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INDIA'S CONTRIBUTION TO COVID-19 RESEARCH: A BIBLIOMETRIC STUDY

Ajitkumar Rajkumar Prajapati[1] , Dr.Praytkar Kanadia[2]

[1]Research Scholar(PhD Pursuing) Gujarat Vidyapith, Ahmedabad,Gujarat

&

[2]Associate Professor, Gujarat Vidyapith, Ahmedabad, Gujarat

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ABSTRACT

COVID-19 affected almost every human on this planet directly or indirectly. This virus changed the lifestyle of humans, the world economy has sunk, and because of the influential nature of the virus, people are maintaining social distancing. Researchers and scientist across the world are trying their best to find a solution for this pandemic, and due to this within the first six months of the 2020 year, over twenty thousand research papers have been published. It is itself a record that within small timespan, these many studies have been conducted by the researchers on the same topic. To measure the Indian researchers' contribution to COVID-19 research, this study was conducted. As a result total of 1129 articles were published by the Indian authors individually and collaboratively, all these publications are mostly in the reputed journals, and the references of these studies are fairly used in the further next studies by the rest researchers. Indian researchers are also jointly conducting studies with the other researchers who are associated with reputed international organizations. This bibliometric study also covers country collaborations, author collaborations, funding agencies, co-occurrence of keywords, etc.

KEYWORDS:COVID-19; Corona Virus; Bibliometrix R; Biblioshiny

INTRODUCTION

Novel Coronavirus (COVID-19) has become the biggest problem for the whole world. It is also known as SARS-CoV-2, and it affects serious diseases related to the respiratory system.As per the research, this pandemic stated from Wuhan, China, and by the end of 2019, it spread over the whole worldand on 30th January WHO has declared this outbreak a Public Health Emergency of International Concern (PHEIC).As the latest statistics from the WHO official website, COVID-19 infected cases are 8,506,107 and 455,231deaths. India is the 4th most infected country now with a total of 395,048 confirmed cases following USA, Brazil and Russia are respectively at first, second and third positions. COVID-19 is a mutateand infectious virus, to control the virus infection, many countries have declared a countrywide lockdown because of this many countries are facing an economic slowdown. This virus has affected not only health-wise but also drastically affected the economy of all most all the countries.The Countrywide lockdown has controlled the infection of the virus, but as soon as the lockdown opened, the positive cases of COVID-19 were increased.

To deal with COVID-19across the world,researchers and scientists are doing their best, and each day new studies are conducting to find the solutions for the virus. Various studies and vaccines are undergoing. Unfortunately,the world did not reach the proper solution. These studies have generated a considerable amount of research papers and other materials, and it is still increasing rapidly. Till 20th June 2020, the world's most known citation database Scopus & Web of Science indexed 18,699 and 7,934 respectively. In these numbers, Indian scientists have also contributed. The main objective behind this study is to identify the publications from India on COVID-19, national and international collaboration, funding agencies, authors, most preferred journals to publish the research.

REVIEW OF LITERATURE

Bibliometrics study can be applied to all the subject areas of studies. In the field of medicine, the study was conducted on the master thesis of the medical colleges by Dhaliwal, Singh & Bhatia. In the study, five years (2001-05) postgraduate theses have been taken to conduct this research. Everything remains typical for this study except the method they have followed. To identify the publications indexed in scientific journals, they

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have taken the source of Medline database instead of well-known databases like Scopus or Web of Science as their area of research was medicine. It is sporadic that in the bibliometrics study researcher used the Chi-square test and t-test for comparing the results. In a nutshell of the study, gender of the students, department of origin, year of thesis submission, the hierarchy of the supervisor, number and department of co-supervisors, and thesis characteristics did not influence publication rates, only 30% of theses related research conducted in the medical colleges which were published in scientific journals and also indexed by the bibliography indexing agencies. This study was not able to identify the factors which give the influence to promote publications(Bhatia et al., 2010).

In InstitutQuímic de Sarriá Spain, citation analysis of doctoral theses was undertaken and the result was used as an input for collection development of their Chemistry library. For this study, researchers have taken 8 years theses and their citations irrespective of the document types i.e.: monographs, theses, academic dissertation, articles journals, conference papers, and other documents. The analysis process by document type, by year etc. the unique thing about this research was to give cost per citation study. To get his cost, researchers have compared the cited documents with subscriptions they have taken for the respective sources, and based on the number of times citation done from the subscribed sources, they compared with the average price of the article/document and reach to the cost per citation. So far, the limitation of this study was that they had taken 8 years of the theses data and so the average cost of the sources may vary for each year(Vallmitjana&Sabaté, 2008).

In the area of bibliometrics study variety of research has been undertaken, bibliometrics study on subject "Intellectual Property" was conducted for the 9 Federal Universities of theNortheast Region of Brazil i.e.: Federal University of Bahia(UFBA), Federal University of Sergipe (UFS), Federal University of Alagoas (UFAL), Federal University of Pernambuco(UFPE), Federal University of Paraíba (UFPB), Federal University of Ceará (UFC), Federal University of Maranhão (UFMA), Federal University of Piauí (UFPI), Federal University of Rio Grande do Norte (UFRN). The study outcome was that the study contains 34 postgraduate level theses and only 4 doctorate-level theses. The Federal University of Sergipe has a maximum number i.e.: 21 papers, 38 Dissertations and Theses, which covers 55.3% of the chunk. Moreover, considering overall thesis analysis following terms were highly discussed throughout the universities: Trademark registration; Patents and Technological Innovation; Transfer of Technology and IP in Universities; Copyright and Geographical Indication(Zinn &Gasque, 2017).

In the study conducted by Esfahani, Tavasoli&Jabbarzadeh, bibliometrics analysis was done for the effect of social networks on big data. In this study, the Scopus database taken for primary search source of information, 2000+ cited articles were extracted over the period 2012-19. These data were statistically analysed using the Bibliometrix R-package. Various techniques have been used to drawout the results. As an outcome of this study, research on these topics grown exponentially since 2014, and the trend remains consistent. Based on the research, most cited publications were from countries of the United States (7548 highly citations), followed by the United Kingdom (588 citations) and China (543 citations)(JelvehgaranEsfahani et al., 2019).

