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COVID-19 research in management: An updated bibliometric analysis

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A B S T R A C T
The unprecedented impact of COVID-19 on the global economy as well as on the academic literature. Since early 2020, management researchers have made exceptional efforts to extend our understanding of the pandemic’s effect on consumption, sourcing, the workplace, and corporate strategies. The present study uses a bibliometric design to analyze the extensive database of COVID-19 studies in management literature generated over a 2-year period. The analysis focused on the performance of research constituents, thematic analysis of the literature, categorization of the themes at a societal, organizational, and individual level, and finally, a deep analysis of future research calls in the body of literature.

1. Introduction

The COVID-19 pandemic is an unparalleled global human health crisis endangering the economic health of individuals and businesses, large and small (Buera, Fattal-Jaef, Hopenhayn, Neumeyer, & Shin, 2021). Firms face unprecedented challenges, such as the need to overhaul traditional business models, the vulnerability of supply chains, and workforce productivity measures (The Economist, 2021). The length of the crisis is transforming consumer behavior with a preponderant shift to online shopping, spending over 211 billion dollars on online platforms in the second quarter of 2020 (Morgan, 2021). These economy-wide shocks have seen a response by the academy with an unprecedented increase in research. This study shows that close to 8,000 scholarly works are published in management journals between early 2020 through the end of 2021. Across all disciplines, researchers have responded by investigating the impact of this pandemic on the macro-economy (e.g., Uddin, Chowdhury, Anderson, & Chaudhuri, 2021), service industry (e.g., Dube, Nhamo, & Chikodzi, 2021), supply chains (e.g., Remko, 2020), innovation (e.g., Ebersberger & Kuckertz, 2021), consumer behaviors (e.g., Eger, Komářková, Egerová, & Mičík, 2021), and employment (e.g., Aguilis, Villamor, & Gabriel, 2020) among many others.

The bibliometric study of Verma and Gustafsson (2020) provided an early overview of the growing literature by analyzing 107 management papers through May 2020. Since, scholars have shown particular interest in studying emerging topics that are largely overlooked in previous literature reviews, such as consumer emotional responses to the pandemic (Chen et al., 2021), electronic commerce (Kumar, Lim, Pan, & Westland, 2021), employees’ psychological wellbeing, and use of artificial intelligence (Goodell, Kumar, Lim, & Pattanaka, 2021). Further, the scope of research has expanded to new sets of problems as the consequences of the outbreak unfolded over time. For example, as the prospect of returning to “normal” appeared to be closer, a forward-looking stream of research on COVID-19 examines the research questions related to the post-COVID-19 business environment and consumer purchase behaviors (e.g., Donghu & Gustafsson, 2020). Additional salient topics such as include resistance to vaccinations (Chaney & Lee, 2021), the tsunami of employee turnover (Bfquim, Park, Back, de Souza Meira, & Hight, 2021), gender and racial inequality (Peck, 2021), localization of supply chains (Ciravegna & Michaelova, 2022) and work-from-home policies (Khan, 2021) were absent from early pandemic research but found resonance as the pandemic faded and surged repeatedly. However, such crucial developments in the business literature were not included in the previous reviews in the early stages of COVID-19.

Almost two years after the publication of Verma and Gustafsson (2020), the lack of an updated bibliometric literature review is of concern given the extensive body of research (Lim, Rasul, Kumar, & Ala, 2021; Paul, Lim, O’Cass, Hao, & Bresciani, 2021). Despite the dramatic expansion in the literature, the full extent of the scholarly works in the management field has not been covered through a systematic synthesis (Lim, 2021). What has become the most impactful research? What
research journal or author within specific a discipline is having the most significant impact? Although reviewing a body of literature is unwarranted in traditional terms after less than 24 months of discovery or focus, the volume, velocity, and breadth of the research are indeed sufficient and necessitate an additional review. Another limitation at this point is the lack of a focused review of the research topics and themes that have emerged in this literature. This, too, is necessary to map the literature but also to provide some order to future research to reduce unnecessary redundancy. Third, the current literature lacks of synthesis based on the level of analysis. What is the level of analysis and impact of the literature to date? What themes are emerging at different levels of analysis? Again, this is due to the speed and volume of research that has been conducted in such a short time.

The future of research in management-related fields focusing on the long-term effects and mitigation of such future events has also not been thoroughly examined. The early suggestions for research may or may not have been accomplished. However, the more pertinent question that can be addressed relates to what themes and levels of analysis are the calls for research focusing on. Are the pandemic impacts classified at a level of abstraction or analysis to allow for a deeper understanding? At this point, no. Although various studies have looked at specific topical areas, a broader mapping or categorization at different levels of analysis has not been systematically addressed during this blizzard of research.

The present study addresses these four existing limitations focusing on research on the impact of COVID-19 in the management field. This study systematically synthesizes scholarly findings on COVID-19 in the business and management disciplines and updates previous literature reviews. In particular, we fill the gaps by delivering on three main study goals. First, we focus on the performance analysis of research constituents to find the most influential authors, papers, and journals across business disciplines. This analysis provides a view of the breadth and depth of the literature. The study’s findings reveal an explosion in the number of COVID-19 studies published in 2020, increasing from 1,782 to 6,211 papers in 2021. Second, we aim to uncover the development of the research themes since the start of the pandemic. We adopt a bibliometric analysis approach that provides a quantitative examination of existing literature’s trends and critical research topics (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021; Donthu, Kumar, & Pattnaik, 2020; Mortazavi, Eslami, Hajikhani, & Väätänen, 2021). We derive the themes of the years 2020 and 2021 and analyze them comparatively. This comparison provides valuable insight into the literature since issues of businesses and managers have altered during the past two years as the pandemic unfolds. An overall thematic comparison of articles published in 2020 with works published in 2021 reveals three broad trends. A primary trend shows exploratory, qualitative, and conceptual research in 2020, while articles in 2021 have shown significant interest in empirical methodologies in their research settings. Additionally, 2020 research focused on companies’, employees’, and consumers’ experiences and coping with the COVID-19 pandemic while 2021 articles indicate that this trend has gradually shifted toward accepting new norms in the workplace and business environment. Further, we observe more advanced data collection and analysis methodologies in 2021 compared to research published in 2020. For instance, methods such as text mining, natural language processing, and machine learning were widely used by researchers in 2021 as more data became available for the public.

