Six clusters of Pandemic Covid-19 articles in Scopus from 2020 to 2022 using social network analysis

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Abstract

The aim of this study was to analyse the bibliographic characteristics and content of articles on Pandemic Covid-19 published in journals indexed by Scopus written by researchers from throughout the world. We conducted a bibliometric and content analysis of publication in the Scopus database. We only retrieved articles written in English. We conducted content analysis using the VOSviewer software and visualized the co-occurrence of keywords and bibliographic coupling of sources and countries. Following the study protocol, we found 1864 articles on Pandemic Covid-19 over the past 3 years. The most productive journal that published these articles was Frontiers In Psychology (n=47). The post productive country were United States (n=260). Based on cititations, the most influential authors, and journals were Nicola et al., (2020)(n=2753), and International Journal of Surgery (n=2770). The keywords of research on Pandemic Covid-19 formed 6 clusters (e.g Covid-19, Human, and Pandemic). From a global perspective, Pandemic Covid-19 research in the past 3 years has increased significantly. There were European published journals ominated publications. Thus, Asian country need to conduct more active research on this topic.

Keywords: *Pandemic Covid-19, Scopus, VOSViewer*

Introduction

This article discusses the discourse Pandemic Covid-19. The discourse understanding is inseparable from bibliometric analysis (Lee, 2020; Mifrah, 2020; Omoregbe et al., 2020; Saravanan & Dominic, 2014), referring to the incorporation of various frameworks and methods to analyze citations from scientific publications. Such attempt leads to the development of different metrics to gain insight into the intellectual structure of a broad academic discipline and to evaluate the impact of a particular field of study (Akhavan et al., 2016; Putera et al., 2020).

Although some researchers have produced Pandemic Covid-19 articles, we have not found research in bibliometric articles on Pandemic Covid-19 utilized social network analysis. This aim of this article was to provide useful data for understanding global publication trends regarding Pandemic Covid-19. This study aimed to analyze the bibliographic characteristics and trends of

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articles on Pandemic Covid-19 published in journals indexed in Scopus written by researchers from throughout the world and to conduct an analysis of keyword co-occurance using VOSviewer.

Methods

This study did not involve human subjects; therefore, neither institutional review board approval nor informed consent was needed. This study was a descriptive and bibliometric analysis based on a literature database. The data in this study were retrieved from the Scopus database. To obtain the necessary data, this study used the keyword "Pandemic Covid-19" in the title, abstracts, and author's keywords. In this step, we found 1864 articles. In the next step, we downloaded the articles from the scopus database and analyzed the 1864 articles that had been sorted by relevance. In this study, the metadata and refined Scopus result values were retrieved in the Csv dataset format. However, before the bibliometric analysis, the consistency and reliability of the data were checked to address issues such as a lack of consistency in country names and keywords. The data were also standardized to ensure consistency regarding key words that sometimes appeared in singular or plural, abbrevieations, or other forms. The data obtained from the Scopus database were analyzed using VOSviewer software, and simple statistics were calculated using Microsoft Excel.

Results

The development of 'Pandemic Covid-19' publications indicates an increase, from 2020 to 2021. The trend analysis (see Fig. 1) indicates that during before 2020, there were no 'Pandemic Covid-19' publications on the Scopus database.
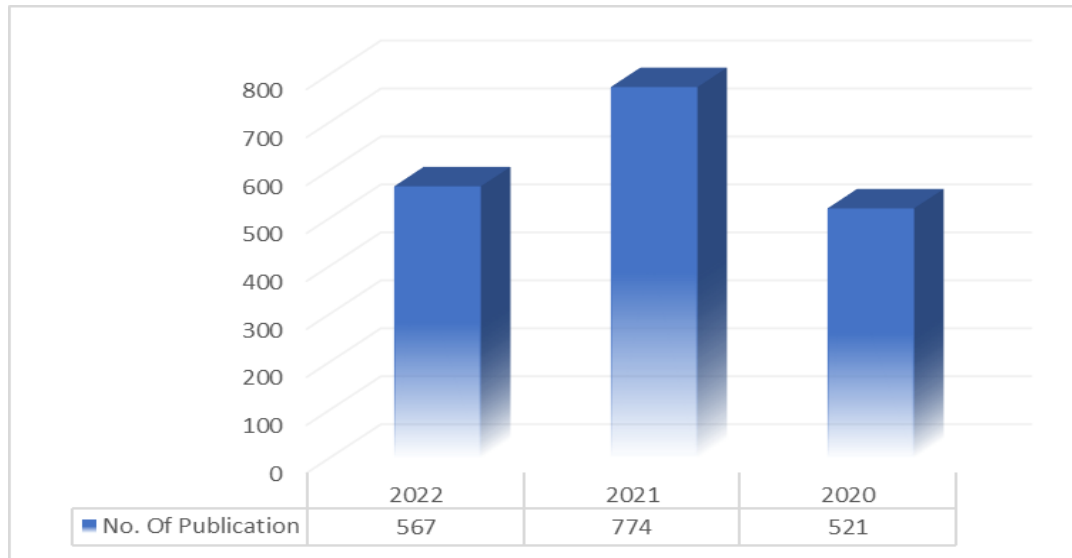