In the area of bibliometrics research, various metrics are available i.e.: h-index, g-index, impact factor, altmetrics etc. In addition to these metrics, one new metric has come "Article-Level Metrics," which evaluates the article. This study supports the meta-analysis of the coverage and metric counts received by more than 100 published publications. This article covers the most comprehensive analysis of altmetric data providers i.e.: Lagotto, Altmetric.com, ImpactStory, Mendeley, PlumX, Crossref Event Data). Using this data provider researcher tried to explore the coverage of publications, social media and events from a longitudinal view. During this comparison, disciplinary differences were also analysed. The Study explains, most of the studies were based on Altmetric.com data, it covers almost all the known social media sites, blogs and other websites. Secondly, PlumX has better coverage, it counts more Mendeley readers and covers less events. Crossref Event Data has exclusive coverage from Wikipedia and Lagotto is limited to specific publishers' contents, whereas ImpactStoryis better known for its limited reach and customization also it gives contents from other providers like Altmetric.com(Ortega, 2020).

METHODOLOGY

Search Strategy and Data Extraction

To study the quantitative analysis of the publications on COVID-19, a bibliographic database SCOPUS has been used. The related information was downloaded from a database using the term "COVID-19" and "Corona Virus" on 20th June 2020. To make is more comprehensive search, Boolean Operator "OR" has been used for both terms and the fields Article, Title, Abstract, Keywords were used. The search generated a total of 18950

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publications indexed by Scopus on the given terms.However, the result gives all the publications published by authors located across the world. Therefore,to extract India's publications filter "Country/Territory" has been used, which ultimately given 1129 total publications published by Indian authors/organizations. In this study, no year barrier has been applied, whatever data indexed by the SCOPUS that has been taken for the analysis. The extracted data contains Final & Article in Press both the stages publications and for this study both stage type publications have been considered. The publications data downloaded in CSV/BibTex/TXT format and later to analyze the data R software was used. In R software, the biblioshiny app, which is an entirely web-based application, was used to do science mapping and bibliometric analysis (Aria et al., 2020).

LIMITATION OF THE STUDY

This study is conducted by limiting the following criteria:

- Bibliographic database (SCOPUS) was used to carry out this study
- SCOPUS widely covers the English journals hence, non-English material was not considered for this study
- Additional statistics are generated from other reputed databases and also self-calculated
- This study is undertaken only for the Indian authors' publications on the topic COVID-19, it may also cover international/non-Indian authors as the papers may in collaboration
- This study was purely carried based on the bibliographic details, during the study full text of the articles were not reviewed.

Result & Observation/Discussion

In order to do the analysis, after applying necessary terms and filters,a total of 1129 publications have been retrieved. The gist of the results is Total 1129 publications were covered under the period of 1979 to 2020, and all these publications were published in 396 sources (Books, Journals, etc.), 810 articles are Open Access, the various funding agencies funded total 64 projects, average publications by year stands at 0.272, 1.785 average citations received, total publications contains 22410 references and total 2015 citations were received.

Year-wise publications

Table 1: Year-wise Publications

Year	No of Publications
1979	1
1995	1
2002	2
2004	1
2005	2
2009	1
2010	3
2011	3
2012	2
2013	3
2014	5
2015	2
2016	1
2017	1
2018	2
2019	3
2020	1096
Total	**1129**

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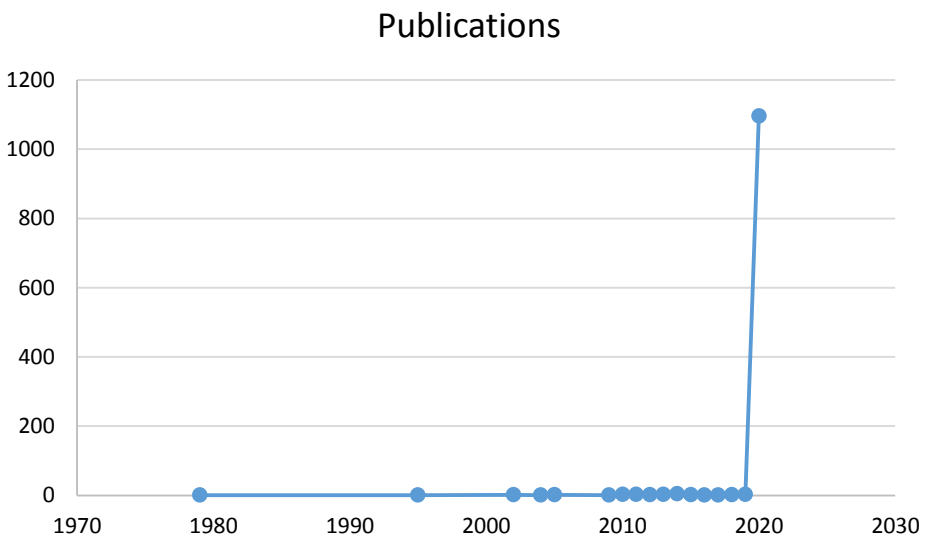

Figure 1: Year-wise publications

It is clearly shown that most of the articles were published in the year 2020 (1129 publications). In the past, 33 publications were published, but that chunk wastiny. It means that in the earlier time, research has been undertaken by the Indian research on the influential virus.

Publications and Collaborations

Publications by country

Considering the corresponding authors' country affiliation, the extracted publications were from 24 countries. Indian was the country with most scientific papers published on COVID-19 (278 publications) followed by USA (8), United Kingdom (7), Iran (3). It shows the highest contribution from India as in this study, and only Indian publications were extracted. It shows that Indian authors have submitted a good chuck of publications as a corresponding author.