The third goal of this study is to pave the way for future investigations by uncovering research opportunities. We coded the future research direction and implication sections of studies and conducted content analysis methods to reveal the concepts and themes that researchers suggest as future research directions. The analysis shows that organizational resilience, supply chain resilience, consumer cooperative
behavior, employee turnover, risk perception, and racial and gender inequality are crucial research topics for future academic endeavors. This third goal also includes categorization of the literature at three levels of impact and analysis. This categorization at the societal, organizational, and individual levels allows us to extract broader themes that affect each level of abstraction. This contributes to our deeper understanding of the body of knowledge and allows researchers to see opportunities to further refine and expand the bodies of knowledge at each level.

The remainder of this study is organized as follows. Section 2 explains the methodology and focuses on the research design and the data collection procedure. The third section explains the performance analysis and findings related to the current state of the management literature with the most impactful papers, authors, and journals. This is followed in Section 4 with the extraction, categorization, and brief insights into key research themes in 2020 and 2021. To understand existing calls for future research, Section 5 provides an analytical grouping of research calls in the existing Covid-19 research in the broad management field. This is followed by a conclusion.

2. Methodology

The bibliometric method of reviewing literature utilizes information sourced from published studies in a discipline and provides insight into the performance of research constituents (e.g., papers, researchers, journals, authors, universities, countries, etc.) and the structure of the knowledge in the focal area (Ferreira et al., 2014; Donthu, Kumar, Mukherjee, et al., 2021; Mortazavi et al., 2021). The method also assists researchers by identifying new perspectives for future research directions and has been applied to summarize previous findings in important research topics, including key-account management (Kumar, Sharma, & Salo, 2019), business-to-business marketing (Backhaus, Lügger, & Koch, 2011), and strategic-management research (Ramos-Rodriguez & Ruiz-Navaarro, 2004).

Our method includes three steps to conduct the present bibliometric study reflected in Fig. 1, and following the suggestions of earlier bibliometric works (e.g., Donthu, Kumar, Mukherjee, et al., 2021). The first step is the collection of relevant English language studies by searching keywords in the Web of Science and Scopus databases with a focus on business and management. Next, the second step is a performance analysis evaluating the contributions of research constituents (authors, journals, institutions, and countries) using bibliometric packages (Donthu, Kumar, Mukherjee, et al., 2021). The third and final step uses science mapping methods, utilizing co-word and textual analysis to identify research themes. These analytical techniques were also used to extract and categorize future research directions.

We searched the Web of Science and Scopus databases following the procedure of Verma and Gustafsson (2020). We identified articles using the following keywords: “2019-ncov” OR “COVID-19” OR “Coronavirus Disease 2019” OR “Novel Coronavirus Pneumonia” OR “NCP” OR “SARS-Cov-2” OR “2019 Novel Coronavirus” OR “2019 Novel Coronavirus diseases” OR “Novel coronavirus” OR “pneumonia”. The academic journal article titles, abstracts, and keywords were searched from January 1, 2020, to December 27, 2021. The initial search resulted in 240,398 and 291,812 articles respectively. We then refined the database articles published in peer-reviewed journals in the subject areas of business, management, or accounting. Based on these criteria, the number of studies on the Web of Science decreased to 4,691 and, in Scopus, to 6,374 articles. We combined the two databases and removed duplicates using the Bibliometrix package in R (Aria & Cuccurullo, 2017), resulting in 7,993 articles. These studies were then the basis for the performance analysis. The profile of this database is provided in Table 1.

Thematic analysis and the extraction of future research directions followed Donthu, Kumar, Pandey, Pandey, and Mishra (2021) by restricting the included journals to those ranked 3 or higher in the CABS ranking resulting in a smaller database of 1181 papers. We conducted a co-word analysis of the author keywords to find the clusters in the years 2020 and 2021. For the study of future research directions, the procedure of Lim et al. (2021) was followed which searched and extracted content from the future research directions and implications section of papers. Leximancer was used for text analysis. The performance analysis and science mapping details follow.

| Table 1 | Descriptive Statistic of Performance Analysis Database. |
|---------|-------------------------------------------------------|
| Total publications | 7993 |
| Number of publications 2020 | 1785 |
| Number of publications 2021 | 4807 |
| Number of publications 2022 | 155 |
| Number of early access articles | 1246 |
| Number of journals | 1134 |
| Number of countries | 123 |
| Number of contributing authors | 17,070 |
| Average citations | 5.89 |
| Number of Single-authored publications | 1515 |
| Collaboration index | 2.43 |
| Proportion of cited publications | % 53.96 |

Note: a = Numbers show the total number of citations in Google Scholar.

| Table 2 | The Most Influential Papers, Authors, and Journals across Business Disciplines. |
|---------|--------------------------------------------------------------------------------|
| Discipline | No. of Studies a | Most Influential Papers | Total Citations | Most Influential Author h-index | Most Influential Journal h-index |
| Accounting | 446 | Blundell et al. (2020) | 518 | Xu & Costada 3 | Fiscal Studies 8 |
| Business and International Management | 1661 | Chenbrough (2020) | 347 | Vanessa Ratten 5 | Industrial Marketing Management 10 |
| Finance | 1252 | Zhang, Hu, and Ji, (2020) | 1335 | Afees Salisu 6 | Finance Research Letters 28 |
| Management Information Systems | 369 | Dwivedi et al. (2020) | 497 | Kieran Conboy 3 | International Journal of Information Management 21 |
| Management of Technology and Innovation | 876 | Kuckertz et al. (2020) | 621 | Victor Chang 3 | Technological Forecasting and Social Change 12 |
| Marketing | 769 | He and Harris (2020) | 895 | Junglesan Kim 5 | Journal of Business Research 17 |
| Organizational Behavior and Human Resource Management | 521 | Dirani et al. (2020) | 259 | Mark Loewenstein & Matthew Dey 3 | Journal of Contextual Behavioral Science 9 |
| Strategy and Management | 2315 | Dryhurst et al. (2020) | 983 | Dimitry Ivanov 6 | Journal of Air Transport Management 17 |
| Tourism, Leisure and Hospitality Management | 1194 | Gisling et al. (2020) | 2801 | Colin Michael Hall 5 | Tourism Geographies 23 |
3. Performance analysis