	2022	2021	2020
No. Of Publication	567	774	521

Figure 1 Publication Trend "Pandemic Covid-19".
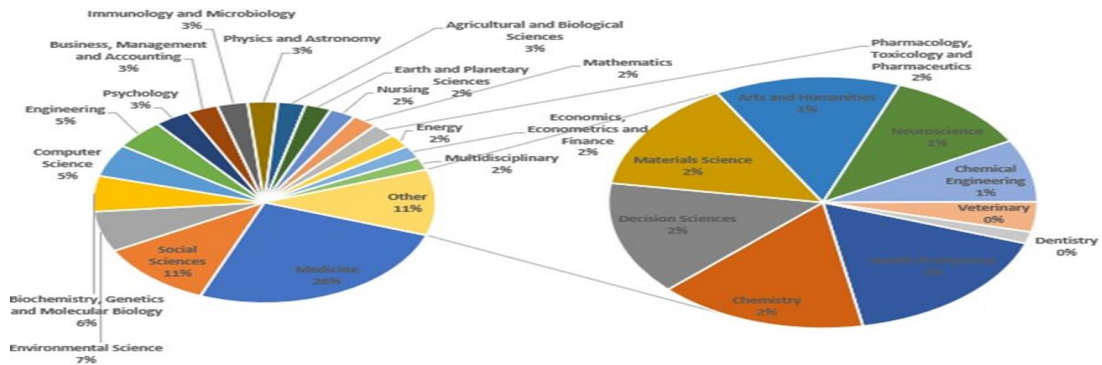
Source : Processed by Author

Figure 2 Publication Trend "Pandemic Covid-19" based on Subject Area

Source : Processed by Author

Based on a search with the keyword "Pandemic Covid-19", the result showed approximately 1864 documents. Most articles were listed under Medicine (n=815, 26%), Social Sciences (n=345, 11%), Environmental Science (n=207, 7%), Biochemistry, Genetics and Molecular Biologi (n=182, 6%), and Computer Science (n=165, 5%). The full distribution of Pandemic Covid-19 articles across subject areas is shownin Fig. 2.

According to VOSViewer, the articles were published in 159 different journals. The highest number of articles were published in Frontiers In Psychology, with 47 publications, followed by Iop Conference Series Earth and Environmental Science (n=43), Journal of Physics Conference Series (n=40), Frontiers In Public Health (n=37), and International Journal of Environmental Research and Public Health (n=33). The other most productive journals with the most publications are shown in Table 1.

