CONTENT ANALYSIS OF "JOURNAL PHARMACEUTICAL RESEARCH"

Dr. Shashank S. Sonwane* Satish Vasant Dandge**

***Assistant Professor**
Dept. of Library and Information Science
Dr. Babasaheb Ambedkar Marathwada University
Aurangabad, Maharashtra State, India

****MLISc. Student**
Dept. of Library and Information Science
Dr. Babasaheb Ambedkar Marathwada University
Aurangabad, Maharashtra State, India

QR Code

ABSTRACT: - *This paper attempts to highlights the quantitative assessment of status of the Journal by way of analyzing the various features of Journal "Pharmaceutical Research". During 2010-2014 a total of 1385 Articles were published in the Journal "Pharmaceutical Research" by researchers in various countries.*

KEY WORDS – ***Authorship collaboration, collaboration pattern, communication channel,***

1 INTRODUCTION

Content analysis is rapidly becoming less of a tool to be used in the experimental manipulation of the communication process. In these instances of experimental studies, systematic changes in content are made and documented through content analysis, and the audiences are observed for the effects of these changes.

The specific role to be played by content analysis in organizing for recall the world's store of recorded knowledge. Content analysis appears to have two general and major functions. The first is to provide the descriptive abstract of any document at a level and of such a nature as will indicate what information may be found in it. The

second is to provide guidelines in transforming document content from one medium to another and in reducing content for ease of bibliographic access.

The "Pharmaceutical Research" is an international, peer-reviewed journal published monthly that aims to its readers with a unique forum for the exchange and sharing of information in social economics.

2 OBJECTIVES OF THE STUDY

The main objective of the study is to analyze the content of Journal of "Pharmaceutical Research" and make the quantitative assessment of status of the Journal by way of analyzing the following features of Journal

1. To find out year-wise growth of publications,
2. To find out Geographical distribution of research output,
3. To find out the authorship and collaboration pattern in the publication,
4. To find out the extent of international collaboration,
5. To find out the most productive authors in the field,
6. To find out organization – wise distribution of publication,
7. To find out the channels of communications used by the scientists and
8. To find out the high frequency keywords appeared in the channels of communication.

3 SCOPE & LIMITATION OF THE STUDY

Scope of study is restricted to the "Pharmaceutical Research" published during 2010 to 2014. The papers presented in the Journal are analyzed using content analysis technique.

The present study is limited to the total numbers of 1385 papers published during 2010 to 2014.

4 HYPOTHESIS OF THE STUDY

The study consists of following hypothesis:

1. Authorship trend is towards multiple authored papers.

2. USA is the high productive country.

3. Majority of the affiliated Institution are from USA.

5 ANALYSIS OF "INTERNATIONAL JOURNAL OF SOCIAL ECONOMICS"

In views of the objectives of the present study, analysis of "Pharmaceutical Research" is presented further (International Journal of Pharmaceutical Research, 2014).

5.1 YEAR-WISE PUBLICATION PRODUCTIVITY AND COLLABORATION RATE

The word publication means the act of publishing .Productivity refers to measures of output from production processes, per unit of input. Collaboration is a recursive process where two or more people or organizations work together toward an intersection of common goals

Table 5.1: Year-Wise Publication Productivity and Collaboration Rate

Year	Single authored publication	Multi authored publication	Total no. of publication	Collaboration Rate
2010	9	247	256	0.96
2011	13	271	284	0.95
2012	4	285	289	0.99
2013	6	263	269	0.98
2014	4	283	287	0.99
Total	**36**	**1349**	**1385**	0.97

