Winter 3-16-2021

A Scientometrics analysis of Ovarian Cancer Research during 2010 to 2019: with special reference to South Asian contribution

Kusumita Jamatia

MITHU ANJALI GAYAN

A Scientometrics analysis of Ovarian Cancer Research during 2010 to 2019: with special reference to South Asian contribution

KUSUMITA JAMATIA
MLIS

Dr. Mithu Anjali Gayan
Assistant Professor
Dept. of Library and Information Science
Tripura University

Abstract:

A scientometrics analysis of Ovarian cancer research during 2010 to 2019 is performed in this study. It is an attempt to find out the various scientometrics indicators such as: type of document wise distribution, authorship pattern, year wise publication, Co-occurrence of keyword. A total of 927 bibliographic records were collected from web of science database and as a data source it has been analyzed using MS excel and VOS viewer software. Kumar, S from University of Birmingham is found to be the most productive author. Multi - authorship is found to be dominant in this area of research. South Asia countries have been chosen as an area of the study and the countries that make up south Asia are Sri Lanka, Pakistan, Bangladesh, Nepal, India, Bhutan, Afghanistan and Maldives.

Keywords: Ovarian Cancer, Scientometrics, Neoplasms, Web of Science (wos) and VOSviewer.

Introduction:

Metrics are quantitative measurements which help to evaluate research outputs. Metrics studies help in understanding the productivity and growth of a discipline and Assist in design and development appropriate policies for research and studies. Ovarian Cancer is a disease which used to occur in women's bodies; mostly ovarian cancer develops after menopause. Ovarian cancers should be made more aware to the society and all over the world wide so that when its time it can be prevented from the risk. Medically also it should be more advance like the other disease and save the life of the women's who are dying every year in causes of the ovarian cancer disease. Through NGO's, workshops the awareness programs should be conducted and spread about the disease. The current study tried to assess the research productivity of South Asian countries in the field of Ovarian Cancer research.

Literature Review:

(Serenko, Bontis ,Booker, Sadeddin and Hardie, 2010) performed a scientometric analysis of Knowledge Management and intellectual capital academic literature for the time period 1994-2008. For this study, the researchers considered 2,175 articles published in 11 major KM/IC peer-reviewed journals. The study revealed that 3,109 unique authors published 2175

articles; for overall 1994-2008 period, each article was written by 1.94 authors and for the period of 1994-2004 and 2005-2008 periods. **(**Waila, Singh and Singh, 2016) analyzed Research in Recommender Systems. The dataset for the study of 2451 records were downloaded from Web of Science database. The research output data was analyzed on recommender systems during 1991 to 2015 indexed from web of knowledge. The 'Journal of Machine Learning Research' tops in terms of most cited source in terms of total citation with 3221 total citations. **(**Esfahani,Tavasoli and Jabbarzadeh, 2019) explored Big data and Social media a scientometrics study which is the purpose of the research is to find out the status and to evaluate the scientific studies for the effect of social networks on big data and usage of big data for modeling the social networks user behavior. The research was studied using Scopus database as a primary search engine and covers 2000 of highly cited articles over the period during 2012 to 2019. Among all the cited articles united states have received the highest citations 7,548 followed by United Kingdom 588 and china with 543 citations. (Fang,Yin and wu, 2017) proposed the study on Climate change and tourism using CiteSpace. It is the interaction between climate change and tourism which has been one of the most critical and dynamic areas in the field of sustainable tourism. The data which has been analyzed from 976 academic publications from 1990 to 2015 related to climate change and tourism is presented to characterize the intellectual landscape by identifying and visualizing the evaluation of the collaboration network and emerging trends. The institutions which came into collaboration network consisted of 252 institutions and 98 collaboration links between 1990 and 2015.The most productive authors and institutions in the subject areas are like Australia, USA, Canada, New Zealand and European countries. (Manimegalai and Ravi, 2014) explored the fashion technology research it study 44 Years of the research publications in the field of fashion technology during the period of 1970 to 2013, the articles analyzed result is 1,52,681 . It also examines year wise distribution of article, country wise distribution, languages distribution and relative growth rate, high productive institutions etc. (Paul and Deoghuria, 2014) analyzed Indian Journal of Physics which is a User reviewed journals in the field of science, technology and medical (STM). The data has been collected for ten years from 2004 to 2013. There is a steady growth in science technology and medical journal in publishing industry. The impact factor over the last few years and for the year of 2012 the impact factor of Indian Journal of Physics is 1.785 which is the highest for any physics journal published from India and other well know physics journals published from USA and European countries. **(**Bruggmann, Pulch, and Klingelhofer….etal, 2017) explored ovarian cancer mapping of the global research architecture. During 115 years from 1990 to 2014 total of 23,378 original research articles were published in the WoS. The USA had the highest activity of Ovarian Cancer research with a total number of 9312 publications. **(**Vakili and Rasolabadi, 2016)

