Profiling COVID-19 research in the social sciences from Indonesia based on Scopus database

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ABSTRACT
This study provides insights into the pattern of COVID-19 research publications in Indonesia and aims to map out the contributions of social science scholars in the country during the pandemic, using bibliometric analysis. The analysis was conducted through desk research using the scientometric method from the Scopus database, with a total of 1,037 articles analysed. The research found that social sciences scholars in Indonesia made significant contributions to the fields of online learning, economics, business and management, public health and administration, and communication and media studies. The study also identified the influences of research areas, funding, open access, female first author, female co-authors, and international collaborative research on quartile and the number of citations. The implications of the study suggest that efforts should be made to promote gender diversity in research, allocate research funding appropriately, and encourage international collaboration. Authors should prioritize publishing in high quartile journals and opt for open access publication. Additionally, academic institutions and funding agencies should provide guidance on selecting reputable journals to maintain a culture of quality research.

Keywords: Scientometrics; COVID-19 research; Social science research; Bibliometrics analysis; Indonesia.

INTRODUCTION

The COVID-19 pandemic has disrupted the global economy and community and altered the way people live and work (Akudjedu et al. 2021; Cascella et al. 2020; Jowell and Barry 2020). On the other hand, the pandemic provides room for reflections by creating opportunities for humans to rebuild civilization in a better way. Science has been the main feedstock for creating policies to tackle the COVID-19 pandemic (Djalante et al. 2020; Li, Goerlandt, and Reniers 2021; Maccaro et al. 2021; Mouter, Hernandez, and Itten 2021). Specifically, medical and health sciences has been a research field that stands at the forefront and holds a central role in responding to the COVID-19 pandemic (Leask et al. 2021; Radanliev, De Roure and Walton 2020; Scally, Jacobson and Abbasi 2020). Subsequently, social sciences also play their role to ensure the implementation of these policies, as well as efforts for long term recovery (Fakhruddin, Blanchard and Ragupathy 2020; Pratici and Singer 2021; Pulido et al. 2020). Undoubtedly, social sciences neither

produce a significant amount of patentable “widgets” nor come up with lifesaving vaccines (Middlemass 2020), however, the analyses and insights generated by social science research are able to help and guide exact sciences to be more accurate in handling the COVID-19 pandemic (Ho, Fu and McKay 2021; Zhang and Shaw 2020). The quote "There is no use in conducting lockdowns or developing vaccines without public willingness and obedience" (Middlemass 2020) highlights the importance of public cooperation and compliance in the effectiveness of public health interventions. This emphasizes the role of social science scholars in collaborating with STEM scholars and policymakers to develop practical and feasible solutions that are more likely to be accepted and followed by the general public. As an example, social science scholars provide indications about the delivery of COVID-19 vaccination programmes, inform about human institutions, relations, and behaviours (Dada et al. 2021; Pratici and Singer 2021). Social scientists also play a crucial role in ensuring that people’s voices are incorporated in discussions and that stakeholders are aware of the need to pay attention to their concerns. Ownership to support inclusivity is most important for developing a sustainable recovery strategy.

The COVID-19 pandemic is a calamity for some scholars, obstructing them from planning various scientific development activities and forcing them to rearrange even devise strategies to adjust with the characteristics of COVID-19. On the other hand, various kinds of research were produced from differing perspectives, which have been carried out since the onset of the pandemic, particularly in medical and social sciences (Golan, Jernegan and Linkov 2020; Jayaraj et al. 2020; Li and Eryong 2021). This is coupled by a rapid growth in the number of publications concerning COVID-19 (Haafza et al. 2021; Leitner et al. 2022; Rahmani and Mirmahaleh 2021). In response to the progress of knowledge and science during the pandemic, COVID-19 related development and research patterns had been identified in scientometric studies (Haq, Raza and Malik 2020; Shakeel et al. 2021). Subsequently, the most productive countries, and the emergence of international scientific collaborations on COVID-19 had also been revealed in systematic review of research (Chen and Duffy 2021; Shakeel et al. 2021). These studies specifically discuss the development of science and knowledge for combating the COVID-19 pandemic, especially in medical sciences, which generated findings on clinical features, pathological findings, and therapeutic design (Shakeel et al. 2021). Another study discusses about disease treatment, protein spike, and vaccine (Lu et al. 2020).

The main focus of attention on various fields of exact sciences raises a particular question, i.e., what is the contribution of social sciences in handling the COVID-19 pandemic, particularly in developing countries such as Indonesia. Several literature have identified why Indonesia-based social scientists were less productive than exact scientists (Achwan et al. 2020; Gaus et al. 2020). It should be admitted that exact sciences receive greater acknowledgement and budget allocation than social sciences (or non exact sciences) do (Gaus et al. 2020). Scholars in exact sciences are even directly supported by industries that believe in the importance of research and development for more optimal benefit or profit. This, surely, has resulted in a higher number of exact science related studies compared to social sciences. A study found that doctorate holders in soft sciences, i.e., sciences not involving any mathematical process, are no less productive than those in hard sciences (involving mathematical process) (Gaus et al. 2020). Accordingly, international collaborations have an effect on publication and research productivity. Another study found that those researchers having a social science background do not have a lot of collaboration opportunities and if there is any impact caused by the publication of their research, it is not much greater than that of the exact sciences (Achwan et al. 2020).

