

A BIBLIOMETRIC ANALYSIS AND VISUALISATION OF RESEARCH TRENDS IN COVID-19 AND SUICIDE

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Abstract

COVID19 is a pandemic caused by SARS COV2. Thus this bibliometric analysis was conducted to understand the active authors, organizations, journals, and countries involved in this research of COVID and suicide. All articles related to COVID-19 and suicide, published in 2020, was analyzed using the VOS viewer to develop analysis tables and visualization maps. This article had set the objective to consolidate the literature regarding COVID-19 and suicide; and also to find out the trends related to the same. The most productive author is Zhang L having the highest average citations and Mamuna M A is the most active author, having the highest number of publications, citations, and co-authorship linkages. The highly productive country in the research of COVID-19 and suicide is Canada with the highest number of average citations. However, the highly active country in the research domain of COVID-19 and suicide is the UK with the highest number of publications, citations, and co-authorship linkages. Brain Behaviour and Immunity is the most active journal with the highest number of citations and average citations. Asian Journal of Psychiatry is the journal with the highest number of publications.

Keywords: COVID, Suicide, Bibliometric analysis, VOS viewer, Pandemic

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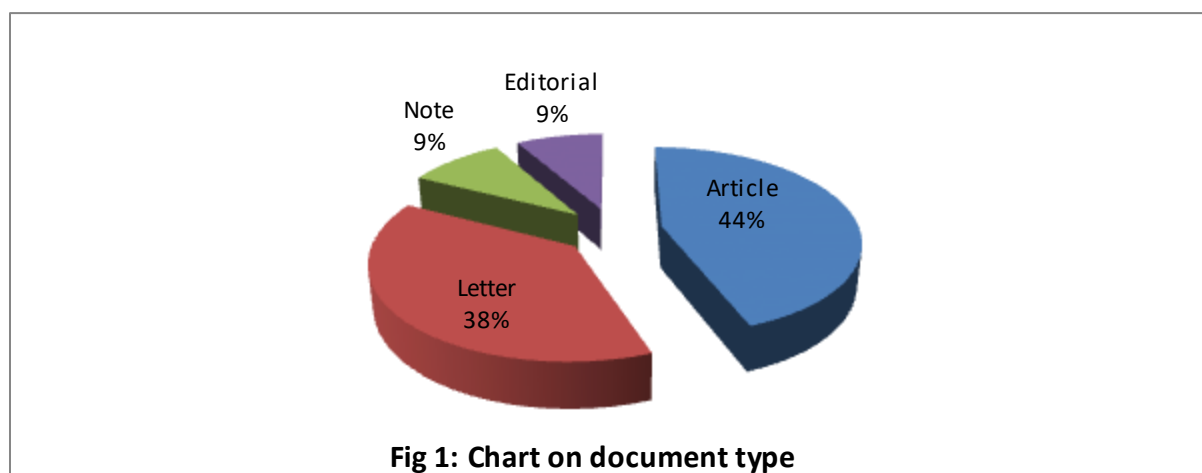
1. Introduction

Coronavirus disease19 (COVID-19) is a pandemic and caused by SARS COV2. COVID19 was first reported in Wuhan, China, and its spread across the world. COVID-19 had reported with a comparatively lower mortality rate but is capable of super spreading and social spreading in a short period. Only Social distancing and self-hygiene can avoid this pandemic at this stage. [1-3] Immunity is very important to control the super spread of the virus. Personal hygiene should include hand washing, use of masks, sanitizer, gloves, and maintaining social distancing. COVID19 is disastrous with people having comorbidities. A higher degree of research is needed to control the pandemic. Hygiene is an important social determinant of health during the pandemic. There is a huge challenge faced in solid waste disposal during the pandemic. Health workers play a great role in stopping the pandemic. Motivations, overwork, risk of infection, job pressure, lack of rotation are the serious problems faced by health care workers in the field. [4-7] Till now the treatments involve drug repurposing and we are miles away from an effective vaccine. Antiviral drugs also play an important role in treating COVID-19 patients. Remdesivir, Favipiravir, Chloroquine, and Lopinavir/Ritonavir have commonly used drugs for treating COVID-19 patients

across the world. This article is arranged in five sections. The first section is the introduction, followed by the discussion of the methodology by which the research was conducted. The third section deals with results and discussion. The fourth section deals with the conclusion. [8-10]