analyzed the Ovarian Cancer research in Iran the publications output during two decades (1996-2015) in Scopus. The aim of this article is to analyze one of the important causes of women 'Ovarian Cancer'. The data retrieved from Scopus citation database. Total numbers of papers from 1996 to 2015 were 73384 papers. A total number of 92 different countries with more than 10 papers contributed to the literature on ovarian cancer during the period. From 2010 to 2015 the total number 94835 citations were received 73384 publications and the achieved H- index for ovarian cancer research was 88. (Singh, Datta and Handa, 2019) performed dynamics research in Indian of fisheries and aquaculture. The purpose of this article is that the dynamics of scientific output in fisheries and aquaculture in Indian during the year of 2007 to 2016 which was very much productive. The average number of citations to articles also decreased (except year 2012), earning 15.87 citations during 2007 to 1.17 citations during 2016. The string search retrieved 11,012 results. (Pradhan and Ramesh, 2018) proposed the Scientomatric analysis of research publications of six Indian Institutes of technology. During 2006 to 2015 the six IITs published 72,940 papers. The six Indian institutes of Technology are IIT Delhi, IIT Bombay, IIT Kharagpur, IIT Madras, IIT Kanpur and IIT Madras and IIT Roorkee. Among all the six IITs, IITB published highest (29.89%) papers as conference papers followed by IITD (27.59%) and the lowest number of papers was published by IITR with (12.6%) of the output. **(**Ramin, Gharebaghi and Heidary, 2015) analyzed the Mapping of Scientific Articles on Diabetic Retinopathy. In this research the duration of the collection of the articles is from 1993 to 2013. The total number of articles which were collected is 3,228 on Diabetic Retinopathy (DR), and this paper is also drafted by 11,591 authors, 2,771 institutions and 93 countries. The articles were also published in 547 journals in 10 languages. (Suradkar, 2016) performed the international journal of Skin therapy letter. During the period of 2010 to 2014, the total result of articles 416. It is based on 5 volumes, 28 issued and 2570 citations 418 articles in E-journal skin therapy. (Umamaheswari, Kalaiselvan and Thilakar, 2014) proposed the study of Agricultural Journal. The during the period of 2008 to 2012, maximum number of papers was published in 'Indian Journal of Agronomy' is 74 research papers published in 2012 and minimum number of papers was published 55 research papers in 2008. (Padmamma and walmiki, 2016) analyzed the articles contributions to web of science on uterus cancer. The data has been collected from web of science during the period of 2006 to 2016 and the total number of records 3,197 on uterus cancer. Collaboration of Research of authorship by Single and two authors from 3197 articles, 4.47% and 8.38% articles have been contributed. (Vanathi, Saravanan and Nagarajan, 2015) performed Scientometric Analysis of Chemistry Research Output in Selected Universities of Tamil Nadu. The Data was collected from the web of science from 1989 to 2014. The total number publications were 4033 in the duration of 26 years, highest

number of 417 papers was published in the year 2014. Dr .R. Ranganathan is the most productive author with 134 publications. Among the four universities the highest numbers of publications were published by University of Madras with 1315 records,(32.60%) of the total publications. (Marisha, 2019) explored about the current science. Duration of the publications of the journal was 28year from 1990 to 2017. The total data was collected from WoS of 18,897 records, of which 50.78% are articles (9596), 18.81% letters (3555), 12.64% editorial material (2388), 5.99% news item (1132), 3.88% review (734), 3.63% notes (685) and 2.40% are bibliographic items (454). The top 10 countries in terms of contributing output are like India, United States, United Kingdom, Germany and China etc. (Sadik, 2018) performed Scientometric Analysis of Dentistry Research. During the period of 2008 to 2017 the total publication published was 11,350. The top 12 most productive countries contributed globally 5.36% to 52.17%. The highest number of articles, 1714 (15.10%) were published in the year 2016. (Hadagali, Hiremath, Gourikeremath, and Bulla, 2019) analyzed the research of Materials Science. During the period of 2002 to 2016 study uses Science Citation Index of ISI Thomson Reuters. The total number of publication was 12,42,775. The research indicates that China was ranked topped with 2,87,736 publications, followed by the USA with 2,17,422 publications, Japan with 1,02,696 publications, Germany with 84,076 publications, South Korea with 80,078 publications ranked second to fifth respectively. India ranked sixth with 65,234 publications. (Davarpanah, 2012) analysed Nuclear Science and Technology Research Output from Iran. The data have been collected from the Science Citation Index Expanded (SCIE) for the years 1990 to 2010. A total of 1071 records were downloaded. Only one paper was published in 1990 the least productive of all years of research. The most productive year was 2010, when 211 papers were published. The highest growth rate in 2007 is (56.76%) and the lowest growth rate in 2010 is (6.03%). (Ali and Adithya, 2018) analyzed the scientomatric analysis of world biodiversity literature, it presents the publications indexed in the web of science. The data was collected during the period from 1989 to 2016. The total number publication was 154654. The top 10 institutions during the period of 1989 to 2016 followed by 936 publications from INRA, 904 publications by Russian academy of science, 833 publications by CAIC, 779 publications by Universidad Nacional Autonoma, 696 publications by University of Queensland, 691 publications by University of Sao Paulo, 664 publications by Swedish University of Agricultural Sciences and 626 publications by University of Helsinki.

Objectives of the study:

1. To identify and analyze the country-wise contribution of research output during 2010 to 2019.

2. To evaluate the productivity and connectivity of countries.
3. To identify the type of document productivity.
4. To find out the authorship pattern

Methodology:

The dataset for the current study is retrieved from Web of Science database by using the search query **TS=**(''cancer of ovary''OR''ovarian cancer'' OR ''cancer of the ovary''OR ''Neoplasms, Ovarian ''OR''Ovary Cancer ''OR''Ovary Neoplasms'') **Refined by: PUBLICATION YEARS:** (2012 OR 2011 OR 2019 OR 2010 OR 2018 OR 2017 OR 2016 OR 2015 OR 2014) AND **COUNTRIES/REGIONS:** (BANGLADESH OR PAKISTAN OR INDIA OR SRI LANKA OR NEPAL)**.** There was 928 documents were found during 2010 to 2019. The synonyms were searched from MeSH.