Performance analysis assesses the contributions of research constituents and their impact on the field (Donthu, Kumar, Mukherjee, et al., 2021). We evaluated the performance of research constituents across business disciplines using the journal list by Scimago Country & Journal Ranking (SJR) (e.g., Tiberius, Siglow, & Sendra-Garcia, 2020; Donthu et al., 2020). SJR’s categorization for Business Management and Accounting, consists of 9 disciplines. These categories are not mutually exclusive as disciplines might have conceptual overlap. We then created a sub-database for each discipline and conducted performance analysis to find the most influential authors, papers, and journals. The number of global citations (Google Scholar) was the criteria to determine the most influential authors. To find the most influential authors and journals in each discipline, we used the local h-index which relies only on the articles and citations within our curated database. Categories and counts are presented in Table 2.

3.1. Studies across business disciplines

The total number of articles in this database was 7993. The field of “Strategy and Management” with 2315 papers, poses the highest number of studies followed by “Business and International Management” and “Finance” with 1661 and 1252 articles, respectively. The number of articles per the remaining field are: “Tourism, Leisure and Hospitality Management” (1194), “Management of Technology and Innovation” (876), “Marketing” (769), “Organizational Behavior and Human Resources Management” (521), “Accounting” (446), and “Management Information Systems” (369).

3.2. Most impactful papers

We reported the most impactful papers in each business discipline based on the global citation count. The results show that in “Accounting,” the work of Blundell, Costa Dias, Joyce, and Xu (2020) has the highest number of citations. In “Finance,” Zhang, Hu, and Ji (2020) study with 1335 citations is the most widely-cited paper. The study of Chesbrough (2020) has been cited 347 times and has the most impact in the field of “Business and International Management.” Among the studies in the field of “Management Information Systems,” the most cited article was by Dwivedi et al. (2020) with 497 citations, while in “Marketing” and “Management of Technology and Innovation,” the studies of He and Harris (2020) with 895 and Kuckertz et al. (2020) with 621 have the most impact respectively. In “Organizational Behavior and Human Resources Management,” the study of Dirani et al. (2020) with 259 citations, in “Strategy and Management” the work of Dryhurst et al. (2020) with 983 citations and the work of Gössling, Scott, and Hall (2020) with 2801 citations in “Tourism, Leisure, and Hospitality Management” are the most influential papers.

3.3. Most impactful authors

The most influential author in each field is determined by assessing the highest local h-index. The results in Table 2 indicate that Xu and Costada with 3 have the highest impact in the field of “Accounting.” Vanessa Ratten (h-index of 5), Afees Salisu (h-index of 6), and Kieren Conboy (h-index of 3) have the highest impact in the fields of “Business and International management,” “Finance,” and “Management Information Systems.” In “Management of Technology and Innovation,” Victor Chang has an h-index of 3; in “Marketing,” Jungkuen Kim has an h-index of 5; in “Organizational Behavior and Human Resources management,” Mark Lawrenswenstein and Mathew Dey have an h-index of 3; and in “Strategy and Management,” Dimitry Ivanov has an h-index of 6. These are the most influential authors in the aforementioned fields. Lastly, the most influential author in “Tourism, Leisure and Hospitality Management” is Colin Michael Hall, with an h-index of 5.

3.4. Most impactful journals

The most impactful journal in each field was identified using the local h-index. In “Accounting,” Fiscal Studies with an h-index of 8 is the most impactful publication while Industrial Marketing Management with an h-index of 10 has the highest impact in “Business and International Management.” Finance Research Letters with h-index of 28 in “Finance,” International Journal of Information Management with h-index of 21, and Technological Forecasting and Social Change with h-index of 12 in the area of “Management of Technology and Innovation” have the highest impact. The most influential journals in “Marketing,” “Organizational Behavior and Human Resources Management,” and “Strategy and Management,” are Journal of Business Research with an h-index of 17, Journal of Contextual Behavioral Science with an h-index of 9, and Journal of Air Transport Management with h-index of 17, respectively. Lastly, Tourism Geographies with h-index of 23 is the most impactful journal in the field of “Tourism, Leisure, and Hospitality Management.”

4. Research themes

The second goal of the study was to demonstrate the academic development of the COVID-19 scholarly works in the management literature by categorizing articles into meaningful research themes. Bibliometric studies frequently shortlist articles into a core list of high-quality papers and employ clustering approaches to uncover themes. This shortlist was achieved by refining the studies following the Donthu, Kumar, Pandey, et al. (2021) approach and including only studies published in journals with a score of 3 or above in the CABS journal ranking. According to CABS, rank 3 journals are considered highly regarded publications in business literature, rank 4 journals publish the most original and best-executed research, and rank 4 journals are worldwide recognized publications exemplars of excellence. We did not use citation-based methods to identify high-quality papers because research on the effects of COVID-19 on businesses and individuals was limited to less than a two-year period at the time of our data collection. Thus, a substantial number of studies may be high quality but have received zero or minimum citations in this short period, even though the volume of research has been substantial.