2. Research Methodology

Only the Scopus source was used in this bibliometric analysis. For the article selection, we had used the Boolean “TITLE-ABS (COVID AND SUICIDE) on 25/10/2020. This first round of search produced an outcome of two hundred and forty-four documents, in the English language. The various types of documents and their details are shown in figure 1. We selected only the articles for this review and thus excluded all the other types of documents in this research.



We used all one hundred and one articles (44% of documents) to conduct bibliometric analysis using VOS Viewer. We were inspired by bibliometric analysis in its presentation style, analysis, and methodology from the works.

2.1 Research Objectives

- a) To consolidate the literature regarding COVID-19 and suicide
- b) To find out the trends related to research in COVID-19 and suicide

The following research questions are framed for conducting bibliometric analysis systematically.

2.2 Research Questions

- a) Which are the main journals and articles working related to COVID-19 and suicide?
- b) Which are the main organizations and countries working on COVID-19 and suicide?
- c) Who are the active researchers working on COVID-19 and suicide?

2.3 Methods and tools for evaluation

We used the VOS viewer for conducting bibliometric analysis and visualization. Out of multiple tools available in the VOS viewer, we had used Co-authorship analysis, Co-occurrence analysis, and citation analysis for this research. Co-authorship analysis measures the relatedness of items based on the number of co-authored documents. Co-authorship analysis can be possible with three units of analysis, namely, authors, organizations, and countries. Co-authorship analysis had been conducted by analyzing the number of co-authored documents, citations, and average citations per co-authored documents, links, and link strength to identify the closely related authors in a research area. The items with the highest links and link strength are considered for tracing the most effective researchers, journals, articles, organizations, and countries.^[11-12] Co-occurrence analysis measures the relatedness of items based on the number of documents in which the keywords occur together. Co-occurrence analysis can measure the trends in research. Co-occurrence analysis can be possible with three units of analysis, namely, author keywords, index keywords, and all keywords. The trending keywords and the trend in research are identified by finding out keywords with the highest occurrence and link strength. Citation analysis can be possible with five units of analysis, namely, authors, documents, sources, organizations, and countries. For citation analysis, citations per documents and total citations were used to identify the most effective researchers, journals, articles, organizations, and countries.

3. Results and discussion

Table 1 show the details with active researchers in the domain of COVID-19 and suicide. Co-authorship analysis and citation analysis were used in this research. While taking authors as a unit of analysis for the co-authorship analysis, we have taken the parameters of the minimum number of documents of an author as three and the minimum number of citations of authors as one. This combination plotted the map of twelve thresholds out of eight hundred and seventy authors, in five clusters. The density visualization map of co-authorship analysis plotted in figure 2, points out the major researchers with their strong co-authorship linkages. The major clusters involved in the research with co-authorship can be identified in figure 2. Table 1 makes it clear that the most productive author is Zhang L having the highest average citations and Mamuna M A is the most active author, having the highest number of publications, citations, and co-authorship linkages.

Table 1: Analysis of author activity

Results of Citation analysis				Results of co-authorship analysis (Unit of analysis is authors)	
Authors	Documents	Citations	Average Citations per documents	Authors	Link Strength
Zhang L.	3	135	45.0	Mamun M.A.	9
Mcintyre R.S.	4	148	37.0	Griffiths M.D.	7
Mamun M.A.	11	165	15.0	Chevance A.	7
Griffiths M.D.	8	116	14.5	Leboyer M.	6
Chevance A.	3	34	11.3	Leaune E.	6

