Research Productivity from Asia in Parkinson's Disease

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Abstract -The paper analyses the literature produced in Parkinson's research during the last decade (2008-2017) from the Asian countries using scientometric methods. The data was taken from the *ISI Web of Science*. Using Microsoft excel the data was analyzed. There was no correlation between productivity and impact factor. Though China is found to be ahead of all Asian countries in productivity, its impact factor is less than Japan and Israel. Open access articles were cited more than limited access articles.
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I. INTRODUCTION

Scientometrics can be described as a systematic approach for analyzing the past, present, and future development of science. Renowned father of Scientometrics, Derek De Solla Price, defined scientometrics as a science about science. It provides researchers with various concepts, models, and techniques that may be applied to an academic discipline in order to explore its foundations, state, intellectual core, and potential future development.

Parkinson's disease is a degenerative disease of the nervous system. This disease owes its name to James Parkinson, a British physician who in 1817 published a paper, "An essay on the shaking palsy". Parkinson's disease is classified under movement disorder. During the early stages the symptoms include shaking, rigidity, slowness of movement, and difficulty with walking. Thinking and behavioral problems may also occur.

Parkinson's disease (PD) is considered as the second most common neurodegenerative disorder after Alzheimer's disease and affects approximately seven million people globally and one million people in the United States. In the developed countries the prevalence in a population at a given time is about 0.3%. PD is more common in older population and rates rises from 1% in those over 60 years of age to 4% of the population over 80. The mean age for the onset of this disease is around 60 years, although about 5–10% of cases, which is classified as young onset PD, begin between the ages of 20 and 50.

II. OBJECTIVE OF THE STUDY

The main aim of the study is to get a comprehensive view of literature output in Parkinson's disease.

The other objectives include:

1. To find the most preferred journals in the world by the scientists.
2. To find the most preferred journals in Asian countries.
3. To find if international collaboration leads to more citations.
4. To find if the open access articles receive more citations.

III. HYPOTHESIS OF THE STUDY

The following are the hypothesis of the study:

1. There is no correlation between the number of papers produced and the h index.
2. The open access papers receive more citations than papers with limited access.

IV. METHODOLOGY

The data for the study was taken from the ISI Web of Science using the term, "Parkinson". The time span for the study was ten years; 2008-2017. The world output in PD is analyzed and then the output of top 5 countries in Asia was taken for study. Papers in PD, from the top five productive Asian countries (China, Japan, South Korea, India and Israel) were downloaded and analyzed with excel software. The 100 most cited papers from each country were downloaded and analyzed for the study.

V. ANALYSIS AND DISCUSSION

It was found on analysis that about 62388 papers are produced in the world during the last decade (2008-2017). America is the leading producer in PD literature followed by England and Germany. China is the leading producer in PD literature among Asian countries.

A. Productivity in Asia

Only 29 out of the 48 Asian countries produced at least one article in PD. There are 14326 research papers produced from the Asian countries. This amounts to 23% of the total literature produced in the world. The number of papers produced, citations received, h index, etc. of top 5 countries is given in Table I.

TABLE I MOST PRODUCTIVE ASIAN COUNTRIES AND RANKING ACCORDING TO THE H INDEX

S. No.	Country	No. of Papers	Citations Received	Impact (Citations Received per item)	h Index	Ranking
1	China	4664	67,833	14.54	87	II
2	Japan	3010	58,826	19.54	94	I
3	South Korea	1889	35,480	18.78	75	III
4	India	1290	19,747	15.31	57	V
5	Israel	891	23,250	26.09	69	IV

When the type of papers published in Asia is taken into consideration nearly 74 % of the papers published are articles followed by reviews (11%), meeting abstracts (11%) and others (4%)

B. Preferred Journals

The publication sources were analyzed, and Journal of the neurological sciences was found to be the most preferred journal followed by Parkinsonism related disorder and then Movement disorder. When each Asian country is taken separately it was found that the most preferred journal by China is Neuroscience letters. Japan preferred Journal of the Neurological Sciences. Japan has about 272 articles in this journal which is about 56% of the total Asian contribution to the journal. When the total world output in PD is taken Movement Disorder (17%) was found to be the most cited journal followed by Parkinsonism and related disorder and Neurology. Among the five Asian countries, Israel is the only country where Movement Disorder is ranked first as the most preferred journal. Parkinsonism Related Disorders was found to be the most preferred journal in India as well as in South Korea. Table II gives details of the most preferred journals from all the Asian countries.

TABLE II MOST PREFERRED JOURNALS IN ASIA

S. No.	Journal	No. of Papers
1	Journal of the Neurological Sciences	483
2	Parkinsonism Related Disorders	425
3	Movement Disorders	377
4	Plos One	376
5	Neuroscience letters	311
6	European Journal of Neurology	221
7	Brain research	175
8	Scientific reports	168
9	Journal of Neurochemistry	149
10	Biochemical And Biophysical Research Communications	143

C. International Collaboration

China collaborates mostly with USA producing about 17.5% articles, England and Canada are the second and third in collaboration. Nearly 67 articles out of the hundred most cited articles from China are produced as a result of the international collaboration. 53% of the most cited articles from Japan have international collaboration. 11.8% of the articles from Japan are produced from collaboration with the USA. In the case of S.Korea, only 30% of articles out of the hundred most cited are produced by international collaboration. In the case of Israel, 50% of articles in the top 100 citations are from international collaboration. India has 35% international collaboration resultant articles in the top 100 category. It was also found that 78% of articles which belong to the top 100 cited articles category were produced as a result of research funding.

TABLE III CITATIONS RECEIVED BY 100 MOST CITED ARTICLES COUNTRY WISE

S. No.	Country	Open Access		Limited Access		Total Citations
		Articles	Citations	Articles	Citations	
1	China	52	6626	48	6587	13213
2	Japan	66	13688	34	5694	19382
3	India	35	3594	65	4698	8292
4	Israel	40	6019	60	6177	12196
5	S. Korea	58	9366	42	5141	14507

Japan has the highest citation score compared to the other nations.

D. Open Access Publications

It was found that out of the top 100 cited papers, the papers with open access policy were most cited than papers which had limited access or only publisher access. Details are given in Table III.

During the analysis both the hypotheses were tested and validated (Table I &III).

VI. FINDINGS OF THE STUDY

The following are the findings in this research:

1. The research papers in Parkinson's disease research shows a steady growth both globally as well as among Asian countries.
2. In the case of Asian countries there is no correlation between the number of publications and h-index. China produces the highest number of publications but Japan has the highest h index. Israel has the highest impact though it produces the least papers among the five Asian countries.
3. There is a positive relation between the highest number of citations and joint collaboration. The highest citation shares were for articles with many foreign collaboration.
4. For publishing the research communications "Movement Disorder" is the most preferred journal by world scientists.
5. Asian countries contribute mostly to "Journal of the Neurological Sciences". Movement Disorder ranks third in the list of most preferred list of journals followed by "Parkinsonism Related Disorders".
6. The journal "Movement Disorder" was found to be the most cited journal followed by "Lancet Neurology" and "Journal of Neuroscience".

VII. CONCLUSION

Scientometrics is a reliable tool to evaluate and quantify the scientific production. Parkinson's disease research has been increasing in Asian countries contributing to about 21.5% of the total world output. Research funding and more international collaboration are needed for novel research. The papers with international collaboration have more impact factor than locally produced papers. It was revealed that publishing trends depended on the productivity of contributors, the quality of information and also the quality of journal in which the papers are published.

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