Table 1 The most production journals based on the number of publications

Rank	Source Title	No. Of Publication	Country
1st	Frontiers In Psychology	47	Switzerland
2nd	Iop Conference Series Earth and Environmental Science	43	United Kingdom
3rd	Journal of Physics Conference Series	40	United Kingdom
4th	Frontiers In Public Health	37	Switzerland
5th	International Journal of Environmental Research and Public Health	33	Switzerland
6th	Frontiers In Psychiatry	31	Switzerland
7th	Sustainability Switzerland	31	Switzerland
8th	Plos One	26	United States

9th	Open Access Macedonian Journal of Medical Sciences	11	Macedonia
10th	Frontiers in Medicine	10	Switzerland
11th	International Journal of Current Research and Review	10	India
12th	E3s Web Of Conferences	9	France
13th	Heliyon	9	Netherlands
14th	International Journal of Public Health Science	9	Indonesia
15th	Scientific Reports	9	United Kingdom
16th	Frontiers In Education	7	Switzerland
17th	International Journal Of Surgery	7	Netherlands
18th	Chaos Solitons and Fractals	6	United Kingdom
19th	Environmental Chemistry Letters	6	Germany
20th	International Journal Of Advanced Computer Science and Applications	6	United Kingdom

Table 2 lists the most influential authors based on citations recorded by the Scopus database. The most influential author was Nicola et al., (2020), with 2753 citations, followed Fegert et al., (2020) (n=714), González-Sanguino et al., (2020) (n=701), Jamilloux et al., (2020) (n=376), and Liu et al., (2020) (n=321). Table 3 present the influential source (i.e journals) based on cititations. International Journal of Surgery (n=2770) was the most influential journal, followed by Frontiers in Psychiatry (n=571), International Journal of Environment Research and Public Health (n=539), Frontiers in Psychology (n=529), and Sustainability (n=308)

Table 2 The most influential authors and source based on citation analysis.

Rank	Authors	Title	Year	Source title	Cited by
1st	Nicola et al., (2020)	The socio-economic implications of the coronavirus pandemic (COVID-19): A review	2020	International Journal of Surgery	2753
2nd	Fegert et al., (2020)	Challenges and burden of the Coronavirus 2019 (COVID-19) pandemic for child and adolescent mental health: A narrative review to highlight clinical and research needs in the acute phase and the long return to normality	2020	Child and Adolescent Psychiatry and Mental Health	714
3rd	González-Sanguino et al., (2020)	Mental health consequences during the initial stage of the 2020 Coronavirus pandemic (COVID-19) in Spain	2020	Brain, Behavior, and Immunity	701
4th	Jamilloux et al., (2020)	Should we stimulate or suppress immune responses in COVID-19? Cytokine and anti-cytokine interventions	2020	Autoimmunity Reviews	376
5th	Liu et al., (2020)	COVID-19: The first documented coronavirus pandemic in history	2020	Biomedical Journal	321

6th	Phan & Narayan, (2020)	Country Responses and the Reaction of the Stock Market to COVID-19—a Preliminary Exposition	2020	Emerging Markets Finance and Trade	301
7th	Sun & Zhai, (2020)	The efficacy of social distance and ventilation effectiveness in preventing COVID-19 transmission	2020	Sustainable Cities and Society	275
8th	Blake et al., (2020)	Mitigating the psychological impact of covid-19 on healthcare workers: A digital learning package	2020	International Journal of Environmental Research and Public Health	271
9th	Laster Pirtle, (2020)	Racial Capitalism: A Fundamental Cause of Novel Coronavirus (COVID-19) Pandemic Inequities in the United States	2020	Health Education and Behavior	232
10th	Yunus et al., (2020)	COVID-19 and surface water quality: Improved lake water quality during the lockdown	2020	Science of the Total Environment	230
11th	Bell et al., (2020)	Parents' and guardians' views on the acceptability of a future COVID-19 vaccine: A multi-methods study in England	2020	Vaccine	229
12th	Dai et al., (2020)	A Universal Design of Betacoronavirus Vaccines against COVID-19, MERS, and SARS	2020	Cell	223
13th	Zhu et al., (2020)	Multiplex reverse transcription loop-mediated isothermal amplification combined with nanoparticle-based lateral flow biosensor for the diagnosis of COVID-19	2020	Biosensors and Bioelectronics	199
14th	Shin & Kang, (2020)	Reducing perceived health risk to attract hotel customers in the COVID-19 pandemic era: Focused on technology innovation for social distancing and cleanliness	2020	International Journal of Hospitality Management	185
15th	Bhalla et al., (2020)	Opportunities and Challenges for Biosensors and Nanoscale Analytical Tools for Pandemics: COVID-19	2020	ACS Nano	184
16th	Rana et al., (2020)	Mental health of medical workers in Pakistan during the pandemic COVID-19 outbreak	2020	Asian Journal of Psychiatry	183
17th	Gousseff et al., (2020)	Clinical recurrences of COVID-19 symptoms after recovery: Viral relapse, reinfection or inflammatory rebound?	2020	Journal of Infection	164
18th	Schuchat, (2020)	Public health response to the initiation and spread of pandemic Covid-19 in the United States, February 24-April 21, 2020	2020	Morbidity and Mortality Weekly Report	164
19th	Nikolopoulos et al., (2021)	Forecasting and planning during a pandemic: COVID-19 growth rates, supply chain disruptions, and	2021	European Journal of Operational	156