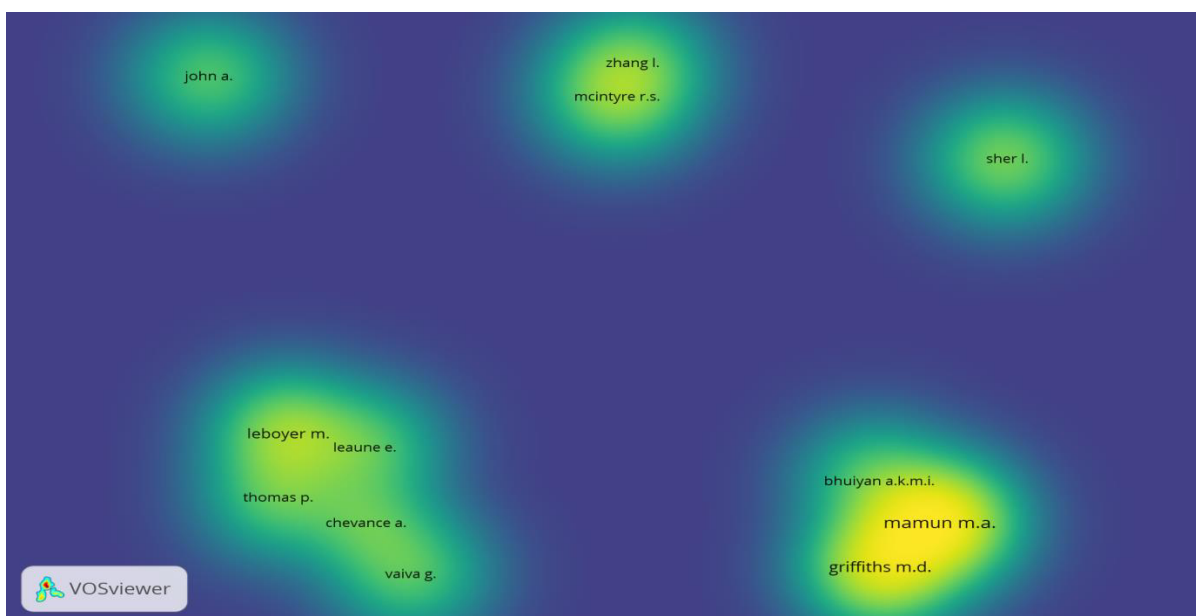


Figure 2: Co-authorship analysis on basis of authors

In Co-occurrence analysis, we had used all keyword analyses, by keeping the minimum number of occurrence of a keyword as sixty-four. This combination plotted the map of seventeen thresholds out of one thousand seven hundred and sixty-nine keywords, in four clusters. The network visualization of co-occurrence analysis using all keywords has been shown in figure 3. Figure three identifies the major keywords associated with suicide and COVID.

