UK ranked as first and second as the contributors.

**Sahoo, Mohanty and Dash (2018)** have explored the publication pattern of scholarly articles of the Journal “Information Processing and Management, ”. The paper examines and presents an analysis of 550 articles cited within the period from 2008 to 2013. Results indicated that a high level of collaboration exists among the authors, Information Science taking shape of a developing discipline within LIS and USA occupies the dominant position in terms of productive authors, institutions and country.

**Ramakrishnan... etal (2016)** in their paper present a bibliometric analysis of the literature output in the field of Swine Flu covered in the bibliographic database namely MEDLINE. It was found that 34.02% are journal articles. 93.56% articles are of English language and followed by Chinese and Russian languages. United States has contributed the highest number of records in the study. India has the 5th position among the countries. 32.70% of the contributors were by more than five authors and 68.15% covered by more than one author contribution. Indian efforts in Swine Flu research are greater in 3 years out of 10 years of study.

**Dongare and Khaparde (2015)** have provided a Scientometric study of 76 papers from the "Online Information Review" of the International Journal of Health Informatics in Developing Countries that were published in 5 volumes between 2011 and 2015. The outcome demonstrates that, out of all the years included by the study, 2011 had the most contributions. The majority of articles are written by two authors. The USA received the highest score and contributed to all issues. With a pitiful proportion and an average of 13.22 pages per article, Saudi Arabia comes in second.

**Barik and Jena (2013)** presented their research on 180 articles from 21 volumes in the five years from 2008 to 2012 which are covered by the bibliometric study of the Journal of Knowledge Management Practice. Findings indicate that out of 180 papers published throughout five years, 42 (23.3%) were published in 2011. 42.7% of the total contributions were made by a single author. There are typically 19 citations per article. According to the geographical distribution of articles, the USA has contributed the most with 34 articles (18.8%), while the majority of articles (69.4%) are published with a page range of 11–20.

**Singh and Bebi (2013)** present citation analysis of PhD theses submitted in the discipline of sociology of the University of Delhi during 1995-2010. The study is based on the 5766 citations taken out from 25 PhD theses of sociology. The study finds that highest number of citations was single authored (83.94 %), and 67.23 % citations were from books and only 22.20 % citations were from journals. The country-wise scattering of citations reveals that 2536 (45.52 %) citations were from India and it was followed by USA and UK.

**Goyal...etal (2013)** in their paper "Authorship patterns and collaborative research trends in the field of chemical sciences" studied in the field of Chemical Sciences based on the data collected from Indian Journal of Chemistry Section-B (IJCB) published during the 2002-2011. Outcome of the study shows that multi authored articles 97.24% prevail the single authored articles 2.75%. The degree of collaboration in the field of chemical sciences is 0.97. Average number of authors per paper varies from 3.21-3.78. This study is in support for the fact that chemical sciences research is collaborative in all aspects.

**Arya(2012)** has studied the authorship pattern and collaborative research trends in the field of veterinary medicine based on the data collected from 'Indian Journal of Veterinary Medicine' published during the period 1999 - 2007. Observations show that multi authored papers (95.55%) predominate single authored papers (4.45%). The degree of collaboration in the field of veterinary medicine is 0.96. Average number of authors per paper varies form 2.92 - 4.08. This study favours the fact that scientific research is collaborative in nature.

**Nandi, Bandyopadhyay and Kumar (2009)** revealed that one hundred forty one theses submitted from Chemistry Department of the University of Burdwan during 1960-2000 and 979 articles produced based on them have been analysed for finding the trend of research, article

productivity, choice of journals, authorship pattern and the position of the university in the state. Highest number of theses (30) was submitted during 1986-1990 and 1991-1995. Highest number of papers (283) was published during 1991-1995. Maximum number of theses (58) was submitted in inorganic chemistry followed by nuclear and analytical chemistry (34). About fifty three percent of the papers (522) are published in Indian journals. Other countries of preference for publishing papers are Netherlands (15.32%), UK (11.64%) and USA (10.01%).

### 3. Objective of the Study

The present study has been carried out to study the following objectives;

- Distribution of articles by publication type
- to study the year wise distribution of articles,
- to study the authorship pattern of the articles
- to study the country wise contribution of articles
- to study the citation patterns of articles
- to find out the length of articles contributed in the journal

### 4. Methodology followed

According to the objective of the study, Scopus database is searched with a query "Tissue Engineering and Regenerative Medicine" in source title. The resulted data sheet is further refined to the year from 2014 to 2018. Total 372 records are found and exported to MS-excel files. The collected data are organized and analyzed and studied using the MS-Excel spread sheet.