		governmental decisions		Research	
20th	Narayan et al., (2021)	COVID-19 lockdowns, stimulus packages, travel bans, and stock returns	2021	Finance Research Letters	148

Source : Processed by Author

Table 3 The most influential countries and source based on citation analysis.

Rank	Source	Cititations	Country	Quartile
1	International Journal of Surgery	2770	Netherlands	Q1
2	Frontiers in Psychiatry	571	Switzerland	Q1
3	International Journal of Environment Research and Public Health	539	Switzerland	Q1
4	Frontiers in Psychology	529	Switzerland	Q1
5	Sustainability	308	Switzerland	Q1
6	Heliyon	250	Netherlands	Q1
7	Science of The Total Environment	248	Netherlands	Q1
8	Frontiers in Public Health	220	Switzerland	Q1
9	Chaos, Solitons and Fractals	186	United Kingdom	Q1
10	Plos One	185	United States	Q1
11	Air Quality, Atmosphere and Health	178	Netherlands	Q1
12	Journal of Medical Virology	152	United States	Q1
13	Environmental Chemistry Letters	125	Germany	Q1
14	Healthcare	92	Switzerland	Q2
15	Journal of Open Innovation : Technology, Market, and Complexcity	88	Switzerland	Q1
16	Journal of Biomolecular Structure and Dynamics	76	United Kingdom	Q2
17	Frontiers in Medicine	71	Switzerland	Q1
18	Journal of Physics : Conference Series	58	United Kingdom	Q4
19	Journal of Infection in Developing Countries	32	Italy	Q3
20	Peerj	32	United States	Q1