For the research study articles, review document, Editorial material, Biographical, letter, News Item, etc. MSExecl and VOSviewer software were used for analysis and visualizing the collected data.

Formulas used

a. Degree of collaboration (DC)

(Subramanyam, 1980) propounded the DC, a measure to calculate the proportion of single and multi-author papers and to interpret it as a degree. According to Subramanyam,

DC=Nm/(Ns+Nm)

Where,

Nm = the number of multi-authored papers

Ns = the number of single author papers

DC varies from 0 when all the papers have a single author to 1 when all the papers have more than one author. It can be easily calculated and can also be easily interpreted.

b. Collaborative Coefficient (CC)

Ajiferuke et al. (1988) put forwarded the formula for collaboration coefficient (CC) as

$$CC = 1 - \frac{\sum_{j=1}^{A}\left(\frac{1}{j}\right)f_j}{N}$$

Fj denotes the number of j authored research papers

N denotes total number of research papers published

k is the greatest number of authors per paper

It is detected by Ajiferuke, that the value of CC will be zero when single-authored papers dominant. This implication shows that higher the value of CC, means higher the probability of multi- authored papers.

c. Collaboration Index (CI)

Collaboration Index has been calculated by using the formula as given by Lawani (1980). The Collaboration Index (CI) is the simplest index presently used to explore the literature, which is to be interpreted the mean number of authors per paper.

$$CI = \frac{\sum_{j=1}^{A} jf_j}{N}$$

Where,

f_j is the number of J authored papers published in a discipline during a certain period of time

N is the total number of research papers published in a discipline during a certain period of time.

Data Analysis and Interpretation:

Table 1 shows the type of document wise distribution of the sample in a chronological order which have been collected from web of science. Out of 927 documents, Article is found to be the most dominant type of document published in the area of **Ovarian Cancer with** 640 (69.04%), followed by Review with 157 (16.94%) and Editorial material with 97 (10.46) number of documents. It is seen from the data that there is a growing trend in the number of articles over the years. Similar trends are also visible in case of Meeting abstracts and Reviews.

Table 1: Type of document wise distribution

Sl.No.	Period	Article	Correction	Editorial Material	Letter	Meeting Abstract	Review
1	2010	36 (3.88)		1(0.11)	2 (0.22)	3 (0.32)	8 (0.86)
2	2011	31 (3.34)		2 (0.22)	2 (0.22)	4 (0.43)	3 (0.32)
3	2012	49 (5.29)		1(0.11)	5 (0.54)	4 (0.43)	
4	2013	47 (5.07)		3 (0.32)		12 (1.29)	9 (0.97)
5	2014	73 (7.87)		1(0.11)		11 (1.19)	16 (1.73)
6	2015	77 (8.31)	1 (0.11)	1(0.11)	4 (0.43)	10 1.08	18 (1.94)
7	2016	86 (9.28)		2 (0.22)		17 1.83	23 (2.48)
8	2017	73 (7.87)		1(0.11)	1(0.11)	7 (0.76)	23 (2.48)
9	2018	87 (9.39)		1(0.11)		15 (1.62)	32 (3.45)
10	2019	81				14 (1.51)	25

		8.74)					(2.70)
11	Year not found						
Total		**640 (69.04)**	**1 (0.11)**	**13 (1.40)**	**14 (1.51)**	**97 (10.46)**	**157 (16.94)**

Authorship pattern in the area of Ovarian Cancer research is explained in the table 2. The data is organized chronologically. Number of authors in the area varies from 1 to 337. Over the years the share of single authored papers varies from 0.11 % to 054% of the total sample. An overall increase in number of documents in the area is noticed from the data. It is also found that in this area only 51 (5.50%) documents are found to be authored by single authors and remaining 876(94.50%) documents are authored by multiple authors. For the year 2012, no record is found for single authored documents.