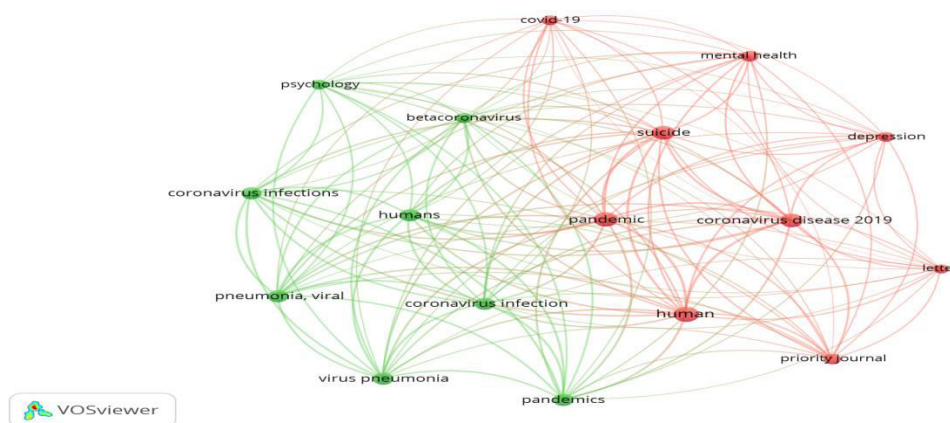


Figure 3: Co-occurrence analysis on basis of all keywords

Table 2 shows the active organizations engaged in research on COVID and suicide. Co-authorship analysis and citation analysis were used in this analysis. While taking organizations as a unit of analysis for the co-authorship analysis, we have taken the parameters of the minimum number of documents of an author as two and the minimum number of citations of organizations as two. This combination plotted the map of thirty thresholds out of seven hundred and forty-eight organizations, in six clusters. The network visualization map of co-authorship analysis plotted in figure 4, points out the major research organizations with their co-authorship links. The major clusters involved in the research with co-authorship can be identified in figure 4. Figure 4 makes it clear that there is a poor linkage between top organizations involved in the research on suicide against COVID. Similarly, leading research organizations in the area of COVID and suicide had been highlighted in table 2.

Table 2: Analysis of Organisations

Organizations	Country	Documents	Citations	Average Citations per document
Alice Lee Centre For Nursing Studies, National University Of Singapore	Singapore	2	135	67.5
Bloomberg School Of Public Health, Johns Hopkins University	USA	2	135	67.5
Department Of Psychological Medicine, National University Health System	Singapore	2	135	67.5
Department Of Psychological Medicine, Yong Loo Lin School Of Medicine, National University Of Singapore	Singapore	2	135	67.5

Faculty Of Education, Huaibei Normal University	China	2	135	67.5
Institute For Health Innovation And Technology (Ihealthtech), National University Of Singapore	Singapore	2	135	67.5
Institute For Preventive Medicine And Public Health, Hanoi Medical University	Vietnam	2	135	67.5
Mood Disorders Psychopharmacology Unit, University Health Network, University Of Toronto	Canada	2	135	67.5
The China-Singapore (Chongqing) Demonstration Initiative On Strategic Connectivity Think Tank	China	2	135	67.5
The First People's Hospital Of Chongqing Liang	China	2	135	67.5

