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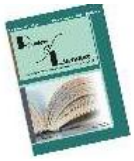

SCIENTOMETRIC STUDIES IN INDIA: A REVIEW

Dr. Praveenkumar Kumbargoudar
Deputy Librarian , Gulbarga University ,
Kalaburagi , Karnataka.

ABSTRACT:

Scientometrics is of latest subject area in library and information science, which used to measure the quality of research publications based on different techniques such as h-index, impact factor, etc. Many of the scientometric studies on different subjects were made in India to assess the quality of research output. The paper reviewed the selected papers on scientometric analysis in different subject disciplines in India.

KEYWORDS : Scientometrics , library and information science.

INTRODUCTION:

Scientometrics is the most interesting subject area in the field of library and information science, which can be applied to any discipline irrespective of their period of evolution. It involves quantitative studies of scientific activities, including, among others, publication, and so overlaps bibliometrics to some extent (Tague-Sutcliffe, 1992). Vinkler (2010) stated that scientometrics cannot be restricted with the scope of a scientific discipline. He broadened the definition as quantitative study of people, groups, matters and phenomena in science and their relationships. Chun-Yang Yin (2011), determined the correlation strength between impact factor (JIF), h-index and EigenfactorTM of chemical engineering (CE) journals and its subsequent relevance in indicating the influence and prestige of the journals. He believe that such combination may even apply for other scientific journals as well and this warrants future studies involving bibliometricians for respective fields (Karpagam, et al, 2011).

Like bibliometrics, scientometrics used to measure worthiness of research output that is published in books and research papers in a subject discipline across the world. It also helps to compare and evaluate the quality of research in different subject disciplines across the world. It is essential to know about the scientometric analysis that are made in different subject disciplines. Hence, the present paper brought a brief review of selected research papers made on scientometric analysis in India.

SCIENTOMETRIC ANALYSIS: A REVIEW

Mooghali, et al (2011) analyzed the scientometric literature in their paper entitled **"Scientometric Analysis of the Scientometric Literature"** in **'International Journal of Information Science and Management'**. Using bibliographic records from the Social Science Citation Index, Science Citation Index, and Arts & Humanities Citation Index, this paper tries to give a complete view of the evolution of the field of Scientometrics based on its literature published during 1980 to 2009. This is a descriptive survey using scientometric indicators. Findings revealed that out of 691 articles in the field of Scientometrics, a total number of 183 articles (26.48%) were written during 1980 to 2009 by the top ten authors. Some of these

articles were produced in authors' collaboration and some of them were by single authors. Geographical analysis indicated that the field had evolved considerably in different regions of the world. Hungarian Academy of Science with 40 records (5.71%) was the most productive institution in the field of Scientometrics. Furthermore, chronological analysis disclosed that the scientific production in the field of Scientometrics showed a slow increase from 1980 to 2009. The overwhelming majority of documents were in English, and the international journal of *Scientometrics* was the most prolific journal in the field. It has also been declared that 67.87% of the literature was published in the area of Library and Information Science.

Chanda Arya (2013) in their article entitled **"Sadhana: Academy Proceedings in Engineering Sciences: A Scientometric Analysis"** published in **'Sadhana'**. This study presents a scientometric analysis of 253 articles published in Sadhana during the year 2005–2009. Five volumes of the journal are taken up to observe the distribution of contribution, authorship pattern, institution-wise distribution, geographical distribution of contribution, average length of paper, tables and illustrations used and citation pattern in each volume. Results indicate that highest number of papers have been written by two authors. The contributions received in this journal are more from India than from the other countries. Foreign documents show their more representation in references cited. Journals are referred more frequently than other documents. The average number of references per article is 23.72 and 200.602 per volume.