Table 2: Authorship Pattern

	Number of authors															
Period	**One (%)**	**Two (%)**	**Three (%)**	**Four (%)**	**Five (%)**	**Six (%)**	**Seven (%)**	**Eight (%)**	**Nine (%)**	**Ten (%)**	**Eleven to twenty (%)**	**Twenty -one to Thirty (%)**	**Thirty to Forty (%)**	**Forty to Hundred (%)**	**more than 100 (%)**	**Total**
2010	3 (0.32)	3 (0.32)	6 (0.65)	7 (0.76)	8 (0.86)	4 (0.43)	8 (0.86)	3 (0.32)	1 (0.11)	0 (0.00)	6 (0.65)	1 (0.11)	1 (0.11)	0 (0.00)	0 (0.00)	51 (5.50)
2011	1 (0.11)	3 (0.32)	6 (0.65)	14 (1.51)	5 (0.54)	3 (0.32)	2 (0.22)	2 (0.22)	1 (0.11)	1 (0.11)	3 (0.32)	0	0 (0.00)	1 (0.11)	0 (0.00)	42 (4.53)
2012	0 (0.00)	1 (0.11)	9 (0.97)	9 (0.97)	9 (0.97)	12 (1.29)	7 (0.76)	2 (0.22)	2 (0.22)	2 (0.22)	4 (0.43)	1 (0.11)	0 (0.00)	0 (0.00)	1 (0.11)	59 (6.36)
2013	2 (0.22)	13 (1.40)	9 (0.97)	5 (0.54)	10 (1.08)	12 (1.29)	8 (0.86)	3 (0.32)	4 0.43	0 (0.00)	4 (0.43)	1 (0.11)	0 (0.00)	0 (0.00)	0 (0.00)	71 (7.66)
2014	3 (0.32)	13 (1.40)	8 (0.86)	16 (1.73)	15 (1.62)	14 (1.51)	8 (0.86)	6 (0.65)	5 (0.54)	4 (0.43)	8 (0.86)	1 (0.11)	0 (0.00)	0 (0.00)	0 (0.00)	101 (10.90)
2015	3 (0.32)	12 (1.29)	15 (1.62)	15 (1.62)	10 (1.08)	14 (1.51)	11 (1.19)	6 (0.65)	1 (0.11)	5 (0.54)	16 (1.73)	2 (0.22)	1 (0.11)	0 (0.00)	0 (0.00)	111 (11.97)
2016	5 (0.54)	8 (0.86)	11 (1.19)	19 (2.05)	18 (1.94)	14 (1.51)	9 (0.97)	16 (1.73)	6 (0.65)	7 (0.76)	13 (1.40)	1 (0.11)	0 (0.00)	0 (0.00)	1 (0.11)	128 (13.81)
2017	2 (0.22)	9 (0.97)	7 (0.76)	17 (1.83)	11 (1.19)	17 (1.83)	9 (0.97)	12 (1.29)	5 (0.54)	7 (0.76)	8 (0.86)	0 (0.00)	1 (0.11)	0 (0.00)	0 (0.00)	105 (11.33)
2018	1 (0.11)	9 (0.97)	22 (2.37)	24 (2.59)	13 (1.40)	14 (1.51)	14 1.51	5 (0.54)	5 (0.54)	5 (0.54)	19 2.05	2 (0.22)	1 (0.11)	0 (0.00)	1 (0.11)	135 14.56
2019	3 (0.32)	9 (0.97)	13 (1.40)	16 (1.73)	19 (2.05)	20 (2.16)	12 (1.29)	3 (0.32)	7 (0.76)	6 (0.65)	10 1.08	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.11)	119 (12.84)
year not found				3 (0.32)					1 (0.11)		1 (0.11)		0 (0.00)	0 (0.00)		5 (0.54)
Total																927

Table 3 describes the collaboration pattern among the authors in the field of Ovarian Cancer Research. To show the Collaboration Pattern the formula DC CC and CI are used.

To calculate the DC formula “a” of methodology is used. It is found from the dataset that DC was minimum at 0.94 in 2010 and maximum at 1.00 in 2012 which means that there was no single authored document recorded in that year. The pattern of DC is in increasing trend from top to bottom which shows the trend towards multi authorship. The DC for each year is found to be equal to or more than 0.94 which shows highly collaborative research trend in this research area.

To calculate CC, the formula “b” mentioned in methodology section is used. The value of CC will be zero when single-authored papers dominate. This implication shows that higher the value of CC means higher the possibility of multi- authored papers in a discipline. In this study CC was lowest in 2010 with the CC value 0.747 and was highest in 2012 with the value 0.804.

Table 3: Collaboration Pattern

SL. No.	Period	DC	CC	CI
1	2010	0.94	0.747	5.88
2	2011	0.98	0.750	6.14
3	2012	1.00	0.804	7.93
4	2013	0.97	0.731	5.07
5	2014	0.97	0.752	5.59
6	2015	0.97	0.763	6.41
7	2016	0.96	0.773	8.39
8	2017	0.98	0.783	6.27
9	2018	0.99	0.785	8.03
10	2019	0.98	0.773	5.88

CI is used to find out mean number of authors per paper. It cannot be interpreted as a degree because it has no upper-value limit. To calculate CI, the formula “c” mentioned in methodology section is used. CI was lowest for the year 2010 and 2019 and was highest for the year 2016.

It can be summarized from the above arguments that very high collaborative research activities are noticed in Ovarian Cancer Literature.