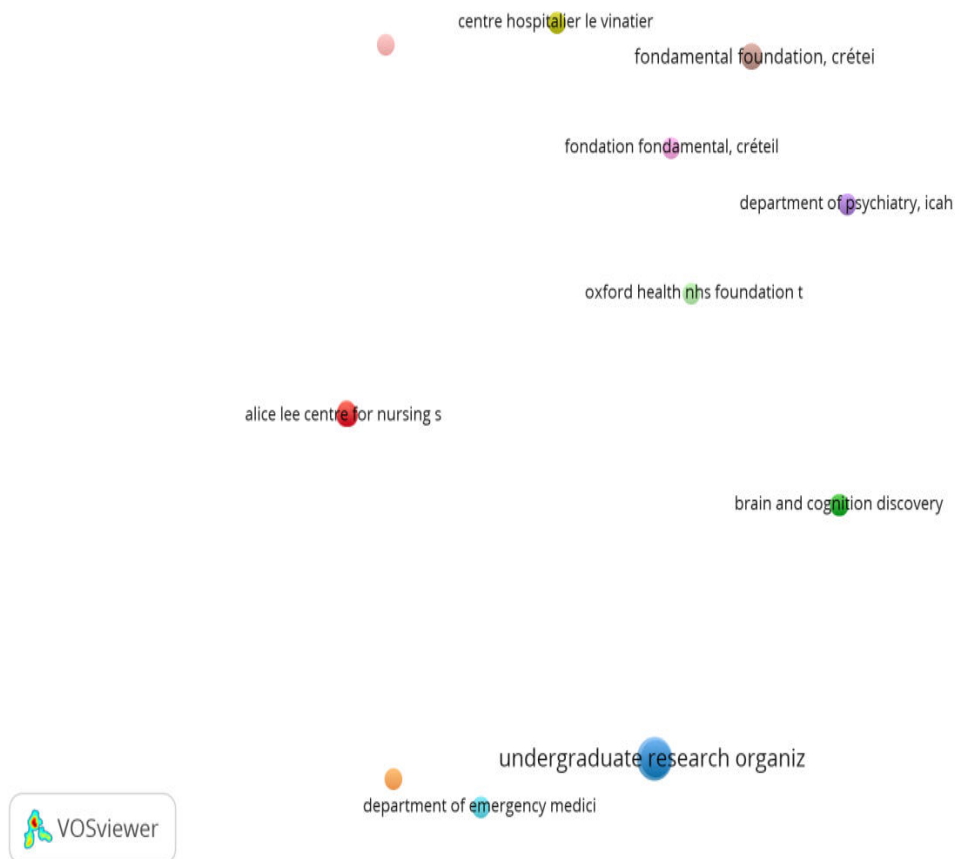


Figure 4: Co-authorship analysis on basis of Organisations

Table 3 shows the countries actively engaged in research on COVID-19 and suicide. Co-authorship analysis and citation analysis were used in this analysis. While taking countries as a unit of analysis for the co-authorship

analysis, we have taken the parameters of the minimum number of documents of a country as ten and the minimum number of citations of a country as two. This combination plotted the map of nine thresholds out of fifty-seven countries in three clusters. The network visualization map of co-authorship analysis plotted in figure 5, points out the major research countries with their co-authorship collaborations. The major clusters involved in the research with co-authorship can be identified in figure 5. Similarly, top countries in the area of COVID-19 and suicide had been highlighted in table 3. From table three it's clear that the highly productive country in the research of COVID-19 and suicide is Canada with the highest number of average citations. However, the highly active country in the research domain of COVID-19 and suicide is the UK with the highest number of publications, citations, and co-authorship linkages.