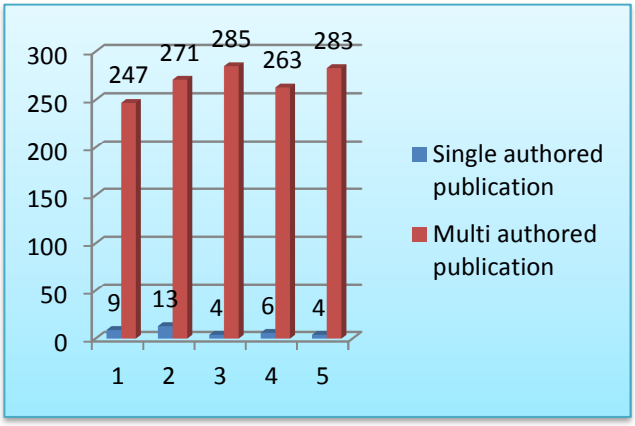

Figure 5.1: Year-Wise Publication Productivity and Collaboration Rate

It can be observed from Table No.5.1 & figure No. 5.1 that during 2010-2014 a total of 1385 Articles were published in the Pharmaceutical Research by researchers in various countries.

5.2 GEOGRAPHICAL DISTRIBUTION OF RESEARCH OUTPUT

Geographical distribution of research output means the article published from different countries**.** In political geography and international politics, a country is a political division of a geographical entity. Frequently, but not exclusively, a sovereign territory, the term is most commonly associated with the notions of both state and nation, and also with government.

Table 2: Country-Wise Distribution of Articles

Sr. No.	Name of the Country	publication	Percentage (%)	Rank
1	USA	2794	36.86	1
2	China	762	10.05	2
3	Japan	428	5.65	3
4	France	357	4.71	4
5	UK	350	4.62	5
6	Germany	342	4.51	6
7	Netherlands	314	4.14	7
8	Australia	229	3.02	8
9	Korea	221	2.92	9
10	Denmark	150	1.98	10
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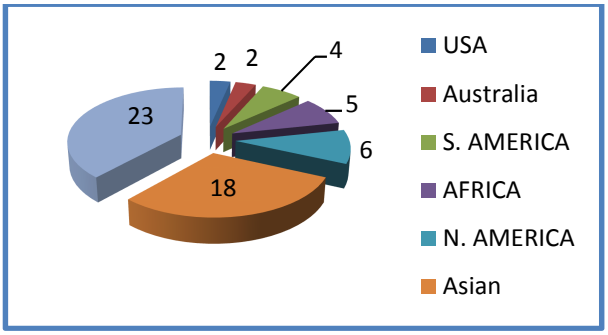

Figure 5.2: Country-Wise Distribution of Articles

It can be observed from Table No 5.2 and Figure No. 5.2 that, there were as many as 58 countries carrying out research and produced 1385 articles. Table no.2 provides ranked List of countries contributing to this field, the number of publications of each country and their share in percentages is the top producing country USA with 2794 publications (36.86) of the total output. Therefore, the hypothesis, **"USA is the high productive country" (Hypotheses No.2)** is valid. It can be stated that USA being the publishing country the output is more than other country.

5.3 AUTHORSHIP AND COLLABORATION TREND

Gupta, D.K.[(4)]Authorship is an observable phenomenon reflecting the contemporary scholarly practices clearly showing the communication, productivity and collaborative patterns and influences among researchers even though their quantities and qualities are not well understood.

Collaboration in research is said to have taken place when 2 or more persons work together on a scientific problem of project and effort, both physical and intellectual.

Table 3: Authorship and Collaboration Trend

Year	Single Author	Number of papers with various authorship									Total Publication	
	1	2	3	4	5	6	7	8	9	10	More Than Ten	
2010	9	36	35	39	38	35	30	19	6	4	5	256
2011	13	37	40	41	43	32	20	19	11	10	18	284
2012	4	28	33	36	51	41	26	30	13	13	14	289
2013	6	24	42	48	32	41	28	21	8	6	13	269
2014	4	14	44	38	40	37	36	24	18	15	17	287
Total	**36**	**139**	**194**	**202**	**204**	**186**	**140**	**113**	**56**	**48**	**67**	**1385**
%	**2.60**	**10.04**	**14.01**	**14.58**	**14.73**	**13.43**	**10.11**	**8.16**	**4.04**	**3.47**	**4.84**	**100.00**