Table 4 explains top 20

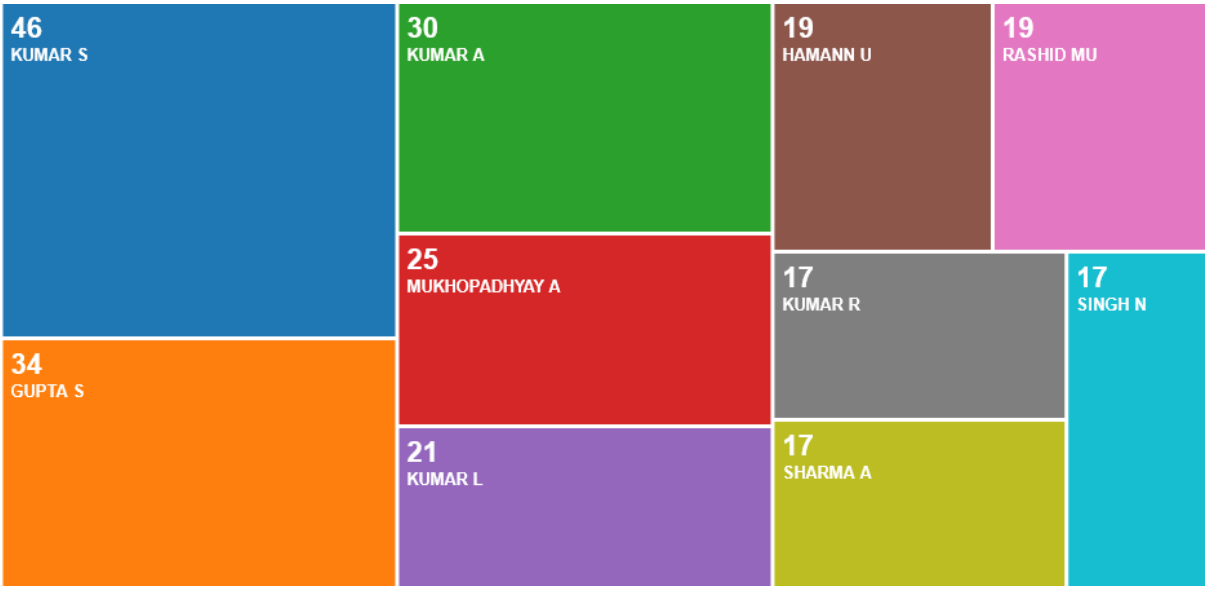

Fig1: To 10 most productive authors in the area of Ovarian Cancer research

Figure 1 shows that Kumar, S from University of Birmingham is found to be the most productive author with 46 documents followed by Gupta, Swati from Amity university produced 34 documents; Kumar , Ajay from Jaypee Inst Informat Technol produced 30documents; Mukhopadhyay, Asima from Chittaranjan Natl Canc Inst produced 25 documenttts and Kumar, Lalit from All India Institute of Medical Sciences (AIIMS), New Delhi produced 21 documents.

Table 4 portrays the top 20 most productive institutes in the area of Ovarian Cancer research. All India Institute of Medical Science, New Delhi is found to be the most productive institute with 60 documents and 2007 citations followed by Tata Medical Center with 29 documents having received 33 citations and University of Delhi with 17 documents and 155 citations.

Table 4: Top 20 most productive institutes in the field of Ovarian Cancer

Rank	Organization	Documents	Citations	total link strength
1	All India Institute of Medical Science, New Delhi	60	2007	22
2	Tata Medical Center	29	33	19
3	University of Delhi	17	155	16
4	Tata memorial hospital	34	650	15
5	Indian Inst. Technology	26	518	14
6	central drug research institute	10	158	12
7	Academy of Scientific and Innovative Research (AcSIR)	9	42	10

8	Harvard University	7	580	10
9	Indian Institute of Chemical Biology	10	133	10
10	Manipal University	9	126	10
11	Shaukat Khanum Memorial Cancer Hospital and Research Centre	7	37	10
12	CSIR	17	287	9
13	Indian Inst. Chemical Technology	11	147	9
14	Rajiv Gandhi Centre for Biotechnology	12	290	9
15	Wayne state university	8	199	9
16	Dr hari singh gour vishwavidyalaya	7	95	8
17	German Cancer Research Center	12	75	8
18	Newcastle university	5	9	8
19	University of Malaya	7	74	8
20	University of Pune	6	132	8

The threshold frequency was taken as 5 for organizations and 0 for number of citation received by organizations as derived by VOSviewer. Out of 1418 organisations, 79 met the threshold frequency and out of that 4 organisations did not collaborate with others. So, all 74 items were divided into 11 clusters and all the clusters are assigned different colors by the software**.**

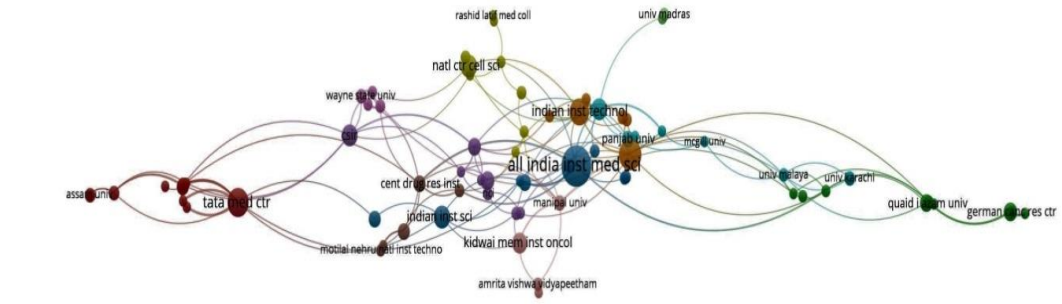

Figure 2: Collaboration network of all 74 organizations

In figure 2 each note represents organization's productivity and the link between the organizations denotes the collaboration established through the authorship in the articles. The highly productive organizations in terms of publication and productivity are All india inst med sci (publication=60, citation=2007) followed by Tata med ctr (publication=29, citation=33) University of Delhi (publication=17, citation=155).

In table 5 the top 20 most collaborating countries with India are found to be USA, Turkey, Taiwan, Switzerland, Sweden, Sri Lanka, Spain, South Korea, South Africa, Singapore, Scotland, Saudi Arabia, Poland, Peoples r china, Pakistan, Netherlands, Nepal, Malaysia, Japan and Italy who all collaborated with India . USA produced the highest product of 169 documents 4285 citations, followed by Pakistan 111 documents 1093 citations, Switzerland 12 documents 1519 citations and so on.

Table 5: Top 20 countries collaborating with India

Sl.	Country	Documents	Citations	total link strength
1	USA	169	4285	306
2	Turkey	5	30	15
3	Taiwan	13	154	43
4	Switzerland	12	1519	37
5	Sweden	5	305	32
6	Sri lanka	10	126	7

7	Spain	6	278	51
8	South korea	15	190	49
9	South Africa	5	26	18
10	Singapore	11	113	34
11	Scotland	7	58	37
12	Saudi Arabia	22	258	37
13	Poland	6	47	34
14	Peoples r china	23	293	70
15	Pakistan	111	1093	122
16	Netherlands	7	272	55
17	Nepal	5	13	6
18	Malaysia	17	243	64
19	Japan	16	99	50
20	Italy	26	478	116

The threshold frequency was taken as 5 for countries and 0 for number of citation received by countries as derived by VOSviewer. Out of 69 countries, 33 met the threshold frequency.