Unfortunately, these studies merely focus on productivity, while contributions from social sciences in specific cases such as the COVID-19 pandemic have not been discussed.

The objective of this paper is to address this gap by examining trends in academic publications related to COVID-19 as a body of work in social sciences, and by examining specific topics within these COVID-19 related publications. The research question addressed in this study is "Which domain of social sciences have been majorly discussed in COVID-19 related research from 2020 to mid-2022?". The present study also focused on analysing the COVID-19 research themes that have been significantly explored by social scientists in Indonesia.

LITERATURE REVIEW

Perspectives on the Scientific Publication in Social Sciences by Social Scientists

The production of scientific publication and scientific knowledge has been and continues to be given considerable attention by universities throughout the world. This, subsequently, becomes a measure constituting the quality of higher education institutions, aside from its pedagogy and contribution to the development of local communities. Efforts to promote such productivity have, subsequently, become an integrated part of the vigorous attempts at reform carried out by higher education institutions in Asia, Latin America, and Europe. This is packaged in a gamification model for competing and achieving excellence, which drives lecturers to become obsessed in submitting publications (Achwan et al. 2020). In Indonesia, this is also associated with performance measures of individuals, higher education institutions, and has even become a prerequisite for certain functional positions, such as professorship.

Some perspectives were conceived to understand this phenomenon. The first is academic capitalism (Achwan et al. 2020), where transfer of authority occurs from universities as sources of knowledge to third parties, such as academic publishers, to take on the role as a source of scientific knowledge (Stewart 2020). Scientific knowledge is produced by scientists and faculty members at universities, published by other institutions, and when they want to access said knowledge, they are required to pay for those scientific articles. In addition, scientific publication does not come cheap, particularly for academic communities in developing countries.

The next perspective is academic dependency (Achwan 2017). This occurs because the production of social sciences in developing countries are very dependent on scholars of leading universities in Europe, the United States, and Australia. High impact journals are in their hands or in the hands of academicians coming from leading universities, who eventually control research questions, theories, and methodologies in social sciences. In other words, academic dependency leads to social scientists in peripheral countries and universities being conditioned by other more dominant entities. This is challenged by several universities developing non-paid journals and publishing research in their own repositories, but it seems such efforts have yet to bear significant results.

Social Sciences and Scientists and their Contributions to the COVID-19 Pandemic

During the COVID-19 pandemic, scholars have an ethical obligation to continue doing their main research work in order to provide evidences for the various problems and inquiries relating to how the pandemic can be addressed. Social scientists are most familiar with qualitative research, which by design is able to record social responses to the COVID-19

pandemic (Alam and Chu 2020; Chadha 2021). This method is able to reveal how individuals overcome and understand health and disease as well as explain, plan, and handle crisis situations in accordance with their culture. Unfortunately, in order to contribute, social scientists encountered new obstacles, e.g., difficulty in carrying out field research (Barei-Guyot 2021). For that, the key is interdisciplinary collaboration to address complex issues as it allows deeper understanding.

The COVID-19 pandemic, on the other hand, functions as a break from the highly busy routines that researchers and academicians had to endure. This, perhaps, will also contribute to productive scientific publication and will, on the other hand, drive social scientists to reflect upon the scientific contributions they made under such state of crisis (Alam and Chu 2020). This momentum should be captured and leveraged to instill better research practices. It can be done by seriously taking over knowledge by focusing on civilians to be involved in policy changes.

In practice, behavioural and social scientists have been mobilized to study the impacts of the COVID-19 pandemic. Among the topics that emerged include the impact of the COVID-19 pandemic on social connectedness, connection and isolation as well as social vulnerability (Bentlage et al. 2020; Pratici and Singer 2021). Furthermore, there are also studies about risk perception, use of media, stress and protective behaviours. The findings in these studies may contribute to handling the COVID-19 pandemic, especially if they are able to correlate scientific evidence with policies relating to the handling of the COVID-19 pandemic. Various studies contributed by social sciences had been conducted, particularly in Western countries that allocate substantial resources and have strong political will for the development of social sciences (Dada et al. 2021; Li, Goerlandt, and Reniers 2021; Pratici and Singer 2021). Unfortunately, although several studies on the contribution of social sciences to life in developing countries are available, researchers mostly focused on publication and productivity, analysing why scholars in exact sciences are more productive in terms of scientific publication.

MATERIALS AND METHOD

Scientometric analysis was carried out in the current study, which included investigating collaborations and scientific impacts of current research topics (Alcaide Muñoz et al. 2014; van Eck and Waltman 2017) to answer the question of what contributions were made by social sciences and social scientists in Indonesia for handling the COVID-19 pandemic in the country. Scientometric mapping in this study was done to produce an extensive perspective on divisions of social research on COVID-19 (Li, Yuan and Zhu 2021).