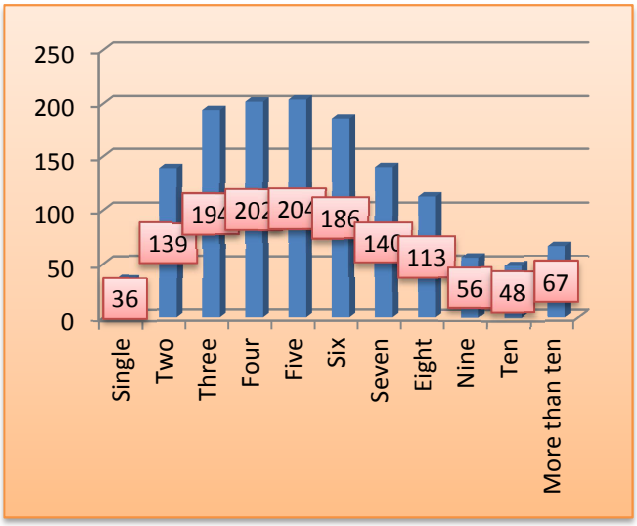

Figure No. 5.3: Authorship and Collaboration Trend

It can be observed from Table No.5.3 and Figure No.5.3 that, year-wise authorship and collaboration trend is given in table 3.Authorship trend is towards multiple-authored papers. Single authored papers accounted for **36 (2.60%)**. **Therefore, the hypothesis, "Authorship trend is towards multiple authored paper. (Hypothesis No.1) is valid.**

5.4 INTERNATIONAL COLLABORATION PATTERN OF ARTICLES

The International collaborative production of articles is the simultaneous action of many people who try to combine their ideas to make a new one. In fact "collaborative" is the process where two or more people work together toward a common goal and they don't required leadership.

Table 5.4: International Collaboration Pattern of Articles

Year	No. of Countries		Total No. of Publication
	Single	Collaboration	
2010	215	41	256
2011	235	49	284
2012	234	55	289
2013	219	50	269
2014	262	25	287
Total	**1165**	**220**	**1385**
%	**84.12**	**15.88**	**100**

The distribution of the collaboration of the various countries and their institutions respectively are given in the further table.

5.5 MOST PRODUCTIVE AUTHOR

An author is defined both as "the person who originates or gives existence to anything" and as "one who sets forth written statements" in the Oxford English Dictionary.[24].

Table No. 5.5: Most Productive Author

Sr. No.	Authors	Country	Publication	Rank
1	Wim Jiskoot	Netherlands	21	1
2	Wim E. Hennink	Netherlands	11	2
3	Christopher J. H. Porter	Australia	10	3

4	Jukka Rantanen	Denmark	10	3
5	Ram I. Mahato	USA	10	3
6	Younsoo Bae	USA	10	3
7	Daniela Traini	Australia	9	4
8	Donald E. Mager	USA	9	4
9	Hak-Kim Chan	Australia	9	4
10	Sean Ekins	USA	9	4
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It can be observed from Table No. 5.5that, the most productive authors are Wim Jiskoot (Netherlands) and Wim E. Hennink (Netherlands) who had the highest number (11) of the publication. Four Authors with 10 publications. Five Authors with 9 publications, Four Authors with 8 publications and twelve authors with 7 publication. Table gives a list of Authors appeared in the articles.

5.6 INSTITUTES WISE DISTRIBUTION OF ARTICLES PUBLISHED

Institution is a society or organization for the promotion of science, education etc. [5] .An institute is a permanent organizational body created for a certain purpose. Often it is a research organization (research institution) created to do research on specific topics. An institute can also be a professional body. In some countries institutes can be part of a university or other institution of higher education, either as a group of departments or an autonomous educational institution without a classic full university status such as a University Institute.

Table 5.6: Institutes wise distribution of articles

Sr. No.	**Name of the Institution**	**No. of Publication**	**Rank**
1	US Pharmacopeial Convention, Rockville, Maryland, 20852, USA	21	1
2	Case Center for Imaging Research, Case Western Reserve University, Cleveland, Ohio, USA	18	2
3	Department of Pharmacy, Faculty of Health and Medical Sciences, University of Copenhagen, Universitetsparken 2, 2100, Copenhagen Ø, Denmark	17	3
4	Faculty of Pharmaceutical Sciences, Josai University, 1-1 Keyakidai, Sakado, Saitama, 350-0295, Japan	17	3