In this bibliometric study, considering the corresponding author's country as the main country of publications and based on other co-author's affiliation, one can classify single country publications (SCP) or multiple country publications (MCP). By viewing the following Figure-2, most of the publications were from single country publications. For example, India as a corresponding author's country it shows 244 publications as single country publications and 34 publications as multiple country publications. Considering the top 10 contributing countries were India, USA, UK, Iran, Canada, Hong Kong, Italy, Korea, Morocco, and Thailand.

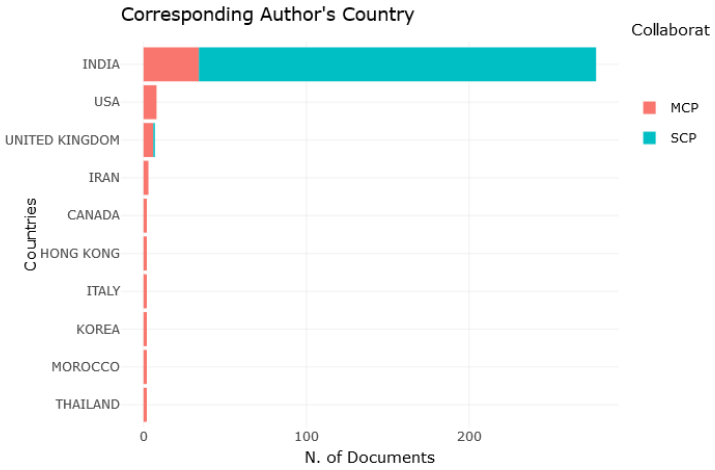

Figure 2: Single & Multiple Country Publications

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Considering the most cited countries, India stands at the highest with 671 citations, USA (26), UK (23), Norway (13), Canada (9), France (7), Korea (4), Iran (3), Austria (1) and China (1).

Country collaboration

Collaboration between authors' countries for the publications is shown in Figure-3.To understand the collaboration based on the affiliation, each author's country has been extracted. The countries which are more collaborated with India were United Kingdom, USA, Australia, and China. Whereas, Germany, Brazil, Spain, Italy, and Iran in the next level of collaboration.

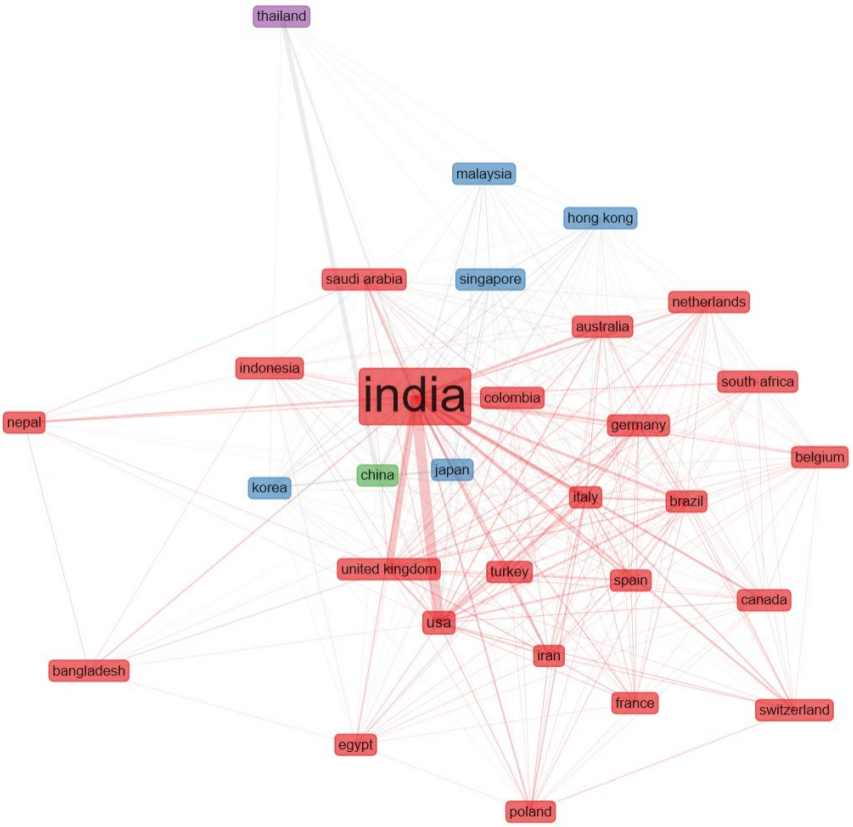

Figure 3: Country Collaborations

Authors and Collaborations

In this given study, most of the publications were co-authored publications, and only 13% of publications (147 out of 1129) were single-authored publications, and 982 publications were multi-authored(Veenhoven, 1991). Considering the multi-authored publications with more than one author, the collaboration index was 3.6, which describes that average authors per publications were between three and four.

Top-Author's production over the time

The given Table-2 and Figure-4 show the number of publications by the most productive authors, as in the initial years, much research was not carried out on "COVID-19". Hence 2005 onwards data is visible. The most contributing author can define multiple ways, i.e.: highest number of citations, publications, and h-index(Hirsch, 2005). Based on the number of citations received most impact author is "DHAMA K". He received a total of 153 citations for their 12 publications, and his h-index is 5. Based on the number of publications author "WIWANITKIT V" is impact author as he has published a total of 61 publications, he got 49 citations, and his h-index is 3. Same way, based on h-index author,"MISRA A" is most impact author as his h-index is 6, he has received a total of 123 citations, and he published 13 publications. One more step ahead, if the data interpreted then out of 1129 publications total of 244 publications were published in the Single Country Publications (SCP) collaboration.