The data for this study was generated from Elsevier's Scopus database as of June 2022.. Scopus has been chosen because it one of the largest citation databases of peer-reviewed literature, with strength in inter-disciplinary feature, covering indexed journals that have been reviewed and edited rigorously by professionals with deep understanding of particular fields of science (Pranckutė 2021; Singh et al. 2021). To produce comprehensive findings the following keywords were used: "(AFFILCOUNTRY (indonesia)) AND (covid-19) AND (LIMIT-TO (SUBJAREA , "SOCI")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (DOCTYPE , "ar"))", which subsequently resulted in 1,037 scientific documents published in various Scopus-indexed journals from 2020 to mid-2022. The scope and inclusion search criteria and results are presented in Table 1. The search was conducted on June 18, 2022.

VOSViewer (van Eck and Waltman 2010) application was used to develop and visualize the scientific networks. The CSV file, which contains a metadata of 1,037 scientific articles, was inserted in this application. The output obtained by using this application focused on three things, namely: citation relation, appearance of similar words, and authorship collaborative relation (Singh et al. 2021). Citation relation produced findings in the form of interconnected themes that focus on direct citation, combining references, and joint citation relation. Analysis on the appearance of similar words can be used to identify emerging research topics and trends by examining certain words or phrases in titles, abstracts, or keywords. Lastly, analysis on authorship reflects social structure, and social relation looks at the degree of collaborative authorship to subsequently inform analyses on authors, institutions, and regions. Effects between research area, funding, female first author, female co-authors, international collaborative research and quartile as well as the effects between research area, quartile, funding, open access, female first author, female co-authors, international collaborative research and citation quantity are also tested. Accordingly, we used Pearson's chi-squared analysis with a $p<0.05$ level of significance.

Table 1: Scope and Inclusion Criteria

Scope	Inclusion Criteria	No. of documents
Indonesia	Only including studies with affiliation to Indonesia, not about Indonesia	5,963
Social Science	Only focusing on social sciences, not including other sciences such as medicine, environmental science, energy, nursing and so forth	1,289
Year 2020, 2021, 2022	Only studies published from 2020 to mid-2022 when the search was conducted	1,037

RESULTS

The findings of this study are divided into two parts. The first part describes the profile of each particular category such as year, area, quartile, citation, funding, open access, gender of first author, and female co-authors. The second part reports on the journals that are most frequently targeted by Indonesian authors, and articles that garnered the most citations, as well as research area or clusters based on the keywords found from the 1,037 publications identified.The subsequent section contains the cross-tabulation and Pearson's chi-squared test. The final part of the article elaborates the clusterization of certain research themes.

The Profile of Indonesian Social Science Contribution to COVID-19 Research

Table 2 describes the profile of the 1,037 articles that are included in the present study. In terms of publication year, most of the articles were published in 2021 (588, 56.7%), which was a fourfold increase from 2020 (147, 14.2%). An article was found published in 2019, which might had been published to meet the lack of quota in the previous year, or it might had also been related with the quality of the intended journal. In 2022, as of June 18th, there were as many as 301 articles, and this number may still continue to rise for that year. The profile by area of research is also presented. Although the focus of this study is social sciences, there are numerous articles coming from multidisciplinary fields. The highest field in COVID-19 social science publication was education (348, 33.6%), followed by the field of economics, business and management (149, 14.4%). There were as many as 128 articles

(12.3%) from the field of public health. The social science fields with few articles were cultural studies (22, 2.1%) and environment (7, 0.7%).

Table 2: The Profile of Indonesian Social Science Contribution to COVID-19 Research

Profile attributes	Frequency	Percentage
Year		
2019	1	.1
2020	147	14.2
2021	588	56.7
2022	301	29.0
Research Area		
Education	348	33.6
Economics, business and management	149	14.4
Public Health	128	12.3
Public policy and administration	117	11.3
Sociology	95	9.2
Communication and media studies	56	5.4
Psychology	42	4.1
Law	40	3.9
Language	33	3.2
Cultural studies	22	2.1
Environment	7	.7
Quartile ranking		
Discontinued	131	12.6
No Quartile	34	3.3
Quartile 1 (Q1)	232	22.4
Quartile 2 (Q2)	259	25.0
Quartile 3 (Q3)	260	25.1
Quartile 4 (Q4)	121	11.7
Citation		
0	578	55.7
<10	392	37.8
10-50	59	5.7
51-100	5	.5
>100	3	.3
Funding information		
No funding	843	81.3
With funding	194	18.7
Open Access		
No	326	31.4
Yes	711	68.6
Gender of first author		
Female	405	39.1
Male	632	60.9
Female co-author		
No	358	34.5
Yes	679	65.5
International collaborative paper		
No	856	82.5
Yes	181	17.5
Type of collaboration		
Collaboration between Indonesian institutions	348	33.6
Cross-country collaboration	196	18.9
Single Indonesian institution	493	47.5
Indonesian as first author		
No	89	8.6
Yes	948	91.4

Regarding the scientific impact of the journals publishing Indonesian COVID-19 social science research, there is a good indication that many social scientists published their articles in high quartile journals - i.e. 232 (22.4%), 259 (25%), and 260 (25.1%) articles were published in Q1, Q2, and Q3 journals respectively. Meanwhile, 121 articles (11.7%) found their home in Q4 journals. Nevertheless, it was found that 131 (12.6%) articles were published in journals with discontinued status. A total of 34 journal articles (3.3%) were published in journals that were recently indexed, thus do not have an impact score.