Source : Processed by Author

here were seven journals from Switzerland, five journals from United Kingdom, two journals from Netherlands, and one journals each from United States, Macedonia, India, France, Indonesia, and Germany. In the period 2020 to 2022, United States was the country with the most publications on Pandemic Covid-19, with 260 articles, followed by India with 231 articles.
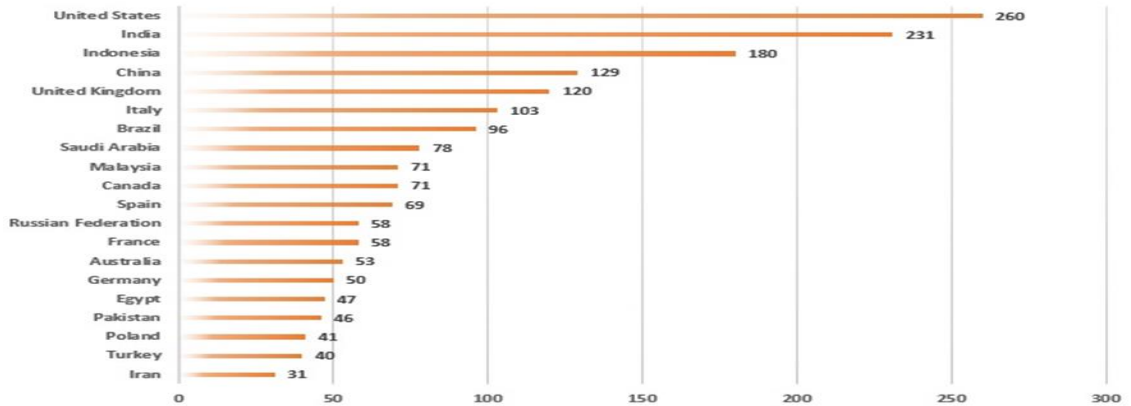
Figure 3 Top 20 countries with publication of pandemic covid-19
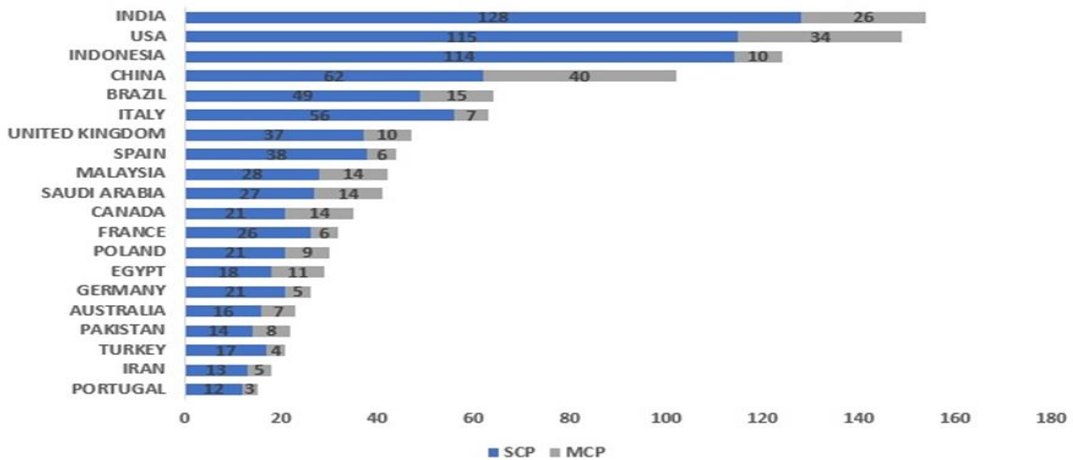
Source : Processed by Authors

Figure 4 Corresponding Authors

Source : Processed by Author

India and Indonesia were the Asian countries ranked in the top 20 countries in terms of the most Pandemic Covid-19 publications. These two Asian countries ranked two and three, respectively. The top 20 countries can be seen in Fig. 3. Fig. 4 shows Corresponding Authors of Pandemic Covid-19. The highest number of articles were India, Followed by USA, and Indonesia.

A content analysis was performed of the 1864 publications sorted by relevance. Next, we performed a co-occurrence analysis with VOSviewer, using the "all keyword" analysis unit and the "full counting" method. We limited the frequence of keyword occurrence to 5 times; out of 1162 keywords VOSviewer found 13112 keywords that met the threshold. The results of this analysis

are presented in Fig. 5.

Covid-19 (1141), Human (816), and Pandemic (708) were the top three keywords that appeared most frequently. Moreover, we found seven clusters in this analysis. Fig. 5 shows these keywords divided into 7 clusters (each with a different number of keywords), which are represented by colors. The first cluster (red, 442 keywords) focused on Covid-19, Pandemic, Human, Corona Virus Disease 2019. The second cluster (green, 279 keywords) centered on Sars-Cov-2, Non Human, Review, Virology, and Procedures. The third cluster (blue, 262 keywords) related to Age, Risk Factor, Retrospective Study, Clinical Article, and Case Report.
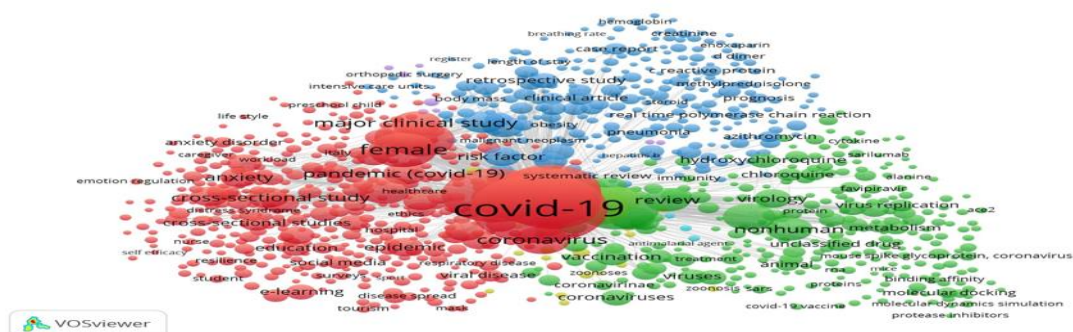

Figure 5 Network visualization of pandemic covid-19 articles published globally in the Scopus database.