Bharvi Dutt and **Khaiser Nikham (2014)** published paper on **"Scientometrics of Collaboration Pattern in Solar Cell Research in India"** in **'Annals of Library and Information Studies'**. The paper looks into collaboration in solar cell research in India as reflected by the publications indexed in Web of Science for a period of 20 years from 1991-2010. Almost half of the total output emerged out of domestic and international collaboration. Academic institutions had almost equal proportion of output emerging from domestic as well international collaboration. Among the prolific institutions National Physical Laboratory-Delhi of the Council of Scientific and Industrial Research had the highest publications emerging out of collaborative research. Indian researchers collaborated with their counterparts in 31 countries; however, South Korea, Japan, USA, Germany, England, France and Greece were dominant collaborating research partners. Various bibilometric indicators have been used to examine collaborative research activity. Research collaboration gained momentum during the later decade. International collaborative output had more impact compared to domestic collaboration in terms of citations per paper.

Gourikeremath, et al (2014) in their paper entitled **"Scientometric Analysis of Physical Chemistry Research in Universities Accredited with UPE Status in India"** published in **'International Journal of Library Science and Research"**, analyzed the research output in the field of Physical Chemistry by the faculties of 6 Universities selected under UPE (Universities with Potential for excellence) status in the 11^{th} plan of UGC (University Grant Commission) in India. The data used for the study was retrieved from ISI Web of Science database- Science Citation Index Expanded (SCIE) for the period 2001-2012. The output of Physical Chemistry literature has been analyzed by year, document type, authorship pattern and collaboration pattern at different levels viz. international, national and local. Results of the study reveal that: i) the physical chemistry literature has grown steadily during the study period except for 2001 and 2003: ii) articles play a predominant source of publication of physical chemistry literature; iii) the physical chemistry research in UPE selected universities of India is fairly collaborative.

Prakasan, et al (2014) writes on **"Scientometric Facts on International Collaborative Indian Publications"** in **'Current Science'**. The upward trend in collaborative S&T research at the international level is significant in the present Information and Communication Technology era. The present study focuses on analyzing India's strengths and weaknesses in collaborative research at the international level and collaborative fields are analyzed for their macro- and micro-levels. The chronological trend of international collaboration, the collaborative countries, quality of the collaborative publications, collaborative fields, specialization in collaboration, etc. are the main criteria evaluated in the present work.

Sagar, et al (2014) conducted a study entitled **"Agriculture Research in India: A Scientometric Mapping of Publications"** in **'DESIDOC Journal of Library & Information Technology'**. The study analyses the agriculture research publications in India during 1993-2012 based on the Web of Science database. The objective of the study was to perform a scientometric analysis of all agriculture research publications by Indian scientists. The parameters studied include growth of publications and citations, domain-wise

distribution of publications and citations, activity index, international collaboration, highly productive institutions, highly preferred journals, and highly cited publications.

Sivakami and **Baskaran (2014)** write on **"A Scientometric Analysis of Research Productivity in Swine Flu Disease"** in **'International Journal of Library and Information Studies'**. Swine Flu is that, unlike seasonal flu, which is typically most dangerous to the very young, elderly and those with a weakened immune system. Swine flu can also be threatening to young and healthy people. By keeping this in mind the researcher intends to study the research productivity of Swine Flu. This study attempts to analyze the performance of researcher working in the field of swine flu in terms of relative growth rate, authorship pattern, scattering of articles in different sources and country wise distribution. The period of study was 2001to 2012. A total of 50627 records were obtained from MEDLINE databases have been taken for this study. The MEDLINE is freely available on the Internet and searchable via PubMed and NLM's National Center, compiled by NLM (National Library of Medicine). All kinds of resources are fallen in highest in the year 2010 & 2011. Collaborative authors' productivity is more than a single contribution. The degree of collaboration C=0.884 represents 88 percent of collaborative authors article that were published during the study periods. Bradford's law fits well on sample.