### 5. Analysis of data

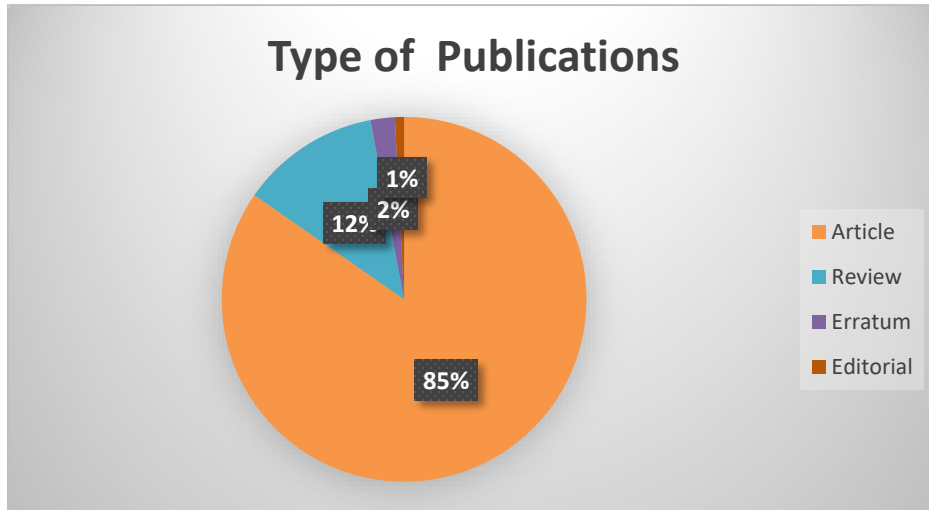
#### 5.1 Publication by document type

It is observed that total four types of documents are found during the study. It is evident from the table 01 that article is the most preferable type of publication for this journal.

Sl. No	Document Type	No of Publications	% of publications
1	Article	315	84.68
2	Review	46	12.36
3	Erratum	8	02.16
4	Editorial	3	0.80
	Total	372	100

**Table 01: Publication by document type**

Table-01 depicts the types of document published in the journal of Tissue Engineering and regenerative medicine during the period of 2014-2018. It is found that most of the documents published in article type(84.68%) followed by reviews of 12.36%.



**Figure:01 Types of publications**

### 5.2 Year wise distribution of articles

Total 372 no of publications are arranged yearwise. In 2014, two supplementary issues are published alongwith six regular issues as in other years. Total articles varies fro 70 to 79 during 2014-2018.

<i><b>Publications in Years</b></i>	<i><b>No. of Issue</b></i>	<i><b>Total Articles</b></i>	<i><b>% of Publication</b></i>	<i><b>Cumulative Publication</b></i>
<i>2014</i>	8	76	20.43	20.43
<i>2015</i>	6	70	18.82	39.25
<i>2016</i>	6	79	21.24	60.48
<i>2017</i>	6	76	20.43	80.91
<i>2018</i>	6	71	19.09	100.00

**Table 02: Year wise distribution of articles**

Table 02 shows that the article per year is increasing slowly. In 2014, in spite of the two supplementary issues, the total no of publication is 76. It is observed that in the year 2016, total 79 articles are published which is maximum i.e 21.24%. Minimum no of articles published in the year 2015 with 70 articles, which is 18.82% . But it is clear from the table that average 70 papers are being published in every year from 2014-2018.

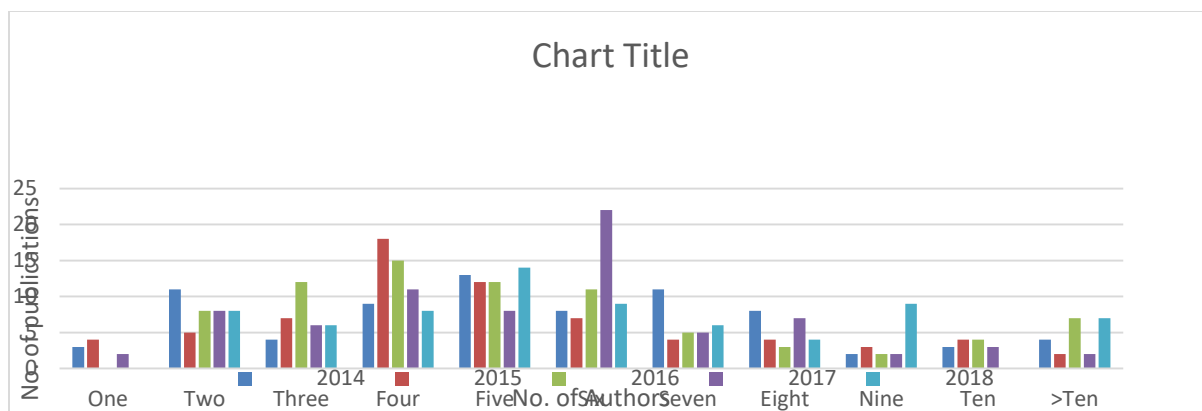
### 5.3 Authorship pattern of the articles