Our analysis of the literature development was conducted by dividing the articles into two groups: studies published in 2020 and studies published in 2021. The reasons for this separation of articles are threefold. First, the evolution of the literature on the impacts of COVID-19 has been swift, and thus, shorter periods make more sense for uncovering the developments of the literature. In fact, the effects of the pandemic on the economy, businesses, and human interactions have been profound (e.g., Lazzini, Lazzini, Balluchi, & Maza, 2021; Kallenskoski & Pablonia, 2021), and consequently, significant resources have been invested in a short period of time in studying how COVID-19 has impacted businesses, resulting in an impressive body of scholarly publications since 2020. Second, since the beginning of the pandemic, the focus of studies has constantly changed, which requires shorter periods for studying the development of the literature. For example, within the past two years the availability of vaccines, the shift in government policies related to COVID-19, and the panic-stricken reactions of individuals catalyzed change in strategies and responses, forcing researchers to update the focus of their studies (e.g., Yost & Cheng, 2021; He & Harris, 2020). Lastly, including all research published between 2020 and 2021 in a single thematic analysis hinders the identification of niche research topics in the final results. Therefore, we divide the database of articles into the shortest possible period, one year.

Co-word analysis was used to derive research themes from the articles in the 2020 and 2021 core lists (e.g., Rejas-Lamorona, Del Barrio-García, & Alcántara-Pilar, 2022). This analysis identifies research themes by examining co-occurrence of words that appeared in the articles’ title, abstract, or keywords and helps us understand the words’ entirety and their relationships (Van Eck & Waltman, 2010). Co-word
results were achieved using VOSviewer software focusing on co-occurrence of author keywords to identify the themes (e.g., Verma & Gustafsson, 2020). VOSviewer creates a co-word network of all keywords and categorizes them into clusters. These clusters are reviewed to find research themes in the literature. Before running the analysis, the keywords were manually refined to reach a unified and consistent database. For example, keywords such as “Coronavirus” and “N-Sars-Cov-2” were replaced with “COVID-19” to create a consistent list of keywords in our database. We focused on keywords used at least two times in the database when the minimum cluster size is set to three. Fig. 2 provides the co-word networks of the author keywords used at least two times in the core databases of the year 2020 and 2021.

The co-word analysis of article keywords illuminates ten and fourteen research themes for 2020 and 2021 publications, respectively. The strength of the ties among keywords, the measure used to evaluate conceptual closeness, is measured based on the co-occurrence of the words in the dataset. Further, nodes and edges in the same color imply being categorized into one research theme. To backtrack from author keywords in each cluster to themes, we filtered the core database using the keywords in each cluster and analyzed the papers to understand the gist of a cluster and label the themes of each cluster (Verma & Gustafsson, 2020). The largest cluster of keywords in 2020 has 7 keywords and 46 articles, while the largest cluster in 2021 has 18 keywords and 52 studies. Table 3 outlines the themes, keywords, and examples of studies for each theme in 2020 and 2021.

Research themes are categorized based on the three levels of analysis: Societal, Organization, and Individual (e.g., Van Wijk, Zietsma, Dorado, De Bakker, & Marti, 2019; Podsakoff, Whiting, Podsakoff, & Blume, 2009; Wilke & Ritter, 2006). Research on the impact of COVID-19 on business and management has been conducted in a variety of business disciplines and at different levels of analysis, and much of this work is not systematically integrated. This categorization is provided to enhance clarity and order to the literature. Societal level themes contain topics related to the overall impacts of COVID-19 on the economy,
governments, and public policies. Themes related to firms’ strategies and supply chain issues are summarized at the organization level. Finally, individual-level themes include categories of research on employees’ wellbeing and consumers’ reaction to the pandemic.

4.1. Societal level

4.1.1. Research themes 2020

Three key themes emerged at the societal level: Human Casualties, Public Policy, and Public Leadership, and Information Distribution. The following section we summarize scholarly works published in 2020 in each of the themes followed by the thematic extraction for the 2021 research.

4.1.1.1. Human Casualties. The Human Casualties theme estimates the magnitude of COVID-19 deaths, analyze the pandemic’s economic side effects, and models the spread of the virus in different communities. For example, using the statistical life valuation method, Viscusi (2020) estimates that the mortality cost associated with COVID-19 in the U.S. will exceed 3.5 trillion dollars by July 2020 and proposes that morbidity outcomes in 2020, the estimated costs
of pandemic risk for the residents of tourist-attracting locations ranged from 128 million dollars in Hong Kong to 223 million dollars in Guangzhou.

4.1.1.2. Public policy and public leadership. Our findings indicate that scholars paid special attention to how local and federal governments have responded to the pandemic in mitigating death rates, sustaining the health system, and managing potential consequences of COVID-19 among communities (e.g., Weng, Ni, Ho, & Zhong, 2020; Sakurai & Chughtai, 2020; Jamieson, 2020; Hatcher, 2020; Kaplan, 2020). Examples of keywords in this theme are Public Governance, Emergency Management, Public Disasters. Weng et al. (2020) compared how local leaders in Shanghai and Los Angeles responded to the pandemic. They find four tension points at the public policy level: immediacy versus thoroughness, transparency versus secrecy and security, centralization versus decentralization, and state-driven solutions versus coproduction. Hatcher (2020) and Kaplan (2020) model a state government’s public health decisions and emphasize the importance of the federal and local government’s swift decisions in the early stage of public crisis. Sakurai and Chughtai (2020) compare other natural disasters with the COVID-19 pandemic and suggest that fostering resiliency in society helps individuals manage unknown risks and uncertainties during the pandemic.

4.1.1.3. Information distribution. This theme summarized studies highlighting the importance of information and misinformation distribution during the pandemic (e.g., Li, Chandra, & Kapucu, 2020; Leclercq-Vandelannoitte & Aroles, 2020; Laato, Islam, Islam, & Whelan, 2020). These studies intend to examine how (mis)information spread in societies and various ways that public leaders can diminish the adverse effects of misinformation at the time of crisis. Li et al. (2020) scrutinize the role of government in reducing information asymmetry during the COVID-19 outbreak in China. They show that cooperation between government institutions reduces information overload and asymmetry of information distribution among residents.