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Table 2: Top-Authors' Production Over the time

Author	Year	Frequency	Total Citations	Total Citation Per Year
GUPTA N	2016	1	5	1
GUPTA N	2020	28	30	30
GUPTA S	2020	19	17	17
JOOB B	2020	25	36	36
KUMAR A	2018	1	3	1
KUMAR A	2020	28	27	27
KUMAR S	2005	1	0	0
KUMAR S	2019	1	1	0.5
KUMAR S	2020	28	50	50
SHARMA P	2011	1	2	0.2
SHARMA P	2020	15	17	17
SINGH A	2020	33	124	124
SINGH S	2014	1	14	2
SINGH S	2019	1	0	0
SINGH S	2020	27	43	43
VAISHYA R	2020	18	25	25
WIWANITKIT V	2020	61	49	49

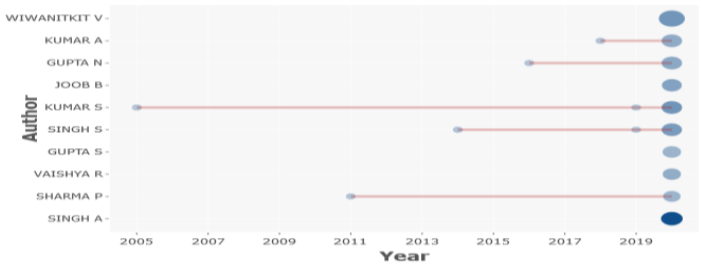

Figure 4: Top-Authors' Production Over the time

Authors' Collaboration Network

Figure-5 shows a strong collaboration between the authors. To measure the authors' collaboration, author and co-authors' publications were mapped and finding out the group of authors who are jointly doing the research. To measure this, 30 nodes are considered with the maximum labelswere 50, and the Walktrap cluster algorithm was used to generate the chart. More significant icons and the same colour show the strong collaboration between the authors.

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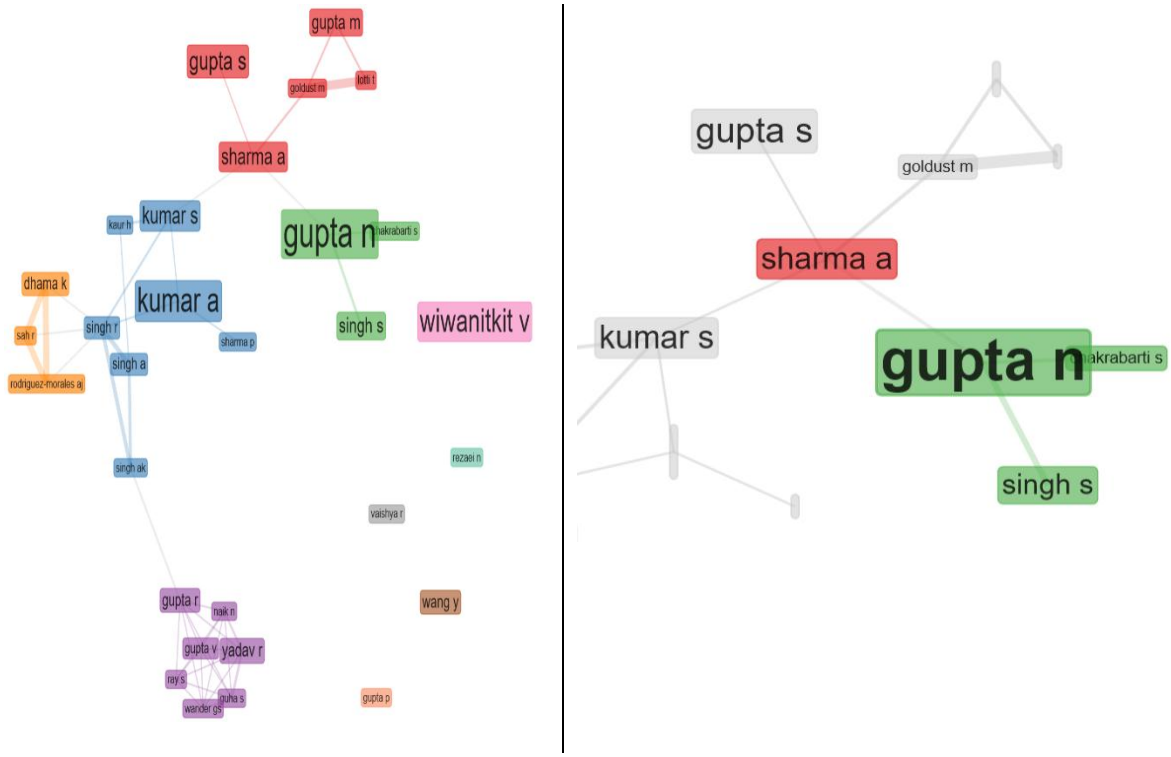

Figure 5: Authors' Collaboration Network

To understand this cluster here,'gupta n' collaborative network is taken as an example. Author 'gupta n' is having a strong collaboration with author' sing s' and 'chakrabarti s', whereas with author 'sharma a' the author has moderate level collaboration with authors' kumar s', 'gupta s' and 'goldust m' and for others, the author has limited collaboration.

Most Cited Publications, References and Co-Citations

Most Cited Publications

Table-3 describes the ten most global cited publications. The most highly cited paper entitles "Synthesis, antiviral activity and cytotoxicity evaluation of Schiff bases of some 2-phenyl quinazoline-4(3)H-ones" by "KUMAR KS" published in "European Journal of Medicinal Chemistry" has total 106 citations. The second article is "Clinical, laboratory and imaging features of COVID-19: A systematic review and meta-analysis" by "Rodriguez-Morales AJ" published in "Travel Medicine and Infectious Disease", it has total 103 citations. A third position, article titled "Prevalence of viral infection detected by PCR and RT-PCR in patients with acute exacerbation of COPD: A systematic review" by "MOHAN A" published in "Respirology" has total 91 citations.