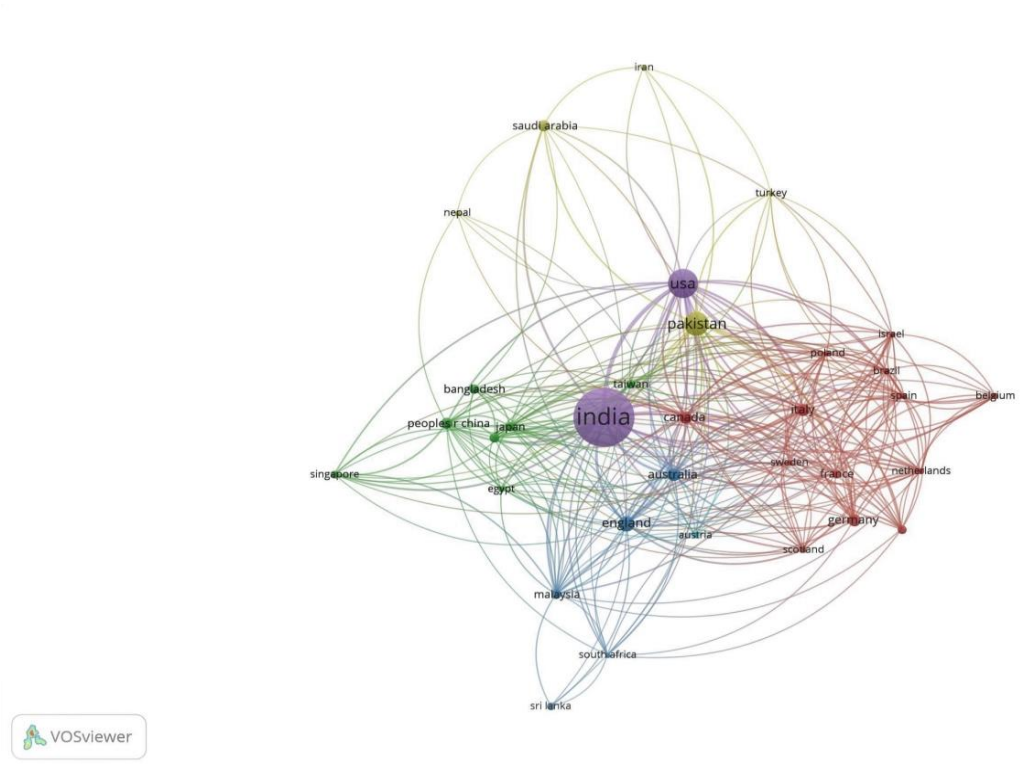

Figure 3: Collaboration on network of all 69 countries

Each note represents countries productivity and the link between the countries denotes the collaboration established through the authorship in the article. The highly productive countries in terms of publication and productivity are USA (publication= 169, citation =4285) followed by 33 items were divided into 6 cluster are assigned different colors by the software.

Table 6: Top 20 Co-occurrence keyword

Sl.no.	Rank	Keyword	Occurrences	Total link strength

1	1	ovarian-cancer	307	1619
2	2	ovarian cancer	147	832
3	3	breast-cancer	115	688
4	4	Expression	111	664
5	5	Apoptosis	88	612
6	6	Cancer	80	443
7	7	Carcinoma	73	396
8	8	in-vitro	68	392
9	9	breast cancer	58	383
10	10	Cells	52	330
11	11	Chemotherapy	50	313
12	12	Growth	44	278
13	13	Risk	44	274
14	14	gene-expression	40	255
15	15	Cytotoxicity	39	245
16	16	prostate-cancer	39	243
17	17	Protein	38	240
18	18	drug-delivery	36	235
19	19	lung-cancer	35	226
20	20	Paclitaxel	35	220