4.1.2. Research themes 2021

The results summarized in Table 3 show that, in 2021, research themes at the societal level focus on the Impacts on the Economy, Labor Market, Public Policy, Education System, and Sustainable Development. Comparing the findings to 2020 research themes, the results indicate that Public Policy is the sole overlapping theme across 2020 and 2021. The following section outlines the details of the research themes in 2021 at the societal level.

4.1.2.1. Impacts on economy. The co-word analysis of 2021 articles at the societal level shows that many scholars have continued studying COVID-19 disruptions on the economy, financial markets, and labor market. As a demonstration, forecasting the aftermaths of the COVID-19 shock on the stock market is among the most popular research topics in this theme. As an example of studies in this theme, Lazzini et al. (2021) use social media data and show that emotions expressed in social media can significantly predict stock market volatility. Further, Amankwah-Amoah et al. (2021) show how the pandemic has driven the digitalization of the economy around the globe and future opportunities for economic growth. They also highlight that racing toward digitalization may raise concerns such as the low productivity of laborers due to work-life imbalance.

4.1.2.2. Labor market. Studies found here focused on how individuals such as the self-employed were affected by new regulations imposed by governments during the pandemic (e.g., Kalenkoski & Pabilonia, 2021; Lastauskas, 2021). Unemployment, Social Isolation, and Lockdown are the keywords in this theme. Researchers have examined the impact of the pandemic shock on the labor market and how social isolation and lockdown have changed labor markets for self-employed individuals. Together, studies in this theme conclude that the unemployment rate due to the pandemic is significantly higher among unincorporated self-employed individuals.

4.1.2.3. Public policy. This theme is in 2021 (e.g., Sharma, Borah, & Moses, 2021; Buchetti, Parbonetti, & Pugliese, 2021). Using more data resources available for empirical analyses, researchers in 2021 scrutinized factors that have been driving countries’ responses to COVID-19. Governance structure, healthcare infrastructure, and learning experience from previous pandemics are identified as examples of countries’ COVID-19 policy drivers (Sharma et al., 2021). In addition, researchers in this theme used keywords such as Healthcare System, Global Crisis, Social Norms, and Stakeholder to emphasize the vulnerability of global healthcare systems and healthcare infrastructures to tackle global pandemics.

4.1.2.4. Education system. An abrupt shift from traditional classrooms to online synchronous or asynchronous methods of delivering materials to the audience raises questions about threats and opportunities of e-learning for both educators and educational institutions (e.g., Alam & Asimifar, 2021; Klarin, Inkizhinov, Nazarov, & Gorenskaia, 2021). Thus, research on the Education System theme scrutinizes the degree to which higher education institutes benefit from the new delivery methods while facing disrupting challenges such as low student engagement and constraints resulting from losing traditional financial resources (e.g., Alam & Parvin, 2021; Liu et al., in press).

4.1.2.5. Sustainable development. The main focus of research categorized in the Sustainable Development theme is to increase awareness about the negative impacts of unsustainable economic development and business competition, especially during crisis times such as the COVID-19 pandemic (e.g., Markovic et al., 2021; Soundararajan, Sahastrananam, Khan, & Jain, 2021). This theme contains articles from various business and economic disciplines and uses keywords such as Sustainability, Responsibilities, Intersectionality, Global Supply Chain, and Emerging Markets in their research. For instance, Markovic et al. (2021) provides a framework for business cooperation for small and medium-sized companies in times of crisis in emerging markets to improve financial outcomes.

4.2. Organization level

4.2.1. Research themes 2020

Our results revealed six research themes at the organization level in 2020. These themes are Corporate Strategies and Responses, Travel and Tourism, Gender Studies in Organizations, Crisis Leadership, Risk Management, as well as Supply Chain and Innovation. The following section summarizes these themes.

4.2.1.1. Corporate strategies and responses. The essence of research in this theme is to examine how company leadership has adapted to cope with unprecedented shocks from the COVID-19 pandemic. Corporate Social Responsibility, Marketing, Innovation are keywords in this theme. As a demonstration of research in this theme, He and Harris (2020) focus on corporate strategies during the COVID-19 time and propose that the pandemic provides a unique opportunity for companies to embrace more authentic corporate social responsibility activities. They note that shifting marketing efforts to encourage their brand enthusiasts to be ethical consumers can build a meaningful bond between the brand and customers.

4.2.1.2. Travel and tourism. The broad and significant impact of the pandemic has been quite obvious in this theme. The recognized keywords were Hospitality, Tourism, Sustainability, and Recovery.

4.2.1.3. Business and economic disciplines. This theme is categorized as a business and economic discipline and uses keywords such as Sustainable Development, Global Supply Chain, and Innovation.
Research in this theme has used crisis leadership and risk management models in the context of hospitality and tourism management to identify interim and long-term solutions to mitigate uncertainties about traveling during pandemics (e.g., Sigala, 2020; Lai & Wong, 2020). For instance, Sigala (2020) proposes that the tourism industry should consider all the stakeholders, namely tourists, supply chains, destination management organizations, and policymakers when outlining potential solutions to managing the effects of the next global pandemic in this industry.

4.2.1.3. Gender studies. Researchers of Gender Studies theme at organization level examine how COVID-19 has contributed to widening gender gaps in organizations. In addition, research on this theme aims to show how genders were disproportionately affected by the pandemic. Examples of such negative impacts are increasing the risk of losing jobs, receiving lower salaries, and not being promoted to higher organizational positions due to working from home (e.g., Henneman & Shymko, 2020; Branicki, 2020). Feminism, Vulnerability, and Sensemaking are keywords in Gender Studies in organizations in 2020.