Gupta and **Gupta (2014)** published **"Prostate Cancer Research in India: A Scientometric Analysis of Publications Output during 2014-13"** in **'International Journal of Cancer Therapy and Oncology'**. The authors examined 1,368 publications on prostate cancer in India, as covered in Scopus database during 2004-13, experiencing an annual average growth rate of 18.77% and citation impact of 5.23. The world prostate cancer output (89,994 publications) came from several countries, of which the top 15 (United States, United Kingdom, Germany, Canada, Italy, Japan, and China) accounts for 94.80% share of the global output during 2004-13. India's global publication share was 1.52% and hold 14th rank in global publication output during 2004-13. The Indian prostate cancer output came from several organizations and authors, of which the top 20 and 19 contributed 41.81% and 24.05% share, respectively, during 2004-13. India's international collaborative share in prostate cancer was 23.39%, which decreased from 24.42% to 22.98% from 2004-08 to 2009-13. Medicine accounted for the largest share (59.50%) of output in prostate cancer followed by biochemistry, genetics and molecular biology (40.13%), pharmacology, toxicology & pharmaceutics (27.63%), chemistry (8.55%), agricultural and biological sciences (4.31% share), and immunology and microbiology (2.70% share) during 2004-13. Diagnosis, screening, chemotherapy, radiotherapy, pathology and prognosis together account for 60.24% publications share among treatments methods used in Indian prostate cancer research during 2004-13. Only Delhi, Maharashtra, Uttar Pradesh and Tamil Nadu together contributed 57.82% share in Indian publications output in prostate cancer during 2004-13. The authors stressed the need for developing national policy for prostate cancer which should take care of screening for detection and diagnosis, management and treatment options of the prostate cancer patients in India.

Dwivedi, et al (2015) published their paper on **"Scientometric Profile of Organic Chemistry Research in India During 2004–2013"** in **'Current Science'**. An analysis of 17,344 papers published by Indian scientists and indexed by Web of Science in the discipline of organic chemistry and its sub-disciplines during 2004–2013 indicates that the Indian output has increased significantly in the later period. Academic institutions contributed about 46% of the total output followed by the Council of Scientific and Industrial Research (CSIR) with 26% of the total output. The most prolific institutions among them mainly belonging to academic institutions and CSIR contributed about 60% of the total output. The value of citation per paper for most of the prolific institutions was higher than the Indian average. Similar trend was observed for the relative citation impact. Indian researchers in the discipline of organic chemistry published their papers in international journals with impact factor greater than 1. About 11% of the papers published by Indian scientists in the discipline of organic chemistry during 2004–2013 remained uncited.

Vinita and **Srinivasan (2015)** published paper entitled **"Scientometric Nuclear Research: A Global Perspective"** in **'IOSR Journal Of Humanities And Social Science'**. Scientometrics is used to describe the study of science: growth, structure, interrelationships and productivity. Scientometrics is related to and has overlapping interests with bibliometrics and informetrics. The terms bibliometrics, scientometrics, and informetrics refer to component fields related to the study of the dynamics of disciplines as reflected in the production of their literature. Areas of study range from charting changes in the output of a scholarly field

through time and across countries, to the library collection problem of maintaining control of the output, and to the low publication productivity of most researchers. This article narrates the nuclear research at global level.

Sudhahar and **Kishore Kumar (2016)** published **"Scientometric Analysis of Research Output of Coconut"** in **'International Journal of Library Science and Information Management'**. The authors have analyzed the research output on coconut research during the period of 2000-2014 and the analyses included research growth, rank, LCS, GCS. It also analysis that the characteristics of most productive institutions, authors and high-cited papers. This study was conducted using data from the Web of science database over the time period of 2000-2014.

CONCLUDING REMARKS:

It is found from the abovementioned studies that, much of the scientific literature is analyzed using scientometric techniques. Scientometrics is one of the technique for the information researchers to evaluate the research publications across the world and even compare the research output of different countries in specific subject discipline. Apart from these advantages, it is also useful to reveal the originality and worthiness of the research output in terms of publications. Hence, it is suggested for more studies in scientometrics.

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