5	Key Laboratory of Advanced Technologies of Materials Ministry of Education of China, School of Materials Science & Engineering, Southwest Jiaotong University, Chengdu, 610031, People's Republic of China	17	3
6	School of Pharmacy, University of Eastern Finland, Kuopio, Finland	17	3
7	Biopharmaceutical Development Program, SAIC-Frederick, Inc., National Cancer Institute at Frederick, Frederick, Maryland, 21702, USA	16	4
8	Drug Delivery, Disposition and Dynamics Monash Institute of Pharmaceutical Sciences, Monash University, 381 Royal Parade, Parkville, Victoria, 3052, Australia	14	5
9	National Key Laboratory of Biochemical Engineering PLA Key Laboratory of Biopharmaceutical Production & Formulation Engineering, Institute of Process Engineering Chinese Academy of Sciences, Bei-Er-Jie No.1, Zhong-Guan-Cun, Haidian District, Beijing, 100190, People's Republic of China	14	5
10	State Key Laboratory of Natural Medicines, China Pharmaceutical University, Nanjing, 210009, China	14	5
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It can be observed from Table No. 5.6 that, there were 7581 organizations involved in research activity. The organizations that have contributed in the publication during 2010-2014. US Pharmacopeias Convention, Rockville, Maryland, 20852, USA, 21 publication by one institutions, Case Center for Imaging Research, Case Western Reserve University, Cleveland, Ohio, USA the list with 18 publication followed by one institutions. Four institutions with 17 publications, One institutions with 16 publications, 3 institutions with 14 publications, 3 institutions with 13 publications, 9 institutions with 12 publications, five institution with 11 Publication, 11 institution with 10 Publication, 17 institution with 9 Publication, 35 institution with 8 Publication, 58 institution with 7 publication etc. and 1289 institutions with Single publication. Therefore the hypothesis **"Majority of the affiliated institution are from USA (Hypothesis No.3) is valid".**

5.7 DISTRIBUTION OF LITERATURE IN VARIOUS CHANNELS OF COMMUNICATION

Channel, in communications, refers to the medium used to convey information from a sender (or transmitter) to a receiver. Researchers communicated their publication through variety of communication channels.

Table 5.7: Distribution of literature in various Channels of Communication

Channels of Communication	No. of Publication	Percentage
research Paper	1178	85.05
Expert Review	101	7.29
Perspective	30	2.17
Commentary	29	2.09
Editorial	20	1.44
Erratum	16	1.16
Original Paper	3	0.22
Letter to the Editor	3	0.22
Review	2	0.14
Meeting Report	2	0.14
Dedication	1	0.07
Total	**1385**	**100.00**

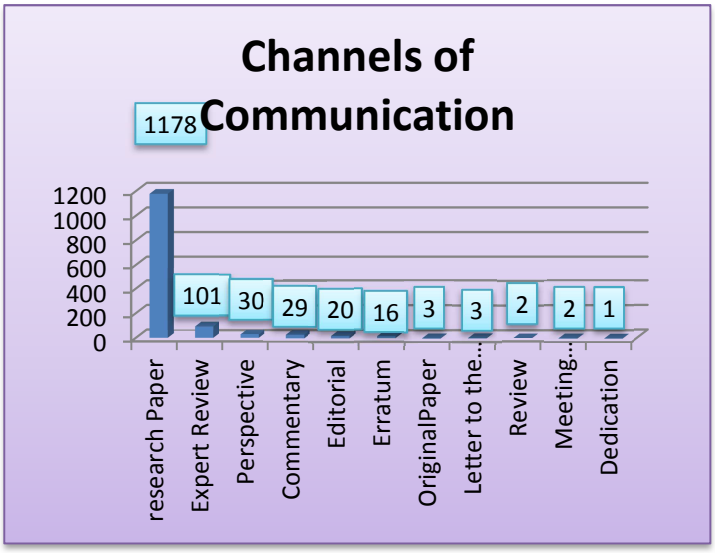

Figure No: 5.7 Distribution of literature in various Channels of Communication

It can be observed from table no. 5.7 and Figure No.5.7 that, 1178(85.05%) of the Literature was published in Research paper followed by Expert Review 101(7.29%), Perspective 30(2.17%), Commentary 29(2.09%), Editorial 20(1.44%), Erratum 16(1.16%), Original Paper and Letter to the Editor 3(0.22%), Review and Meeting Report 2(0.14%), and Dedication 1(0.07%). The total content of Pharmaceutical Research that is Pharmaceutical steps recovery, research paper, Editorial, expert review, erratum, etc. is analyzed.3