Citation has a significant function in measuring the impact of journal articles. Upon observation of the citations, more than half of the collected articles (578, 55.7%) in this study have not been cited at all at the point of data collection. There were only 3 articles (0.3%) that had been cited more than 100 times and 5 articles (0.5%) that had been cited between 51 and 100 times. A total of 59 articles (5.7%) had been cited between 10 and 50 times. Meanwhile, 37.8 percent had been cited less than 10 times. The low citation garnered may be due to the short citation time window used for articles published in 2020 and 2021, to be assessed in 2022. Moreover, citation rates are heavily dependent on the discipline and the number of people working in that area, as well as the characteristic of the paper, such as being inter-disciplinary and collaborative.

Since research funding and open access publishing have been hot topics in academic productivity, the funding information and open access status of each publication were also identified. Only 194 articles (18.7%) were funded publications, and the remaining 843 articles (81.3%) did not specify any sources of funding or were from non-funded research. The social scientists seemed to favour open access with 711 articles (68.6%) on COVID-19 compared to articles under paywall (326, 31.4%). This aligns with Indonesia's 2019 Law on National Knowledge System and Technology that requires the implementation of open access licences for research publications to ensure the public can access and use the results of research[1]. The pandemic too may provide authors the opportunity to make their article open access without paying for article publication charges (APC) in making the research results freely accessible to the broader public.

Co-authorship is viewed as a valid indicator for scientific collaboration in research publications. Author-level analyses was performed to compare the numbers and shares of authorships, leaderships in publications and gender composition and type of collaboration. As expected females' first authorship was lesser (405, 39.1%) than that of males' first authorship (632, 65.5%). It was also observed that there was gender imbalance in terms of the differences in the shares of authorships - a total of 358 journal articles (34.5%) were published without involving female authors, although a higher percentage (679, 65.5%) did have the share of female authorships. In terms of collaboration types, three organizational collaborative approaches emerged, i.e., (a) cross-country or international collaboration, (b) collaboration between two or more Indonesian institutions, and (c) collaboration between two or more departments within an Indonesian institution. There were 196 papers (18.9%) authored with international collaborators, and 348 institutional collaborative papers (33.6%) with Indonesian counterparts. There was a strong tendency towards intradepartmental collaborations as most of the COVID-19 social science publications (493, 47.5%) came from single Indonesian institution.

[1] See The Conversation. 2020. Indonesia publishes the most open-access journals in the world: what it means for local research. Available at: https://theconversation.com/indonesia-publishes-the-most-open-access-journals-in-the-world-what-it-means-for-local-research-147421

Pearson's chi-squared analysis with p<0.05 level of significance was conducted to test the effect of certain variables in cross-tabulation analysis (Table 3). It was found that research area, funding, open access, female first author, international collaborative research all have an effect on journal quartile, while female co-authorship does not. Subsequently, it was found that quartile, open access, female first author, female co-authorship, and international collaborative research have an effect on the number of citations. Meanwhile, it was found that research area and funding have no effect on the number of citations of COVID-19 social science publications in this study.

Table 3: Pearson's Chi-Squared Analysis (p<0.05)

Variables	Journal quartile	Number of citations
Research Area	0.000	0.777
Journal quartile	-	0.000
Funding	0.000	0.564
Open access	-	0.000
Female first author	0.038	0.018
Female co-authorship	0.104	0.031
International collaborative research	0.000	0.000

Journal Destination

The top ten journals publishing social science COVID-19 research affiliated to Indonesia is listed in Table 4, ranging from 15 to 52 papers with a total of 262 papers. This revealed that about 25 percent of the papers were published in these ten journals. Unfortunately, out of these journals targeted for publication by Indonesian authors, there of them had been discontinued in 2021 - *Review of International Geographical Education Online, Library Philosophy and Practice*, and *Indian Journal of Forensic Medicine and Toxicology*. Two journals (*Sustainability*, and the *International Journal of Data and Network Science)* had a good CiteScore above 2. The remaining four journals had an average CiteScore, *International Journal of Public Health Science*, the *Cypriot Journal of Educational Sciences, Pharmacy Education*, and the *International Journal of Human Movement and Sports Sciences*. It is considered that papers published in indexed journals with high impact score are likely to have a higher research impact in the form of citation, compared to papers published or low impact journals. This may explain the uncitedness of more than half of the articles (578, 55.7%) in this study.