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Table 3: Most Cited Publications

Publications	Total Citations	Total CitationsPer Year
KUMAR KS, 2010, EUR J MED CHEM	106	9.6364
RODRIGUEZ-MORALES AJ, 2020, TRAVEL MED INFECT DIS	103	103
MOHAN A, 2010, RESPIROLOGY	91	8.2727
SACHDEVA G, 2005, BIOINFORMATICS	90	5.625
GUPTA R, 2020, DIABETES METAB SYNDR CLIN RES REV	52	52
SINGHAL T, 2020, INDIAN J PEDIATR	52	52
LENG Z, 2020, AGING DIS	44	44
PHUA J, 2020, LANCET RESPIR MED	41	41
BANERJEE D, 2020, ASIAN J PSYCHIATRY	35	35
THAKUR N, 2012, NUCLEIC ACIDS RES	32	3.5556

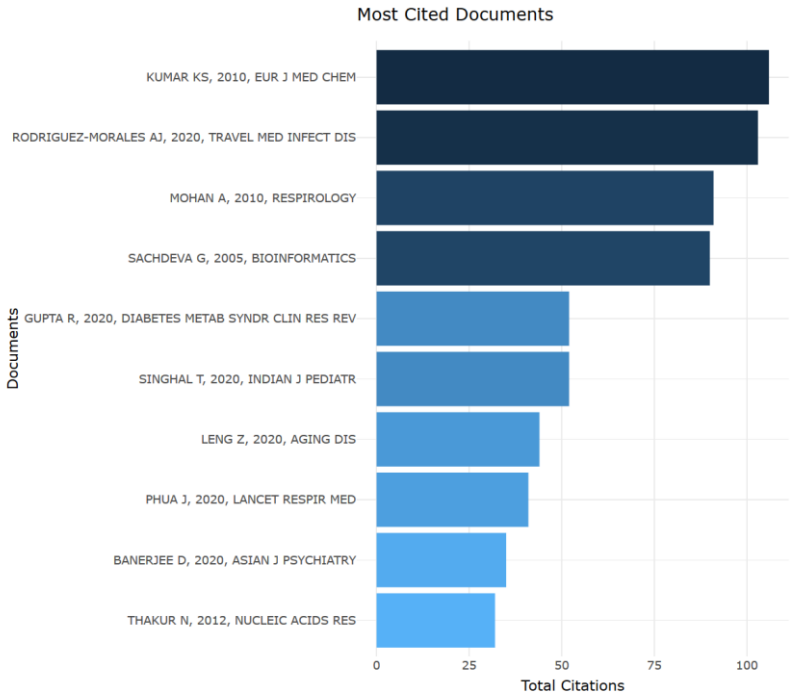

Figure 6: Most Cited Publications

Out of these 1129 publications, ten most locally cited publications are given in Table-4.It shows there is an enormous difference in citing the publications. In all cases, local citations are minimum then the global citation number. The most highly paper "Clinical considerations for patients with diabetes in times of COVID-19 epidemic" by Gupta R" published in Diabetes & Metabolic Syndrome: Clinical Research & Reviews has a total of 16 citations.

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Table 4: Most Local versus Global Cited Publications

Publication Details	Year	LocalCitations	GlobalCitations
GUPTA R, 2020, DIABETES METAB SYNDR CLIN RES REV	2020	16	52
MALHOTRA N, 2020, INDIAN J ANAESTH	2020	15	21
BANERJEE D, 2020, ASIAN J PSYCHIATRY	2020	11	35
SINGH AK, 2020, DIABETES METAB SYNDR CLIN RES REV	2020	11	21
GHOSH A, 2020, DIABETES METAB SYNDR CLIN RES REV	2020	11	13
SINGHAL T, 2020, INDIAN J PEDIATR	2020	9	52
RODRIGUEZ-MORALES AJ, 2020, TRAVEL MED INFECT DIS	2020	8	103
VELLINGIRI B, 2020, SCI TOTAL ENVIRON	2020	8	15
PRAJAPAT M, 2020, INDIAN J PHARMACOL	2020	8	14
PAL R, 2020, DIABETES RES CLIN PRACT	2020	7	18

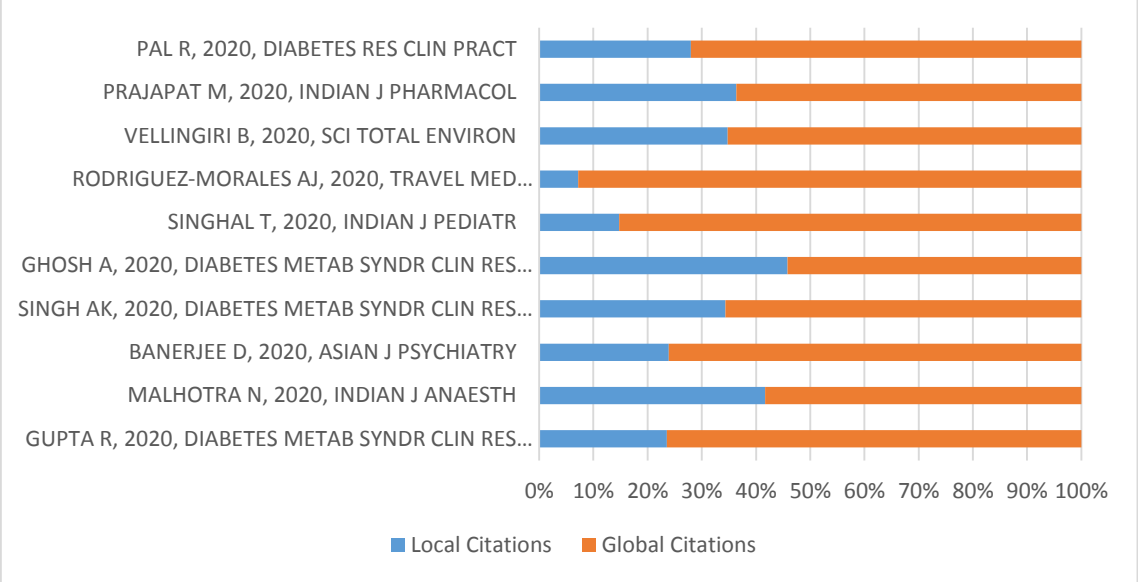

Figure 7: Most Local versus Global Cited Publications

Most Cited References

Table-5 showcased ten most used references within 1129 publications. Specifically, the most cited reference was cited 42 times out of 1129 publications, and the first author published it,"Huang, C.".