Source : Processed by Author

The fourth cluster (yellow, 25 keywords) related to Health Policy, History, Global Health, Contact Tracing, and Influenza Vaccine. The five cluster (purple, 8 keywords) focused on Cause of Death, Elective Surgery, Orthopedics, Sex Factor, and Orthopedics Surgeon. The sixth cluster (light blue, 4 keywords) dealt with anti bacterial agents, antibiotic resistance, antifactive agen, and drug use.
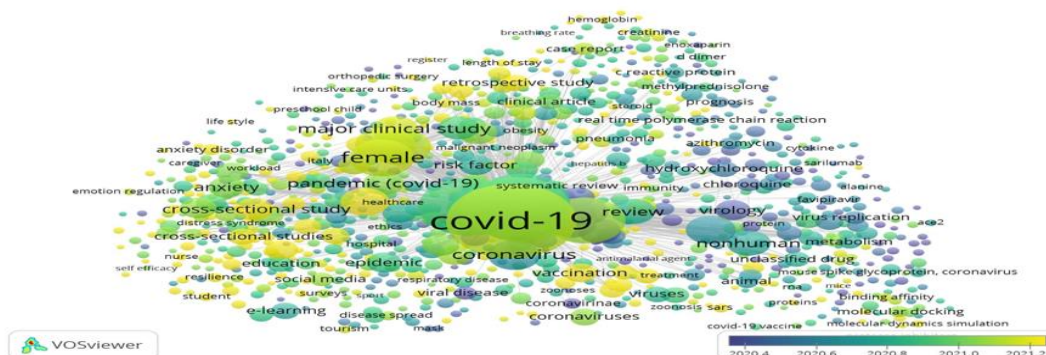

Figure 6 Overlay visualization of global Pandemic Covid-19 articles.

Source : Processed by Author

Fig. 6 shows an overlay visualization of Pandemic Covid-19 literature with the average number of publications from 2020 to 2022. There was a shift in topics; around 2020.6, the literature on Pandemic Covid-19 contained extensive discussions of the terms "coronavirinae", "virology" and "viral disease", and then the last 3 years discussed "restrospective study", "Vaccination", and "Treatment".

Discussion

Based on data from Scopus, the publication trends, journal performance, content analysis, and bibliographic coupling of countries and sources were analysed for research on Pandemic Covid-19 issues throughout the world. The current study focused on articles published in Pandemic Covid-19. This study aimed to provide information on the status of publications in these fields. A total of 1864 studies published were recorded in the scopus database. The data showed the rapidity of article publications and the responsiveness of researchers in analyzing on Pandemic Covid-19 around the world. However, limited research from a global perspective on Pandemic Covid-19 in the past 3 years has discussed "coronavirinae", "virology" and "viral disease"and its relationship with governance within the scope of social science.

Based on Fig. 2, the most productive and influential country was United States followed by India. Although country from Europe dominated the top 20 countries with the most publications by affiliated researchers, India and Indonesia is the country from Asia in the top 20. The current study has limitations, we only retrieved studies from Scopus and did not use other source such as Web of Science, Crossref, or PubMed Central. Finally, we did not use other analyses in VOSviewer, such as co-citation or co-authorship. Thus, we hope that bibliometric research on this topic will expand in terms of the databases used, the subject areas, and the analyses conducted in order to provide a broader overview of the issue.

Conclusion

In the past three years, global research on Pandemic Covid-19 has increased significantly. The theme of research on Pandemic Covid-19 related to policy implementation, and local government could be interesting for future discussions. There are also opportunities to foster discussion about Pandemic Covid-19 in social science journals related to public administration. Finally, Europe dominated this field in terms of publications, while research from Asia on this topic remains limited, and further research is therefore necessary.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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