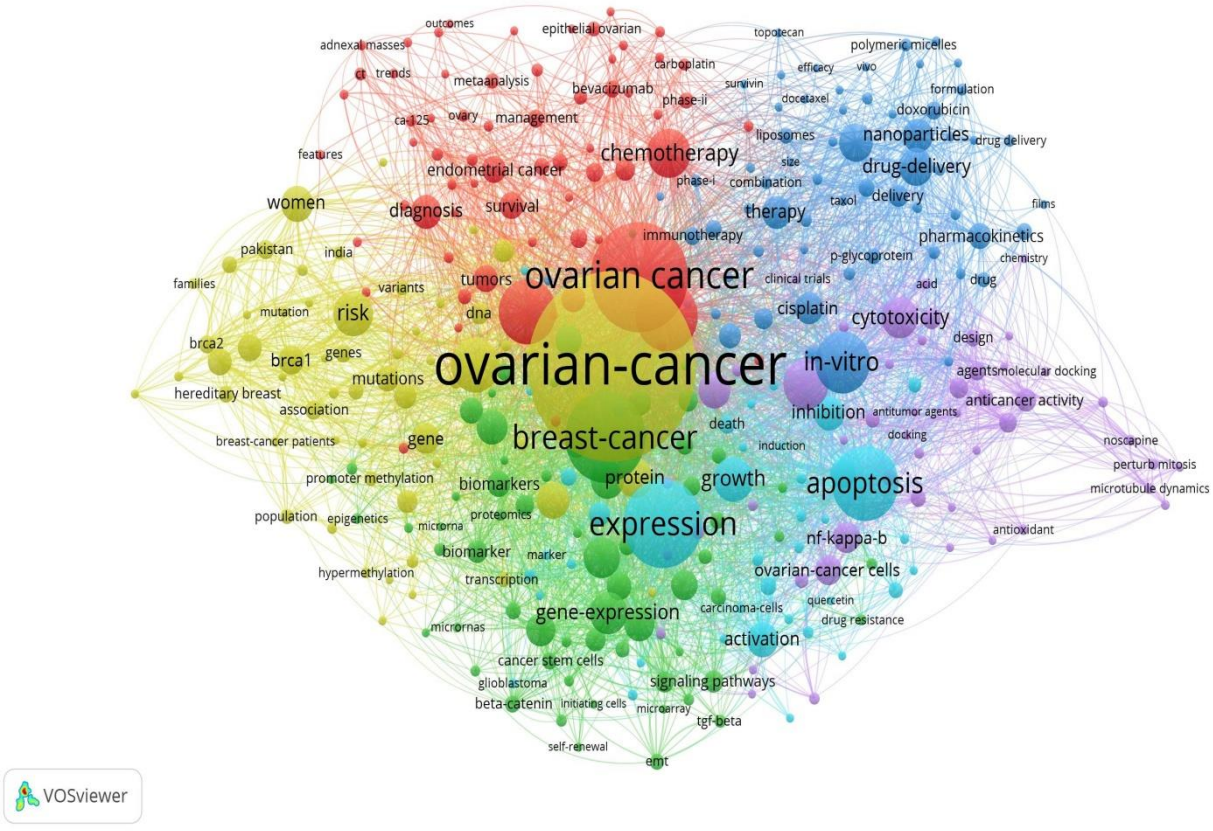

Figure 4: Keyword Co-occurrence

The figure 4 displays the Co-occurrence of Keyword networks. The threshold frequency was taken as 5 and minimum number of citation as 0 from VOSviewer. Out of 4857 keywords,

345 meet the threshold frequency. Followed by 345 items and 6 cluster are assigned different colours by the software. Ovarian-cancer is the most use keyword with the frequency of 307 and total link strength is 1619 followed by ovarian cancer 147 total link strength 832, breast-cancer occurrence 115 and total link strength 688.

Discussion:

The study is analyzed to show that the total number of publications in the Ovarian cancer research was published during the period of 2010 to 2019 in the South Asia is 927 and the highest number of year wise was 2018 with 135 (14.55%) publications. The highly productive organization is All india inst med sci with publication=60 and citation=2007. USA is the highest collaborating country with India with 169 documents having 4285 citations. Co-occurrence of Keyword is 4857 out of which Ovarian-cancer is the most use keyword with the frequency of 307 and total link strength is 1619 followed by ovarian cancer 147 total link strength 832, breast-cancer occurrence 115 and total link strength 688.

Conclusion:

In the research study on ovarian cancer research during 2010 to 2019: a scientometric analysis. The quantity and scientific recognition of publications related to ovarian cancer is increasing continuously. In the Whole worldwide the researchers are collaborating with the other authors to exchange epidemiologic data, resources and knowledge to be more stronger in the future and successfully reduce the global burden related to ovarian cancer. Ovarian cancer is the most serious gynecological tumor in women bodies in all over the world. It is still the fouth cause of dead by ovarian cancer all over the world. Although the treatment on ovarian cancer is developing but in whom the advance disease is still present they mostly have more than the other patients.

References:

1. Serenko.A, Bontis.N, Booker.L, Sadeddin.k and Hardie.T(2010) A scientometric analysis of knowledge management and intellectual capital academic literature (1994-2008) *JOURNAL OF KNOWLEDGE MANAGEMENT* ,VOL. 14 NO. 1 2010, 3-23, https://www.emerald.com/insight/content/doi/10.1108/13673271011015534/full/html

2. Waila.P, Singh.K.V and Singh.K.M (2016) A Scientometric Analysis of Research in Recommender Systems, *RESEARCH GATE*, Vol -5 (1),pp-71-84, https://www.researchgate.net/publication/307850425_A_Scientometric_Analysis_of_Research_in_Recommender_Systems

3. Esfahania.J.H, Tavasolia.K and Jabbarzadeha.A (2019) Big data and Social media: a scientometrics analysis, *RESEARCH GATE*, pp-145-164 https://www.researchgate.net/publication/330990248_Big_data_and_social_media_A_scientometrics_analysis

4. Fang Yan, Yin Jie and Wu Bihu (2017) Climate change and tourism: a scientometric analysis using CiteSpace, *RESEARCH GATE*, pp-1-19 https://www.researchgate.net/publication/317251175_Climate_change_and_tourism_a_scientometric_analysis_using_CiteSpace

5. Manimegalai.D and Ravi.S (2014) Fashion Technology Research: A Scientometric Analysis, *Asian Journal of Information Science and Technology,* Vol. 4 (1), pp. 54 – 62

https://www.trp.org.in/wp-content/uploads/2016/11/AJIST-Vol.4-No.1-Jan-June-2014-pp.54-62.pdf

6. Paul.G and Deoghuria.S (2014) Indian Journal of Physics: A scientometric analysis, *10th International Conference on Webometrics, Informetrics and Scientometrics & 15th COLLNET Meeting* 2014, pp.209-216 https://pdfs.semanticscholar.org/de05/9b3e5516ce81ebfae56b891b14ab67f31c9b.pdf
7. Brüggmann.D, Pulch.K, Klingelhöfer.D , Pearce.L.C and Groneberg.A.D (2017) Ovarian cancer: density equalizing mapping of the global research architecture, *International Journal of Health Geographics*,pp.2-14 https://www.researchgate.net/publication/312399381_Ovarian_cancer_Density_equalizing_mapping_of_the_global_research_architecture