Table 5: Most cited references within publications

Cited References	Citations
HUANG, C., WANG, Y., LI, X., CLINICAL FEATURES OF PATIENTS INFECTED WITH 2019 NOVEL CORONAVIRUS IN WUHAN, CHINA (2020) LANCET, 395, PP. 497-506	45
HSIA, W., EMERGING NEW CORONAVIRUS INFECTION IN WUHAN, CHINA: SITUATION IN EARLY 2020 (2020) CASE STUDY CASE REP, 10, PP. 8-9	20
CHEN, N., ZHOU, M., DONG, X., QU, J., GONG, F., HAN, Y., EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS OF 99 CASES OF 2019 NOVEL CORONAVIRUS PNEUMONIA IN WUHAN, CHINA: A DESCRIPTIVE STUDY (2020) LANCET, 395, PP. 507-513	16
YASRI, S., WIWANITKIT, V., EDITORIAL: WUHAN CORONAVIRUS OUTBREAK AND IMPORTED CASE (2019) ADV TROP MED PUB HEALTH INT, 9, PP. 1-2	12

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GAO, J., TIAN, Z., YANG, X., BREAKTHROUGH: CHLOROQUINE PHOSPHATE HAS SHOWN APPARENT EFFICACY IN TREATMENT OF COVID-19 ASSOCIATED PNEUMONIA IN CLINICAL STUDIES (2020) BIOSCI TRENDS, 14, PP. 72-73	11
MALHOTRA, N., JOSHI, M., DATTA, R., BAJWA, S.J., MEHDIRATTA, L., INDIAN SOCIETY OF ANAESTHESIOLOGISTS (ISA NATIONAL) ADVISORY AND POSITION STATEMENT REGARDING COVID-19 (2020) INDIAN J ANAESTH, 64, PP. 259-263	10
CHEN, N., ZHOU, M., DONG, X., EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS OF 99 CASES OF 2019 NOVEL CORONAVIRUS PNEUMONIA IN WUHAN, CHINA: A DESCRIPTIVE STUDY (2020) LANCET, 395, PP. 507-513	9
MEHTA, P., MCAULEY, D.F., BROWN, M., SANCHEZ, E., TATTERSALL, R.S., MANSON, J.J., COVID-19: CONSIDER CYTOKINE STORM SYNDROMES AND IMMUNOSUPPRESSION (2020) LANCET, 395, PP. 1033-1034	9
HUANG, C., WANG, Y., LI, X., REN, L., ZHAO, J., HU, Y., CLINICAL FEATURES OF PATIENTS INFECTED WITH 2019 NOVEL CORONAVIRUS IN WUHAN, CHINA (2020) LANCET, 395 (10223), PP. 497-506	8
LU, R., ZHAO, X., LI, J., NIU, P., YANG, B., WU, H., GENOMIC CHARACTERISATION AND EPIDEMIOLOGY OF 2019 NOVEL CORONAVIRUS: IMPLICATIONS FOR VIRUS ORIGINS AND RECEPTOR BINDING (2020) LANCET, 395, PP. 565-574	8

CO-CITATION SOURCE NETWORK

Figure-8 shows the co-citation network of the top ten sources using the Fruchterman and Reingold layout technique. The node size is subject to the number of connections the node has, andthe bigger node will have more number of connections, and the thickness of lines shows the number of studies involved. The group is identified with a single colour, and for this visualization,the Louvain cluster algorithm has been used. In the Figure-8, 2020 is a data mistake as the source file contains this value.

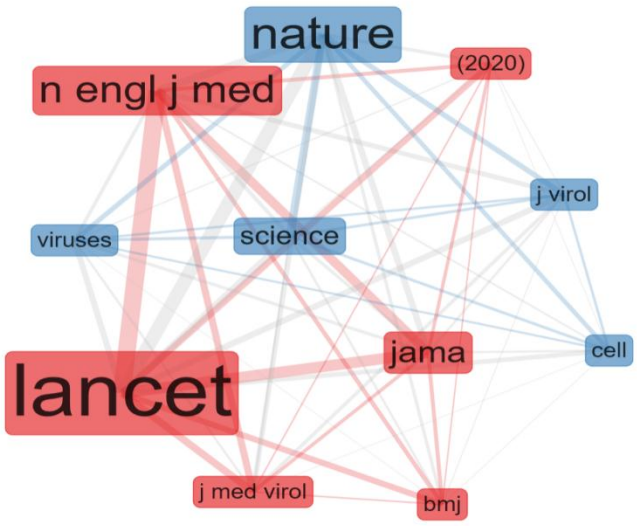

Figure 8: Co-citation Network of Sources

Sources, Affiliations, Keywords & Funding Organizations

Most Relevant Sources

The given Table-6 shows the top 10 sources where a good number of publications have published by the Indian researchers. It also shows that the major journals are from Indian publishers. The CiteScore of these journals standsbetween 0 to 2.6. It also shows that six journals are subscription-based, and the rest are open-source journals.

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Table 6: Most Relevant Sources

Sources	No of Publications	CiteScore	SJR	SNIP	Journal Type
DIABETES AND METABOLIC SYNDROME: CLINICAL RESEARCH AND REVIEWS	45	2.600	0.672	0.982	Subscription
INTERNATIONAL JOURNAL OF ADVANCED SCIENCE AND TECHNOLOGY	40	0.000	0.108	0.085	Subscription
INDIAN JOURNAL OF PUBLIC HEALTH	38	1.000	0.305	-	Open Access
ASIAN JOURNAL OF PSYCHIATRY	28	2.700	0.736	1.022	Subscription
INDIAN JOURNAL OF COMMUNITY HEALTH	28	0.200	0.132	0.258	Subscription
INDIAN JOURNAL OF OPHTHALMOLOGY	28	1.600	0.482	0.931	Open Access
DERMATOLOGIC THERAPY	26	1.800	0.583	0.883	Subscription
ECONOMIC AND POLITICAL WEEKLY	25	0.600	0.298	0.644	Subscription
INDIAN JOURNAL OF ANAESTHESIA	21	2.000	0.464	0.841	Open Access