Table 4: Top Ten Journals where COVID-19 Social Science Publications with at least an Indonesian Institution Affiliation

No	Journal title	2019	2020	2021	Number of documents
1	*Review of International Geographical Education Online*	0.3	0.6	NA*	52
2	*International Journal of Public Health Science*	NA	0	0.4	51
3	*Sustainability*	3.2	3.9	5.0	42
4	*International Journal of Health Sciences*	NA	NA	2.0	18
5	*Library Philosophy and Practice*	0.3	0.4	NA*	18
6	*Cypriot Journal of Educational Sciences*	0.4	0.8	1.1	17
7	*Pharmacy Education*	0.4	0.7	0.5	17
8	*International Journal of Data and Network Science*	NA	3.9	2.7	16
9	*International Journal of Human Movement and Sports Sciences*	0.1	0.3	1.2	16
10	*Indian Journal of Forensic Medicine and Toxicology*	0.1	0.1	NA*	15

* Discontinued

The top ten most-cited articles on COVID-19 by social science researchers from Indonesia were analysed and presented in Table 5. It was found that nine of the most-cited articles were the results of international as well as domestic inter-institutional collaborations. Only one most-cited article was written by a single author. This indicates the significance of collaboration to garner citation of scientific publication.

Table 5: Top 10 Most-Cited COVID-19 Social Science Publications from Indonesia

No	Document Title (Year of publication)	Authors	Journal Title (CiteScore 2021)	Total citation
1	Review and analysis of current responses to COVID-19 in Indonesia: Period of January to March 2020 (2020)	Djalante R., Lassa J., Setiamarga D., Sudjatma A., Indrawan M., Haryanto B., Mahfud C., Sinapoy M.S., Djalante S., Rafliana I., Gunawan L.A., Surtiari G.A.K., Warsilah H.	*Progress in Disaster Science* (7.2)	268
2	Secondary school mathematics teachers' views on e-learning implementation barriers during the COVID-19 pandemic: The case of Indonesia (2020)	Mailizar, Almanthari A., Maulina S., Bruce S.	*Eurasia Journal of Mathematics, Science and Technology Education* (4.4)	172
3	The perceptions of primary school teachers of online learning during the covid-19 pandemic period: A case study in Indonesia (2020)	Rasmitadila, Aliyyah R.R., Rachmadtullah R., Samsudin A., Syaodih E., Nurtanto M., Tambunan A.R.S.	*Journal of Ethnic and Cultural Studies (*2.9)	161
4	Student perspective of classroom and distance learning during COVID-19 pandemic in the undergraduate dental study program Universitas Indonesia (2020)	Amir L.R., Tanti I., Maharani D.A., Wimardhani Y.S., Julia V., Sulijaya B., Puspitawati R.	*BMC Medical Education* (3.7)	86
5	Identifying digital transformation paths in the business model of SMEs during the covid-19 pandemic (2020)	Priyono A., Moin A., Putri V.N.A.O.	*Journal of Open Innovation: Technology, Market, and Complexity* (5.1)	84
6	Government support to airlines in the aftermath of the COVID-19 pandemic (2020)	Abate M., Christidis P., Purwanto A.J.	*Journal of Air Transport Management* (8.2)	62
7	Clinical frailty scale and mortality in COVID-19: A systematic review and dose-response meta-analysis: Clinical Frailty Scale in COVID-19 (2021)	Pranata R., Henrina J., Lim M.A., Lawrensia S., Yonas E., Vania R., Huang I., Lukito A.A., Suastika K., Kuswardhani R.A.T., Setiati S.	*Archives of Gerontology and Geriatrics* (5.3)	60
8	The emergency remote learning experience of university students in Indonesia amidst the COVID-19 crisis (2020)	Rahiem M.D.H.	*International Journal of Learning, Teaching and Educational Research* (1.1)	58
9	Factors affecting customer satisfaction and loyalty in online food delivery service during the COVID-19 pandemic: Its relation with open innovation (2021)	Prasetyo Y.T., Tanto H., Mariyanto M., Hanjaya C., Young M.N., Persada S.F., Miraja B.A., Redi A.A.N.P.	*Journal of Open Innovation: Technology, Market, and Complexity* (5.1)	42
10	Usage of social media during the pandemic: Seeking support and awareness about COVID-19 through social media platforms (2020)	Saud M., Mashud M., Ida R.	Journal of Public Affairs (2.6)	37

Major topics of interest in the top 10 most-cited articles were education (4 articles) and digital transformation in business (3 articles) (Table 5). It was ideal that most-cited papers were published in journals with high CiteScore (above 3.0). Only one most-cited paper was published in a journal with an average CiteScore (1.1), which was single-authored. Again, this reaffirms the importance of inter-institutional collaboration, both domestic and international.