4.2.1.4. Crisis leadership and risk management. The Crisis Leadership and Risk Management theme includes studies that have investigated the role of organizational leadership during unprecedented times such as the COVID-19 pandemic (e.g., Hartmann & Lussier, 2020; Hao, Xiao, & Chon, 2020). Crisis Management, Exploration, and Exploitation are keywords in this theme in 2020. Hartmann and Lussier (2020) scholarly work is an example of research in this theme. This study highlights the importance of adopting changes among business-to-business salespeople by offering a socio-technical model of salesforce change. In their conceptual model, interactions of humans, tasks, technology, and the workplace structure play a key role in encouraging salesforce to embrace changes.

4.2.1.5. Risk management. Managing unexpected risks during disruptive times such as pandemics is the topic of studies in the Risk Management theme (e.g., Hughes, Morgan, Hodgkinson, Kourpalatis, & Lindgreen, 2020; Oehmen, Locatelli, Wied, & Willumsen, 2020; Rapaccini, Saccani, Kowalkowski, Paiola, & Adrodegari, 2020). Risk Management, Resilience, Natural Disaster are examples of keywords in this theme. Oehmen and colleagues note that due to significant risks on companies and their resources during the pandemic, managers require to leverage risk assessment and risk management tools to manage uncertainties (Oehmen et al., 2020). Rapaccini et al. (2020) use survey data collected from Italian manufacturing firms and offer a crisis management model with four stages of calamity, quick & dirty, restart, and adapt. Research in this theme urges companies to use risk management models to minimize the negative effects of unseen risks to business resources.

4.2.1.6. Supply chain and innovation. Supply Chain Innovation theme relates to the impact of COVID-19 on organizations’ supply networks. Due to the lockdown policies around the world, suppliers deal with the shortage of raw materials and human resources to maintain their production level. Researchers in this area have extended the literature by studying the effects of shocks in supply chains, resiliency in supply chains, and innovative approaches to overcome disruptions in global supply chains (e.g., Ivanov & Dolgui, 2020; Sharma, Adhikary, & Borah, 2020). Studies in this theme propose new supply chain designs and optimization solutions to make the supply chains more resilient against significant disruptions from either the supply or demand side.

4.2.2. Research themes 2021

We identify six themes at the organization level published in 2021: Corporate Strategies and Responses, Travel and Tourism, Gender Studies in Organizations, Technology, and Supply Chain Management, and Supply Chain Innovation. Except for the Technology theme, these themes also appeared in 2020 at the organization level, showing the continued importance of such research topics for organizations and leaders. Notably, the results indicate that the literature on supply chain management has been extended in a way that Supply Chain Management and Supply Chain Innovation have become two separate research streams. We elaborate on the themes in the following sections.

4.2.2.1. Corporate strategies and responses. The first theme, Corporate Strategies, and Responses, demonstrates that researchers have shown persistent interest in studying firms’ strategies during the pandemic (e.g., Tong, Xie, & Xiao, 2021; Uddin et al., 2021). Corporate Social Responsibility, Strategy, Corporate Governance, and Financial Crisis are the keywords in this theme. Notably, the results indicate that a considerable number of scholarly works highlight the importance of a firm’s social responsibilities during the pandemic, particularly in food and service industries (e.g., Ou, Wong, & Huang, 2021).

4.2.2.2. Travel and tourism. Scholars in the travel and tourism management discipline continue to picture the future of this industry, as lockdown policies and travel restrictions have undergone several changes since the start of the pandemic. Keywords in this theme are Hospitality, Recovery, Hotel Pricing, and Strategies. Research in Travel and Tourism theme concludes that future development of the tourism industry relies on increasing the diversity of supply and developing the capability to learn from consumers’ feedback at a faster pace while adopting innovations in business models (e.g., Breier et al., 2021; Kau-kshal & Srivastava, 2021).

4.2.2.3. Gender studies. Gender Studies in Organizations in 2021 is another common research theme among the 2020 and 2021 themes. During both years, scholars highlighted the asymmetrical impacts of the COVID-19 pandemic on women and traditionally underrepresented groups in organizations. However, academic works in 2021 put more emphasis on gender inequality and roles within firms, insinuating that gender inequality in the workplace has widened in the past two years (e.g., Venkataraman & Venkataraman, 2021; Bowes, Lomax, & Piasecki, 2021; Raiber & Verbakel, 2021). Keywords that appeared in this theme are Gender Inequality, Childcare, and Gender Roles.

4.2.2.4. Technology. The Technology theme in 2021 is a new theme compared to 2020 research areas. Keywords in this theme are Artificial Intelligence, Robots, Sustainable Development, Automation, and Competitiveness. Studies in this theme include articles that explain how new technologies disrupt industries and business models and how businesses should leverage their business models to increase their performance (e.g., Shankar et al., 2021; Brem, Viardot, & Nylund, 2021; MacLeavy, 2021). As an example of research in this theme, Shankar et al. (2021) note that the retail industry is among the pioneers to adopt a new range of technologies as customers can benefit from virtual and augmented reality during their shopping process.

4.2.2.5. Supply chain management. A majority of articles at the organization level in 2021 studied the impacts of COVID-19 on organizations’ supply networks. The main argument is that supply chains throughout the world were dramatically disrupted due to the global lockdown policy in various countries. Due to the lockdowns, suppliers deal with the shortage of raw materials and human resources to maintain their production level. Researchers in this area have extended the literature by studying unpredicted shocks, risk management, sustainability, and resiliency in supply chains (e.g., Kumar & Sharma, 2021; Chopra, Sodhi, & Luckert, 2021; Li, Chen, Collignon, & Ivanov, 2021). The case is exemplified by Li et al. (2021) study about the ripple effects of local disruption in supply. They simulate circumstances that shocks such as pandemics and other natural disasters can propagate forward and
downward of the supply chain, affecting both demand and supply sides in the chain.