Most Relevant Affiliations

Table 7: Most Relevant Affiliations

Affiliations	Articles
ALL INDIA INSTITUTE OF MEDICAL SCIENCES	189
POST GRADUATE INSTITUTE OF MEDICAL EDUCATION AND RESEARCH	129
DR DY PATIL UNIVERSITY	46
UNIVERSAL SCIENTIFIC EDUCATION AND RESEARCH NETWORK	46
INDRAPRASTHA APOLLO HOSPITAL	25
BANGALORE MEDICAL COLLEGE AND RESEARCH INSTITUTE	20
BHARATHIAR UNIVERSITY	20
ICAR-INDIAN VETERINARY RESEARCH INSTITUTE	20
INDIAN COUNCIL OF MEDICAL RESEARCH	20
SANJAY GANDHI POSTGRADUATE INSTITUTE OF MEDICAL SCIENCES	20

The most productive institute/organization is "ALL INDIA INSTITUTE OF MEDICAL SCIENCES" with a total of 189 publications, at the second rank "POST GRADUATE INSTITUTE OF MEDICAL EDUCATION AND RESEARCH" with total 129 publications and "DR DY PATIL UNIVERSITY" stands at third position. Table-7 shows the top ten institutes/organizations with a minimum of 20 articles. It shows that Indian organizations are also fairly contributing to COVID-19 research.

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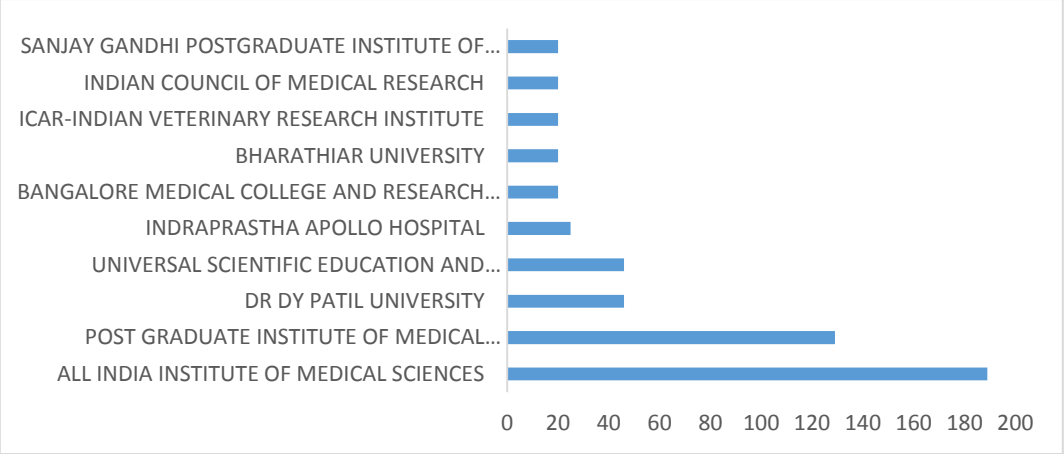

Figure 9: Most Relevant Affiliations

Network Collaboration between Organizations

Based on the data extracted, Figure-10 showing strong network collaboration between the organizations top 50 organizations. To measure this collaboration, authors' affiliated institutions are extracted and matching with the rest author's affiliations. In short, it is mapping between affiliation organizations. By viewing the Figure-10, we can make out that in the Indian context, All India Institute of Medical Sciences has strong collaborative network between the organizations All India Institute of Medical Sciences, Indraprastha Apollo Hospital, Centre for Sight, King George's Medical University and Post Graduate Institute of Medical Education and Research.

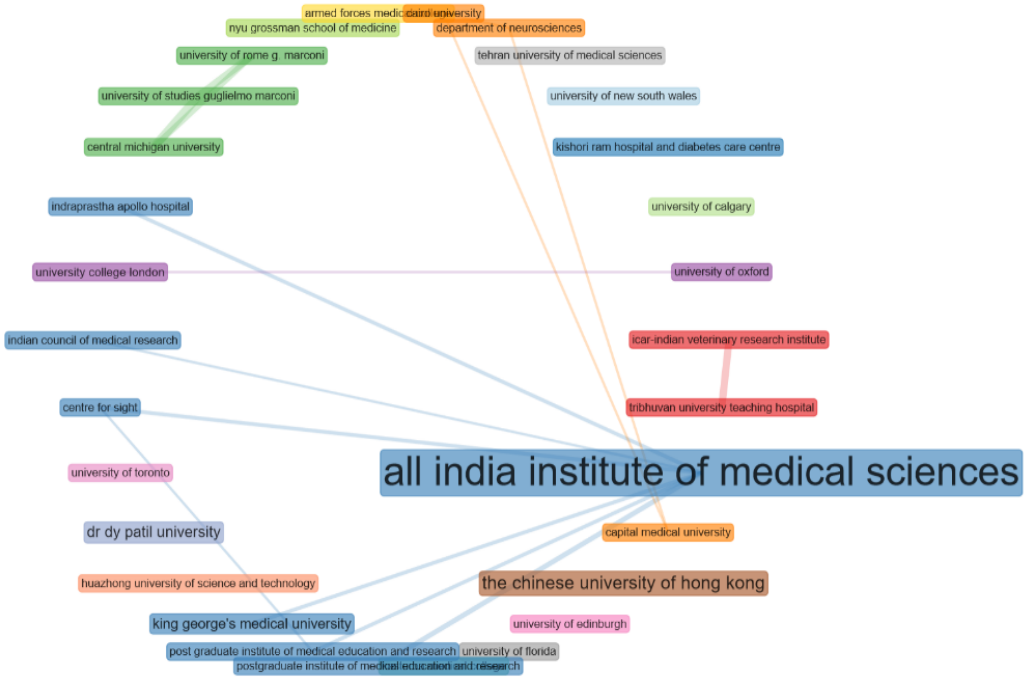

Figure 10: Collaboration Network between the organizations

Most preferred Authors'Keywords

Total 4036 Scopus Keywords have been extracted from the publications.Compare to these, the Authors' specified Keywords were 1833. The top 10 authors' keywords were: "covid-19" (453 times), "coronavirus" (149 times), "sars-cov-2" (118 times), "pandemic" (96 times), "hydroxychloroquine"(35 times), "india" (30 times), "lockdown" (18 times), sars(18 times), 2019-ncov (15 times), telemedicine (14 times). It is important that while searching data in the database, the terms "COVID-19" and "Corona Virus" were used in title,