COVID-19 Social Science Research Areas

Research area or clusters based on the keywords found from the 1,037 publications were identified. Four distinct clusters emerged from the keywords co-occurrences network, obtained from VOSviewer (Figure 1) namely online learning (Cluster 1, red); economics, business and management (Cluster 2, dark blue); health policy and administration (Cluster 3, purple); and communication and media studies (Cluster 4, green). Table 6 lists the keywords associated with each cluster.

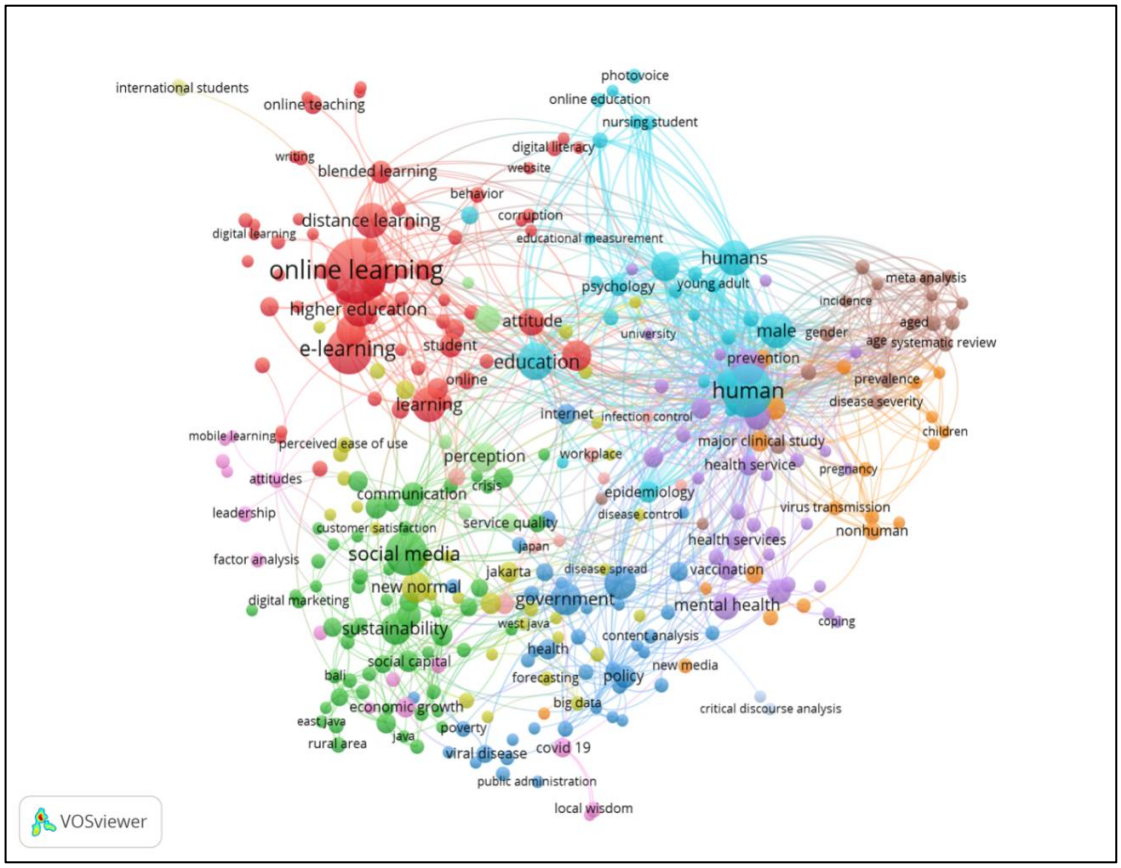

Figure 1: Research Clusters Emerged from COVID-19 Social Science Publications from Indonesia

Online learning is a cluster that saw considerable development in education during the pandemic, covering keywords such as readiness, impacts, and use of online learning in certain fields such as health, sports, and languages. It also explored the use of digital tools such as WhatsApp, Zoom, Google Classroom, and learning management system, and learning models such as project-based learning and hybrid learning. Economics, business, and management cluster covers studies from the world of marketing, particularly involving the application of e-commerce and digital marketing during the pandemic. Health policy

and administration cluster covers public health, public management, governance, participation, and regulation. Communication and media studies cluster generated themes such as social media, hoax, information, online news, and risk communication.

Table 6: Keywords Associated with Each Research Cluster of COVID-19 Social Science Publications from Indonesia

Cluster (Topic)	List of keywords co-occurrences
Cluster 1 (Online learning)	Attitude, behaviour, blended learning, digital learning, digital literacy, distance learning, e-learning, Edmodo, EFL, elementary school, emergency remote learning, emergency remote teaching, football, gamification, google classroom, higher education, hybrid learning, ICT, Islamic education, knowledge, language learning, learning, learning from home, learning management system, learning media, learning motivation, learning outcomes, LMS, online learning, online teaching, physical education, physical fitness, project-based learning, school from home, self-regulated learning, student, teacher, teacher readiness, teaching and learning, technology acceptance model, undergraduate students, website, WhatsApp, writing, zoom
Cluster 2 (Economic, business and management)	Business, business sustainability, competitiveness, communication, digital marketing, e-commerce, economic impact, ecotourism, empowerment, financial performance, income, innovation, manufacturing, marketing performance, MSEMS, national park, small and medium-sized enterprise, strategic approach, strategy, supply chain management, sustainability, tourism, tourism development, tourism market, travel behaviour,
Cluster 3 (Health policy and administration)	ASEAN, crisis management, fiscal policy, food security, good governance, governance approach, health, health policy, infectious disease, law local government, local participation, policy, policy analysis, public administration, public health, public policy, regulation, religion,
Cluster 4 (Communication and media studies)	Social media, hoax, mass media, internet, information, big data, media, new media, risk communication, digital literacy, information dissemination, online news