4.2.2.6. Supply chain innovation. The Supply Chain Innovation theme appeared as a part of the supply chain management theme in 2020. However, our results indicate that scholars have paid special attention to the role of innovation in supply chains. As a result of such scholarly activities, Table 3 shows that supply chain innovation emerged as a new theme in 2021. Supply Chain Resilience, Entrepreneurship, Dynamic Capability, and Food Supply Chain are among the keywords in this theme. Researchers of this theme propose new supply chain designs and optimization solutions to make the supply chains more resilient against significant disruptions from either the supply or demand side (e.g., Blackmon et al., 2021; Ruel & El Baz, in press).

4.3. Individual level

4.3.1. Research themes 2020

The findings summarized in Table 3 show that few studies have scrutinized the impacts of the pandemic at the individual level in 2020. The only research theme at this level in 2020, Psychological Well-Being, examined the effects of the pandemic on individuals in general and employees in specific (e.g., Carnevale & Hatak, 2020; Yang & Wong, 2020). Studies conclude that stress and anxiety, risk of sickness, and uncertainty of losing jobs, all caused by the pandemic, negatively affect individuals’ psychological wellbeing. Further, the shock caused by the pandemic makes many employees reflect on their experiences of person-environment and person-organization fit (Carnevale & Hatak, 2020), which may affect their future career choices.

4.3.2. Research themes 2021

There was a significant growth of Individual-level studies in 2021 examining the effect of the pandemic on employees and consumers. Three themes emerged at the individual level: Psychological Well-Being, Emotional Responses, and Consumer Behaviors. Among them, the Psychological Well-Being theme remains from 2020, indicating the importance of the topic. The following sections summarize the findings in each of the 2021 themes at the individual level.

4.3.2.1. Psychological well-being. Studying the research themes at the individual level reveals that the theme of Psychological Well-Being remains one of the scholars’ popular topics in 2021. The main keywords in this theme are Well-Being, Burnout, Justice, Stress, and Telework. However, the results show that the focus of studies in this theme has shifted from individuals’ productivity to burnout, stress, and telework (e.g., Yu, Lee, Popa, & Madera, 2021; Ninaus, Diehl, & Terlutter, 2021; Torr`es et al., 2021). The pandemic has forced many employees to work from home and communicate with colleagues through emails or video calls. Despite being flexible and convenient for some, this stream of research focuses on the challenges of working from home, such as extra hours, lack of engagement, and job burnout (Torr`es et al., 2021).

4.3.2.2. Emotional responses. The Emotional Responses theme contains research that scrutinizes how COVID-19 affects consumer evaluation of...
risk and trust. Risk Perception, Perceived Threat, Trust, and Collaboration are the keywords in this theme. For instance, Yost and Cheng (2021) argue that transparency in the relationship between consumers and business owners plays a critical role when individuals dine in a restaurant. In another study on this theme, researchers have shown that cognitive trust increases individuals’ willingness to use personal information (e.g., contact tracing) to help authorities control the spread of the virus (Chen et al., 2021).

4.3.2.3. Consumer behaviors. Research on the theme of Consumer Behaviors highlights consumers’ reactions to the pandemic and its aftermaths (e.g., Jiang and Stylos, 2021; Li et al., 2021). Li et al. (2021) concluding that a closer (or farther) distance to highly affected COVID-19 epicenters results in less (or more) irrational consumption behaviors. They call this phenomenon the “distance proximity effect” and argue that consumers’ tendency towards risk aversion moderates this effect. In another example of research in this category, Ozuem, Ranfagni, Willis, Rovai, and Howell (2021) seek to study factors that influence consumers’ reaction to service failure and recovery during the pandemic. They categorize consumers into three groups: empathizers (consumers maintain a positive relationship with brands), blanders (consumers with at least normal expectations of service recovery after failure), and churners (consumers with limited emotional attachment to brands). Then, they suggest that firms’ marketing policies during their service failure time may result in different outcomes depending on customers’ type. Together, research in this theme used keywords such as Consumer Behavior, Accountability, Digital Transformation, and Retailing in their research.

5. Future research direction

The third goal of the current study concerns the way forward and opportunities for future research direction. To identify the future research themes, we followed Lim et al. (2021) and conducted content analysis on the future research direction and implication section of papers. In the Research Theme section, we categorized the main themes into three levels: Individual, Organization, and Societal levels, combining all papers in each theme and manually extracting the future research directions and implication at each level. Then, we performed content analysis using Leximancer Software (Leximancer, 2022) a reliable tool for content analysis used by multiple bibliometric studies (e.g., Meek, Wilk, & Lambert, 2021; Tiwary, Kumar, Sarraf, Kumar, & Rana, 2021). The software automatically analyzes textual data using Bayesian learning algorithms and provides concepts and high-level themes with interactive visualization and text output. The software also provides backtracking and access to excerpts of the text from which the concepts and themes are derived.

The analysis starts with cleaning the data by removing the stop words (i.e., unwanted words that do not add value to textual analysis, such as the, and, or, a, to name a few), merging similar concepts (e.g., COVID-19 and corona virus) and removing the unnecessary words (e.g., limitation, future, study). Then the software generates concept seeds using the proximity value of the words and forms a thesaurus through...
supervised or unsupervised machine learning methods. Finally, the thesaurus is used to build the network of concepts and themes (Meek et al., 2021).

We studied the visual output, the concept maps, and excerpts of the text from which each concept and higher-level themes are derived. Fig. 3 presents the concept maps at the Individual, Organization, and Societal levels. Next, research questions were formulated at each level of analysis and each research theme based on the concepts and excerpts of the text. The research gaps and questions are summarized in Table 4.

5.1. Societal level future research

Future research directions at the Societal Level included four themes: Inequality, Social Media, Public Policy, and Global Supply Chain. Concerning the Inequality theme, there is a continuing concern over that the pandemic exacerbated and exposed growing societal gaps including income, age, gender and racial inequality. Researchers have argued that the pandemic has disproportionately affected women (e.g., Peck, 2021) and people of color (e.g., Crockett & Grier, 2021) and have called for further research to understand the sources of such inequalities and ways to alleviate them. The second theme for future research is Social Media. Social media played an essential role in communicating accurate and inaccurate information, as face-to-face interactions reduced during the pandemic. It is suggested that the nature of cooperation between government and social media should be studied to avoid the spread of misinformation (e.g., Bae, Sung, & Kwon, 2021). In the Public Policy theme, it is suggested that scholarly work should be focused on effective risk communication as well as investigating the ways that governments should communicate and impose restrictive policies such as mask mandates and lockdowns (e.g., Liu & Mehta, 2021).