5.8 DISTRIBUTION OF KEYWORDS

"A word occouring natural language text of documents or its surrogate that is considered significant for indexing and information retrieval". [(2)]

Keywords are the words that are used to reveal the internal structure of an author's reasoning. Keywords are one of the best scientometric indicators to understand the grasp instantaneously the thought content of the articles and to find out the growth of the subject field. By analyzing the keywords appeared either on the title or article will help in knowing in which direction the knowledge grows.

"Keyword is a word that succinctly and accurately describes the subject discussed in a document". [6]

Table No. 5.8: Keywords

Sr. No.	Keyword	Frequency	Percentage (%)	Rank
1	drug delivery	70	1.03	1
2	nano-particles	55	0.81	2
3	pharmacokinetics	47	0.69	3
4	controlled release	28	0.41	4
5	siRNA	26	0.38	5
6	dissolution	24	0.35	6
7	paclitaxel	22	0.32	7
8	bioavailability	21	0.31	8
9	blood–brain barrier	21	0.31	8
10	cancer	21	0.31	8
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It can be observed from Table No. 5.8 that, the high frequency keywords were drug Delivery (70), Nano-particles (55), pharmacokinetics (47), Controlled release (28), siRNA, (26), Dissolution (24), and Paclitaxel (22) Table gives a list of keywords appeared in the articles.

6. CONCLUSION:

Pharmaceutical Research, an official journal of the American Association of Pharmaceutical Scientists, is committed to publishing novel research that is mechanism-based, hypothesis-driven and addresses significant issues in drug discovery, development and regulation. Current areas of interest include, but are not limited to: pre)formulation engineering and processing, computational biopharmaceutics,drug delivery and targeting, molecular biopharmaceutics and drug disposition (including cellular and molecular pharmacology),pharmacokinetics, pharmacodynamics and pharmacogenetics.

Research may involve nonclinical and clinical studies, and utilize both in vitro and in vivo approaches. Studies on small drug molecules, pharmaceutical solid materials (including biomaterials, polymers and nanoparticles) biotechnology products (including genes, peptides, proteins and vaccines), and genetically engineered cells are welcome.

The Collaboration rates of articles published per year were 100. The highest numbers of Articles (289) were produced in 2012 respectively. There were as many as 58 countries carrying out research and produced 1385 articles.

USA is the top producing country with 2794 publications (36.86) of the total output. Authorship trend is towards multiple-authored papers. Single authored papers accounted for 2.60 percentages. Out of 1385 articles, 220 articles (15.88%) are written in collaboration with International Institutions. The collaboration is observed with two countries and three countries. The most productive authors are Wim Jiskoot (Netherlands) and Wim E. Hennink (Netherlands) who had the highest number (11) of the publication. There were 7581 organizations involved in research activity. The organizations that have contributed in the publication during 2010-2014, US Pharmacopeias Convention, Rockville, Maryland, 20852, USA, 21 publication. Researchers communicated their publication through variety of communication channels, the highest communication channels 85.05%. of the Literature was published in Research papers followed by Expert Review 101(7.29%), The total content of Pharmaceutical Research that is Pharmaceutical steps recovery, research paper, Editorial, expert review, erratum, etc Keywords are one of the best scientometric indicators to understand the grasp instantaneously the thought content of the articles and to find out the growth of the subject field. By analyzing the keywords appeared either on the title or article will help in knowing in which direction the knowledge grows .The high frequency keywords were drug Delivery (70), Nano-particles (55), pharmacokinetics (47), Controlled release (28), siRNA, (26), Dissolution (24), and Paclitaxel (22) Table gives a list of keywords appeared in the articles.

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