Authors have used 11 types of authorship patterns to find the collaborative contributions towards the articles in the journal. Articles contributed by each category have been tabulated in table 03 to draw a clear understanding the pattern of authorship in the present study.

No of Authors	Publications in Years					Total no of Publications	% of publication
	2014	2015	2016	2017	2018		
<b>One</b>	3	4	0	2	0	9	2.42
<b>Two</b>	11	5	8	8	8	40	10.75
<b>Three</b>	4	7	12	6	6	35	9.41
<b>Four</b>	9	18	15	11	8	61	16.39
<b>Five</b>	13	12	12	8	14	59	15.87
<b>Six</b>	8	7	11	22	9	57	15.32
<b>Seven</b>	11	4	5	5	6	31	8.33
<b>Eight</b>	8	4	3	7	4	26	6.99
<b>Nine</b>	2	3	2	2	9	18	4.84
<b>Ten</b>	3	4	4	3	0	14	3.76
<b>&gt;Ten</b>	4	2	7	2	7	22	5.92
<b>Total</b>	76	70	79	76	71	372	100

**Table:03 Authorship pattern of articles**

It is found from table 03 that the highest no of publications amongst the given categories is 61 articles, contributed by the collaboration of four authors. It is followed by 59 articles published by the collaboration of 5 authors. It is also observed that the least no of publications is 9 articles by single author.



**Figure:02 Authorship pattern of the Journal**

#### 5.4 country wise contribution of articles

The study reveals that total 34 countries have contributed towards the journal. It is revealed that maximum no. of contributions are from South Korea(264), followed by United States (35) and China (30). India with 14 contributions is in the fourth position. The top 10 countries and their contributions is listed in table 04.

SL. NO	NAME OF THE COUNTRY	NO OF CONTRIBUTIONS
1	South Korea	264
2	United States	35
3	China	30
4	India	14
5	Iran	14
6	Malaysia	10
7	United Kingdom	10
8	Japan	9
9	Singapore	7
10	Canada	4

**Table:04 country wise contribution of articles**

#### 5.5 Citation Pattern of Publications

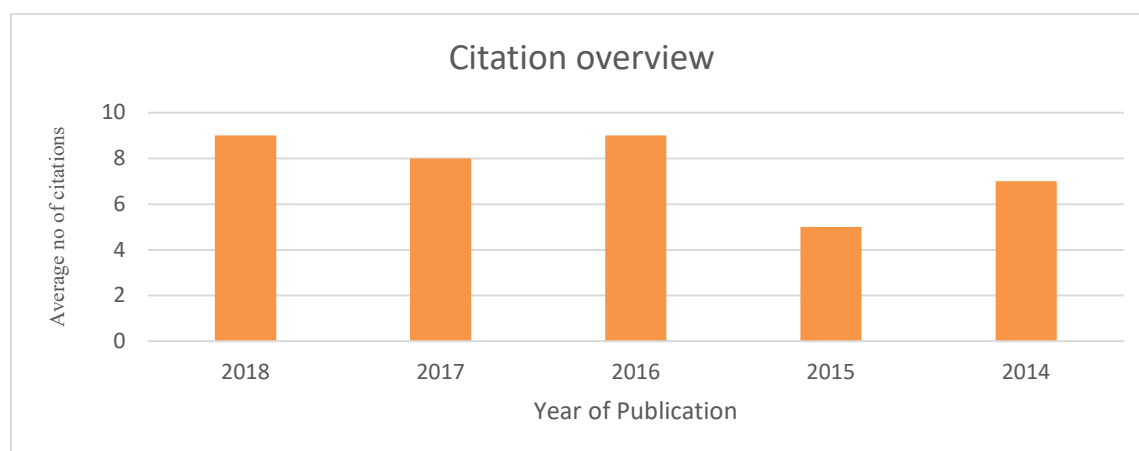
Total 2754 citations are received for 372 no of articles as per scopus database. The result is analysed and presented in table 05.