8. Vakili.Z.F and Rasolabadi.M (2016) Ovarian Cancer Research in Iran: A Scientometric Analysis of Publications Output During Two Decades (1996-2015) in Scopus, *Journal of Chemical and Pharmaceutical Sciences*, pp.10-13 https://www.researchgate.net/publication/311887235_Ovarian_Cancer_Research_in_Iran_A_Scientometric_Analysis_of_Publications_Output_During_Two_Decades_1996-2015_in_Scopus
9. Singh.N, Datta.N.S and Handa.S.T(2019) Research dynamics in Indian fisheries and aquaculture: a scientometric analysis, *CURRENT SCIENCE*, VOL. 117, NO. 3, https://www.researchgate.net/publication/335812219_Research_Dynamics_in_Indian_Fisheries_and_AquacultureA_Scientometric_Analysis

10. Pradhan.B and Ramesh.B.D(2018) Scientomatric analysis of research publications of six Indian Institutes of technology , *RESEARCH GATE*, vol.65, pp.50-56 https://www.researchgate.net/publication/324795928_Scientometric_analysis_of_research_publications_of_six_indian_institutes_of_technology

11. RAMIN.S, GHAREBAGHI.R, HEIDARY.Fs (2015) Scientometric Analysis and Mapping of Scientific Articles on Diabetic Retinopathy, *Med Hypothesis Discov Innov Ophthalmol* VOL-4(3), pp.81-99 https://www.researchgate.net/publication/304582736_Scientometric_Analysis_and_Mapping_of_Scientific_Articles_on_Diabetic_Retinopathy

12. Suradkar.A.P(2016) Scientometric Analysis: International Journal of Skin Therapy Letter, *International Journal of Computer Science and Mobile Computing* ,Vol. 5, Issue. 9, pg.140 – 149 https://www.researchgate.net/profile/Priya_Suradkar/publication/330712919_Scientometric_Analysis_International_Journal_of_Skin_Therapy_Letter/links/5c505f1b92851c22a398a8e6/Scientometric-Analysis-International-Journal-of-Skin-Therapy-Letter.pdf

13. Umamaheswari.S, Kalaiselvan.S and Thilakar.S(2014) Scientometric Analysis of Agricultural Journal, *International Journal of Humanities and Social Science Invention*, Volume 3 ,Issue 1, pp.27-30 https://scholar.google.com/scholar?lookup=0&q=Scientometric+Analysis+of+Agricultural+Journal&hl=en&as_sdt=0,5

14. Padmamma.S, and Walmiki.H.R ,(2016) Scientometric analysis of articles contributions to web of science on uterus cancer, *International Journal of Library & Information Science (IJLIS)* Volume 5, Issue 2, pp. 57–70 https://scholar.google.com/scholar?lookup=0&q=Scientometric+analysis+of+articles+contributions+to+web+of+science+on+uterus+cancer&hl=en&as_sdt=0,5

15. Vanathi.B, Saravanan.T and Nagarajan.M (2015) Scientometric Analysis of Chemistry Research Output in Selected Universities of Tamil Nadu, *IJSR - INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH*, Volume 4, Issue 8, pp.277-279
https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Scientometric+Analysis+of+Chemistry+Research+Output+in+Selected+Universities+of+Tamil+Nadu&btnG=

16. Marisha(2019) Scientometric analysis of Current Science, *CURRENT SCIENCE*, VOL. 117, NO. 2, pp.190-197
https://scholar.google.com/scholar?lookup=0&q=Scientometric+analysis+of+Current+Science+by+marisha++in+2019&hl=en&as_sdt=0,5

17. M.B.S (2018) Scientometric Analysis of Dentistry Research, *Informatics Studies*, Vol. 5 Issue 3, pp.27-35
http://www.indianjournals.com/ijor.aspx?target=ijor:is1&volume=5&issue=3&article=003

18. Hadagali.S.G, Hiremath.S.R, Gourikeremath.N.G, and Bulla.D.S (2019) Scientometric Analysis of Materials Science Research, *Library Philosophy and Practice (e-journal)* ,pp.1-20
https://search.proquest.com/openview/21ec2db578e74bb37eba1ecc1f8748ff/1?pq-origsite=gscholar&cbl=54903

19. Davarpanah.R.M (2012) Scientometric Analysis of Nuclear Science and Technology Research Output in Iran, pp.421–439
https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Scientometric+Analysis+of+Nuclear+Science+and+Technology+Research+Output+in+Iran&btnG=

20. Ali.Hydar and Adithya Kumari H (2018) Scientometric Analysis of World Biodiversity Literature, *International Journal of Library and Information Studies* ,Vol.8(1),pp.261-271
https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Scientometric+Analysis+of+World+Biodiversity+Literature&btnG=

21. https://www.ncbi.nlm.nih.gov/mesh/
22. Ajiferuke, I., Burell, Q., & Tague, J. (1988). Collaborative coefficient: A single measure of the collaboration in research. *Scientometrics,* 14, 421-433. https://doi.org/10.1007/BF02017100

23. Lawani, S. M. (1980). *Quality, collaboration and citations in cancer research: Abibliometric study* (Doctoral dissertation). Florida State University, Florida.

24. Subramayam, K.(1983). Bibliometric study of research collaboration:A review, *Journal of Information Sciernce*, 6 33-38. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.838.7334&rep=rep1&type=pdf