DISCUSSION

This study is aimed at mapping out the contribution of social science scholars in Indonesia in research on COVID-19 based on the 1,037 articles published in Scopus indexed journals from 2020 to mid-2022. The bibliometrics data provided some insights into the variables that influenced publication activity among the social scientists. The study found that there are effects between international collaboration and journal quartile and between international collaboration and the number of citations garnered. These findings confirm prior studies indicating that international collaboration in humanities and social sciences significantly affects productivity and impact (Cheng et al. 2021; Dusdal and Powell 2021; Koshkin and Novikov 2018). This study also confirms that the more collaborators involved, the better authors are able to improve their publication list as a whole.

The study's findings highlight the under-representation of female researchers in scientific publishing during the pandemic. Female researchers were found to have lower participation rates as major contributors and collaborated less frequently with their male colleagues. Interestingly, the study also found a correlation between a female author's position (first author or co-author) and the journal quartile or number of citations garnered. Female authors tend to cite themselves more frequently than male authors do,

and articles written by female authors also tend to cite women more often (Fowler and Aksnes 2007; Mulyanto et al. 2000). This could potentially explain why female authors have a higher number of citations, as men are citing their own work and that of other women more frequently (King et al. 2017). It is worth noting that men tend to publish more papers, especially earlier in their careers, which could explain why they have more work to cite (King et al. 2017). These findings suggest that more efforts should be made to encourage and support female researchers in scientific publishing, including promoting greater collaboration with male colleagues and enhancing opportunities for citation and recognition.

Funding plays an important role in publishing in high quartile journals (Jung et al. 2017; Sandstrom and Heyman 2016), and also evidenced by the study's findings that suggest a correlation between funding and the number of citations and journal quartile. Previous studies, especially in the medical field have also highlighted funding as one of the determinants of the quality of medical journals. Conversely, lack of funding can lead to deficiencies in methodology (Ebadi and Schiffauerova 2015; Reed et al. 2008) which can affect the quality of research output. Proper funding also enables the publication of articles in open access journals, which are accessible to all, contributing to the broader dissemination of research findings. Moreover, the study also supports previous studies that links the number of citations with the publication type (Morillo 2020; Vílchez-Román and Vara-Horna 2021), indicating that open access publication is likely to receive more citations than non-open access publications.

The current study revealed that research areas have a impact on both the quartile and the number of citations. This could be attributed to the need for different scientific disciplines to promote better practices in handling COVID-19 during the pandemic (Liu, Yuan and Zhu 2022; Nasir et al. 2020; Piccarozzi, Silvestri and Morganti 2021). For instance, in education management, there is a critical need to pursue evidence-based research to improve management practices in the education sector (Reyes-Chua et al. 2020; Sunoto, Su'Ad and Ismaya 2021; Visvanathan 2020) which has undergone significant transformations during the pandemic. Similarly, other disciplines such as economics, business, and management also require assistance in transitioning from conventional to digital business practices (Nasir et al. 2020; Piccarozzi, Silvestri and Morganti 2021). In some cases, the need to draw practices from developing countries could explain the higher citations rates in these areas (Nasir et al. 2020). Overall, the findings suggest that interdisciplinary collaboration is crucial in addressing the challenges posed by the COVID-19 pandemic and promoting better practices across various fields.

In contrast to Liu, Yuan, and Zhu's (2022) study which identified six major themes, namely public health; literacy and health education; telemedicine; mental health and psychology; social media and infodemic; physical activity and prison reform; the current focused on four clusters social science COVID-19 papers that were primarily authored by Indonesian researchers. These cluster include online learning; economics, business, and management; health policy and administration; and communication and media studies. Additionally, while Liu, Yuan, and Zhu (2022) found that the most developed social science research cluster was the public health cluster, the current study found that the most developed cluster in Indonesia was online learning. These findings highlight the unique research priorities and needs of different countries, and the importance of tailoring research efforts to address specific challenges and contexts.