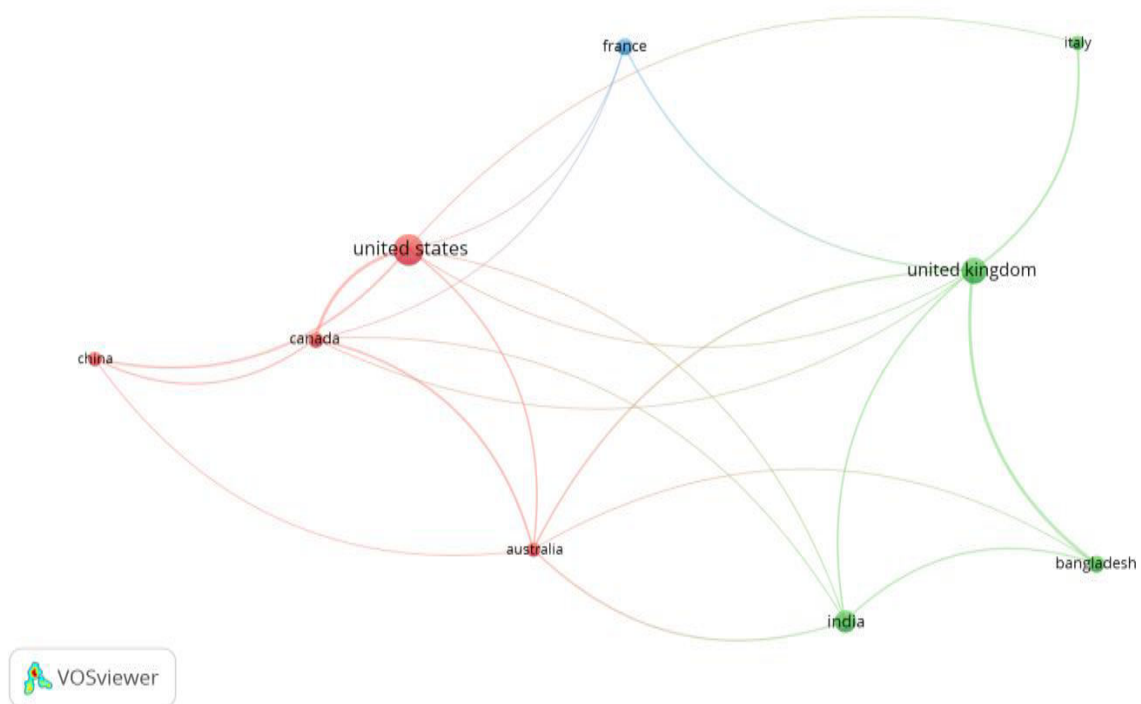


Figure 5: Co-authorship analysis on basis of Country

Table 3: Analysis of activities of countries

Results of Citation analysis				Results of co-authorship analysis (Unit of analysis is countries)		
Country	Documents	Citations	Average Citations per documents	Country	Link Strength	H-Index
Canada	15	173	11.5	United Kingdom	17	1487
China	14	148	10.6	United States	15	2386
Bangladesh	17	170	10.0	Canada	14	1193
Australia	14	116	8.3	Australia	11	1001
United Kingdom	42	344	8.2	Bangladesh	09	202

Table 4 shows the highly cited articles, engaged in research on suicide and COVID-19. Link analysis and citation analysis were used in this analysis. We have taken the parameters of the minimum number of citations as four. This combination plotted the map of fifty-nine thresholds out of two hundred and forty-four documents. The highly cited articles are highlighted in table 4.

Table 4: List of highly cited articles

Articles	Citations	Co-citation Link	Journal and Publisher details	H-Index	Title
Gunnell D. (2020)	99	1	The Lancet Psychiatry, Elsevier Ltd, UK	65	Suicide risk and prevention during the COVID-19 pandemic
Tan W. (2020)	68	0	Brain, Behavior, and Immunity, Academic Press Inc, USA	140	Is returning to work during the COVID-19 pandemic stressful? A study on immediate mental health status and psychoneuroimmunity prevention measures of the Chinese workforce
Hao F. (2020)	67	0	Brain, Behavior, and Immunity, Academic Press Inc, USA	140	Do psychiatric patients experience more psychiatric symptoms during the COVID-19 pandemic and lockdown? A case-control study with service and research implications for immunopsychiatry
Tandon R. (2020)	65	0	Asian Journal of		COVID-19 and mental health: Preserving

			Psychiatry, Elsevier, Netherlands	29	humanity, maintaining sanity, and promoting health
Mamun M.A. (2020c)	63	0	Asian Journal of Psychiatry, Elsevier, Netherlands	29	First COVID-19 suicide case in Bangladesh due to fear of COVID-19 and xenophobia: Possible suicide prevention strategies

Table 5 shows the journals actively engaged in research on COVID-19 and suicide. Link analysis and citation analysis were used in this analysis. We have taken the parameters of the minimum number of documents of a journal as two and the minimum number of citations of a journal as one. This combination plotted the map of thirty-one thresholds out of one hundred and thirty-three journals. Brain Behavior and Immunity is the most active journal with the highest number of citations and average citations. Asian Journal of Psychiatry is the journal with the highest number of publications.

Table 5: Analysis of journal activity

Journals	Documents	Citations	Average Citations per documents	H-Index	Publisher
Brain, Behavior, and Immunity	7	248	35.4	140	Academic Press Inc., USA
The Lancet Psychiatry	8	165	20.6	65	Elsevier Ltd, UK
The BMJ	3	59	19.7	412	BMJ Publishing Group, UK
International Journal of Mental Health and Addiction	2	33	16.5	39	Springer New York, USA
Journal of Clinical Psychiatry	2	32	16.0	199	Physicians Postgraduate Press Inc., USA

4. Conclusion

By analyzing the results from the analysis by using VOS viewer and discussion in the above section, we

conclude that the most active authors are from China. The most productive author is Zhang L having the highest average citations and Mamuna M A is the most active author, having the highest number of publications, citations, and co-authorship linkages. The highly productive country in the research of COVID-19 and suicide is Canada with the highest number of average citations. However, the highly active country in the research domain of COVID and suicide is the UK with the highest number of publications, citations, and co-authorship linkages. Brain Behavior and Immunity is the most active journal with the highest number of citations and average citations. Asian Journal of Psychiatry is the journal with the highest number of publications.

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