Year of Publication	No of Publications	No of citations received	*Average no of citations
2018	71	608	9
2017	76	585	8
2016	79	710	9
2015	76	372	5
2014	70	479	7
<b>Total</b>	<b>372</b>	<b>2754</b>	<b>7</b>

\*Rounded to the nearest whole number

**Table:05 Citation pattern of the publications**

The investigators reveal that total 2754 no. of citations are received over the five years for the 372 publications. Maximum no of citations (710) are received in the year 2016 followed by the year 2017 of 608 no of citations. However the average no of citations varies from year to year. The average no. of citations determined for the whole articles through out the year is 7.



**Figure: 03 Citation pattern of the journals**

### 5.6 Length of the articles

The length of the publications are studied. It is found that it varies from 1 to 25. So investigators use scales of five differences to measure the length of the article statistically.

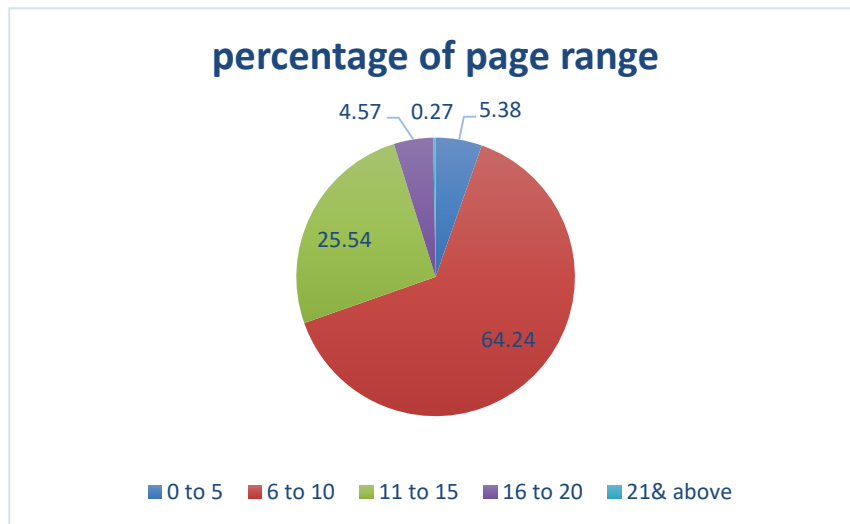
No of pages	2014	2015	2016	2017	2018	Total	percentage
<b>0-5</b>	13	1	3	2	1	20	05.38
<b>6-10</b>	61	56	51	43	28	239	64.24
<b>11-15</b>	2	12	23	26	32	95	25.54
<b>16-20</b>	0	1	2	5	9	17	04.57
<b>21&amp; above</b>	0	0	0	0	1	1	0.27
<b>Total</b>	76	70	79	76	71	372	100

**Table :06 Length of the articles**



The investigators use scales of 05 differences to measure the length of the articles. Total observations from the 372 articles are tabulated with the page ranges.

It is found that maximum 239 articles (64.24%) out of 372 are within the page range of 6-10. Maximum of 57 articles are of 8 pages, out of 372. There is only one paper of more than 21 pages which is the minimum.



**Figure : 04 Length of articles**

## 6. Findings

The findings of the study is summarized as follows:

**6.1** Most of the publications are articles (84.68%).

**6.2** Articles per year is increasing slowly. Publications per volume is not constant.

**6.3** Maximum articles are from multi-authored. From study it is found that maximum percentage (16.39%) of publications is of 4 authors, followed by 5 and 6 authors.

**6.4** Studying the country-wise contribution of article it is found that south korea is in the top position with 264 articles followed by united states and china. India is placed in the 4<sup>th</sup> position by a contribution of 14 articles.

**6.5** Total 372 articles received 2754 citations during 2014-2018 with an average of 7 citations per article.

**6.6** It is proved that maximum articles (239) were published with the page count ranging from 6-10; which is 64.24% of the whole published article during the same year.

## 7. Conclusions

The journal of Tissue Engineering and Regenerative Medicine is a top ranking journal among Biomedical and Engineering Journals. Most of the articles are of more than one authors. Multi authored works are dominating the research area. It implies it publishes papers with coverage of 34 countries. Most of the articles are of collaborative researches among Institutions. India's contribution during 2014-2018 is of 14 publications. It has good Impact factor. It senses really an Internal journal and a major one in the subject area of Biomedical Engineering.

## Acknowledgement

This research is a part of the PhD work of Ms. Puspita Mishra.

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