The study findings are consistent with the number of academic programmes in Indonesia, which stands at 6,032 (21%) according to the *Direktorat Jenderal Pendidikan Tinggi* (2020). Specifically, it was found that online learning research cluster received significant attention, with studies exploring the process of transition from offline to online learning across different scientific fields and levels of education, from elementary to higher education. While online learning was not identified as the most significant in Liu, Yuan, and Zhu's (2022) study, they also found that COVID-19 had a significant impact on education, forcing many students to rely on remote learning due to school closures. This study also aligns with prior studies that identified keyword such as e-learning, higher education, university, blended learning and online learning in their investigations (Aristovnik, Ravšelj and Umek 2020; Nasir et al. 2020), highlighting the importance of digital technology in improving students' learning experience during the pandemic. Overall, this study underscores the need to prioritize research efforts that align with the unique needs and challenges of specific countries, such as the prevalence of education programmes in Indonesia.

In addition, the communication and media studies cluster in this study also focused on the role of different media platforms in disseminating information related to COVID-19. It is not surprising that communication and media studies have emerged as an important area of research during the pandemic, consistent with Liu, Yuan, and Zhu's (2022) which identified the social media and infodemic cluster in social science research on COVID-19. However at the same time, numerous fake news and misinformation have been disseminated through social media, which has caused harm and panic among the public. This has attracted the attention of many researchers to research on hoax and digital literacy as demonstrated in this study and that of Baber et al. (2022).

In contrast to Liu, Yuan, and Zhu's (2022) who found that ethics, racism, and health equity were the most raised topics in the public health cluster, this study discovered that the public health cluster in Indonesia focused more on health policy, health governance and public health administration. This finding is in line with previous studies that emphasized the importance of effective policies and and governance in managing public health during the pandemic (Aristovnik, Ravšelj, and Umek 2020; Sheikh et al. 2021; Singh and Verma 2021). By addressing these issues, it is expected that the government and public health institutions can better respond to the challenges brought by the pandemic and provide better healthcare services to the country.

It is interesting to note that the findings from this study suggest a different trend compared to Liu, Yuan, and Zhu's (2022), indicating that the economics, business and management cluster was quite developed. This suggests that academic researchers in Indonesia may be more focused on exploring the impacts of the COVID-19 pandemic on business and management practices, with a particular focus on digital transformation and sustainability, e-commerce and digital marketing. It is also noteworthy that studies in this cluster have explored consumer behaviour, which is important for businesses to understand in order to adapt to changing market conditions brought about by the pandemic. The findings from this study are consistent with a study by Piccarozzi, Silvestri, and Morganti (2021), which also found that the research areas of digital transformation, digitalization, and consumption behaviour were developing in the field of management. In addition, the research in the field of tourism has shown significant development, covering a wide range of topics from travel behaviour to ecotourism. Overall, the development of the economics, business and management cluster highlights the importance of understanding the impacts of the pandemic on businesses and the economy, and how businesses can adapt to the changing landscape.

CONCLUSIONS

The study aimed to examine the extent to which Indonesian social science scholars have contributed to COVID-19 research, as reflected in their publications indexed in Scopus between 2020 and mid-2022. The findings suggest that social sciences researchers in Indonesia have made significant contributions to various fields including online learning; economics, business, and management; public health and administration; as well as communication and media studies.

The study also revealed that funding, open access, female first author, female co-authors and international collaboration had an impact on the research output quality, reflected through the journal quartile. Additionally, the number of citations was found to be influenced by journal quartile, open access, female first author, female co-authors and international collaboration. These results highlight the importance of various attributes in determining the quality and impact of social science research output on COVID-19.

The findings of this study have several implications for researchers, funders, and academic institutions. Firstly, to improve the quality of publications in high quartile journals, authors should consider selecting certain areas of research. Research funders such as government agencies should also allocate research funds accordingly, as funding has a direct impact on the quality of targeted journals. Moreover, the position of female first authors can also affect the quartile level of scientific journals, so efforts should be made to promote gender diversity in research.

Secondly, in order to increase the number of citations, authors should choose high quartile journals and opt for open access publication. Collaborating with female authors, either as a first author or collaborator, can also increase the number of citations. Additionally, the study highlights the need to enhance the number of journal articles written through international collaboration. Furthermore, this study emphasises the importance of assistance in selecting targeted journals. Social science researchers may have a tendency to choose suspicious journals with uncertain status, which could negatively impact their academic reputation. In some cases, promotion to certain functional positions such as professorship requires publication in reputable journals indexed in Scopus or Web of Science. Therefore, academic institutions and funding agencies should provide guidance to researchers on selecting reputable journals and promote a culture of quality review processes.

One limitation of the current research is its reliance solely on documents from the Scopus database to collect social science research publications on COVID-19. Although Scopus is a comprehensive database, other research databases such as Web of Science and Dimensions could reveal contradictory results that may enrich the research findings. In future studies, using multiple databases could help address this limitation. Another limitation is the relatively short research period, which may have resulted in some journal articles not being cited or being cited in unpublished articles. While this limitation could not be fully addressed in the current study, future research can extend the duration of the research period to include a more comprehensive selection of literature. Finally, the current research did not focus on the unique research methodology of social sciences. Future studies could examine this aspect and highlight the specific methodological approaches used in social science research on COVID-19. By doing so, this could add another layer of depth to the research findings.

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AUTHOR DECLARATION

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