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keywords, and abstracts. If both these terms excluded from the result, then keyword "epidemiology" (13 times) and "molecular docking" (12 times) used.(Diener, 1994)

As indicated in Figure-11, the same colour shows the co-recurrent keywords. It is interpreted in as similar to co-citation analysis. This kind of analysis helps in understanding the overview of the research carried out. As here, the Louvain cluster algorithm is used with the circle layout, it shows the co-occurrence of the keywords with the same colours and thickness of the link also shows the number of studies involved with the same keyword(Callon et al., 1991).

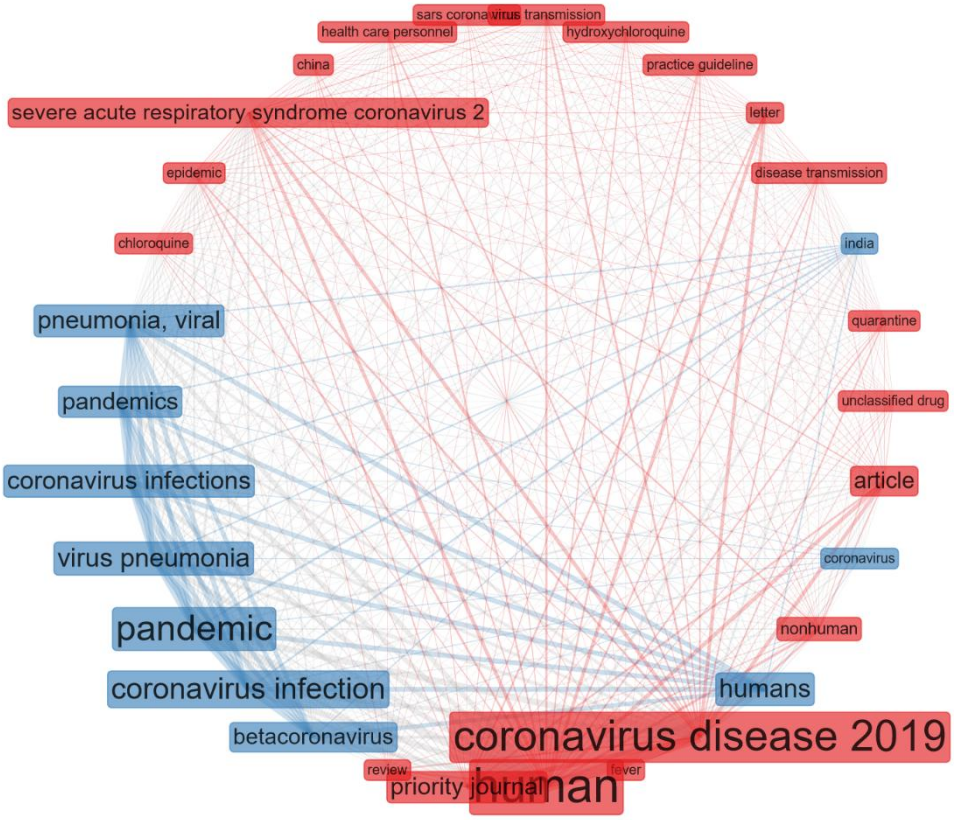

Figure 11: Most preferred Authors' Keywords

Funding Organizations

Funding organizations are funding the various projects, it gives financial supports to the projects, and sometimes few organizations collaboratively fund the research projects. To find the possible solution for COVID-19 various countries have rollout the research projects, and funding organizations have supported them. For the extracted data following countries given in Table-8 werefunding to research projects on COVID-19, as the researcher data is from India, most of the funding organizations are from India, but Indian authors' have also contributed internationally hence in the funding organization list Bangladesh (7 projects), USA (5 projects) and China (5 Projects) as showing as contributors. The most Indian projects funding organizations are Science and Engineering Research Board (13 projects), Department of Science and Technology, Government of Kerala (10 projects), Department of Science and Technology, Ministry of Science and Technology, India (10 projects) and Indian Council of Medical Research (10 projects).

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Table 8: Top funding organizations

Funding Organizations	No of Projects	Country
Science and Engineering Research Board	13	India
Department of Science and Technology, Government of Kerala	10	India
Department of Science and Technology, Ministry of Science and Technology, India	10	India
Indian Council of Medical Research	10	India
Department of Biotechnology, Government of West Bengal	9	India
Bangladesh Council of Scientific and Industrial Research	7	Bangladesh
Council of Scientific and Industrial Research, India	6	India
Department of Biotechnology, Ministry of Science and Technology, India	6	India
National Institutes of Health	5	USA
National Natural Science Foundation of China	5	China

CONCLUSION

Using bibliometric tools, one can measure the various parameters related to publications, and based on that quantitative analysis can be performed. To understand the contribution of Indian researchers for the COVID-19 pandemic, this study is undertaken. As a result of this study, the most prolific authors and organizations, funding agencies, co-occurrence keywords, etc. This study explains that to deal with this crisis of COVID-19 various studies haven undertaken in the small timespan. Because of this only within a few months, thousands of publications have published for this topic. Researchersare doing their best irrespective of their country locations and the way this pandemic affected their country. India is also not behind in these contributions. Till 20th June 2020, Indian researchers/organizations have published a total of 1129 publications, which is a 6% of overall research on COVID-19. Indian researchers are also collaboratively researching with not only domestic researchers but also with the researchers who are internationally associated with reputed institutions/organizations. Therefore, a bibliometric study is the most preferred way to measures the productivity of the specific topic, organizations, authors, etc.

Conflicts of Interest: The authors declare no conflicts of interest. This study is undertaken only for educational purposes.

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