Global Supply Chain is the fourth theme for future research directions. The supply chains of various products have been impacted differently during the pandemic. The disruption in the supply chain of products has not been seen consistently across all industries. Some products and services, such as apparel and hospitality services, witnessed diminishing demand while others, such as medical supplies including devices, protective clothing, face masks, disinfectants, faced excessive demand and shortages (Paul et al., 2021). Thus, scholars suggested that researchers should investigate the challenges of each industry, identify the risk of each group of products in different crisis scenarios, and examine the policies needed to oversee the supply chain risks (e.g., Esper, 2021).

5.2. Organizational level future research

At the Organization Level, we identified five themes for future research: Supply Chain, Firm Responses, Technologies, Hospitality, and Retailers. The Supply Chain theme focuses on ways that companies can mitigate the negative impacts on supply chain disruptions caused by the pandemic. Researchers have suggested that areas such as consumer tolerance of disruption (e.g., Dubey, Bryde, Blome, Roubaud, &
Table 4
Future Research Direction.

### Societal Level

- Inequality (e.g., Crockett & Grier, 2021; Peck, 2021)
  - What have caused racial and gender inequalities during the pandemic? And how can such phenomena be mitigated?
  - We have witnessed an increase in the divide among people during the pandemic. What are the roots of this issue? What measures should be taken to combat this problem?

### Social Media (e.g., Bae et al., 2021)

- How should government agencies work with Social Media platforms to avoid the spread of misinformation?
- How can social media help keep consumption unainted in times of crisis?
- How should officials communicate the risk during a pandemic?
- How should restriction policies such as lockdown and travel restriction be communicated and imposed to minimize the economic impact?
- How can social media help keep consumption unainted in times of crisis?

### Public policy (e.g., Liu & Mehta, 2021)

- How should officials communicate the risk during a pandemic?
- How should restriction policies such as lockdown and travel restriction be communicated and imposed to minimize the economic impact?

### Global Supply Chain (e.g., Paul et al., 2021; Esper, 2021)

- Since supply chain issues are not similar across various industries, what are the different challenges of each sector? What strategies should be implemented in the recovery phase?
- How to quantify consumer welfare risks of global supply chains? Which product categories are more prone to supply chain disruption at times of crisis?
- What policies are necessary to oversee the supply chain risk of different product categories?

### Organizational Level

- Supply chain (e.g., Burgos & Ivanov, 2021; Dubey et al., 2021; Nagurney, 2021)
  - To what extent do consumers accept price spikes and supply shortages passing along a supply chain to the demand side because of unprecedented events?
  - What are the best strategies to localize supply chains to minimize risks and shocks deriving from global pandemics?
  - What policies should companies implement to improve control over the ripple effect in a disruption in supply chains?

#### Firm response (e.g., Krammer, 2021; Benton et al., 2021)

- What are the factors that help organizations to be resilient and to adapt in times of crisis effectively? How do those factors impact the adaptation?
- What is the relationship between pandemic risk disclosure and firm performance? How should pandemic risk be communicated to investors?
- How has firms’ work-from-home policy impacted employee attitudes and behaviors and firm performance?
- To what extent do work-from-home policies magnify employees’ job burnout, family-work-construct, and work-family-construct stresses?
- As work from the home policy may reduce employees’ interactions with peers, how can firms help employees develop their professional networks?
- What are the optimum strategies for new ventures to develop sustainable growth during uncertain times?
- How can technologies be used to handle a crisis, communicate with customers, and maintain a relationship with customers during a crisis?
- When companies implement a work-from-home policy, how can technologies motivate and reward employees?
- What is the role of digital supply chain technologies in supply chain resilience?
- Should companies perform patent pledges for COVID-19 related inventions? What are the pros and cons from the patent holder firm’s perspective?
- How do do in-store technologies (e.g., robots and smart mirrors) impact customers shopping behaviors and engagement?
- Hospitality (e.g., Japutra & Stumorong, 2021)
  - What is the impact of offering a hotel as a place for quarantine? What are the pros and cons, and how does that impact a hotel’s performance?
  - What type of hotels will recover faster in the post-pandemic era?
- Retailers (e.g., Grewal et al., 2021)
  - How does ordering mode (online vs. in-person) influence purchase behaviors (e.g., purchase amount, purchase frequency, and customer loyalty)?
  - How does the lack of social interaction influence brand preferences and shopping behaviors?
  - How can retailers increase customer engagement when associates should exercise social distancing?

#### Individual Level

- Consumer (e.g., Chen et al., 2021; Park et al., 2021)
  - What factors enhance cooperative behaviors among consumers in times of crisis?
  - How do consumers evaluate marketing messages during a crisis such as a pandemic?
- Employees (e.g., Couch, O’Sullivan, & Malatzy, 2021; Nissa et al., 2021)
  - What causes or influences employee turnover decisions during a pandemic?
  - How do shocks shape employee attitudes, intentions, and behaviors in times of crisis?
  - How do work-from-home and hybrid workplace policies affect employees’ performance, job satisfaction, and organizational commitment?
  - What are the key characteristics of leaders that enable them to lead their organizations during an unexpected crisis?
- Services (e.g., Lee et al., 2021; Secundo, Shams, & Nucci, 2021)
  - What factors impact technology adoption among consumers in a healthcare ecosystem and other services in times of crisis?
- Entrepreneurship (e.g., Secundo et al., 2021; Huang & Chen, 2021)
  - How can an entrepreneurial mindset be taught in a distant learning environment?
- What are entrepreneurs’ stressors and coping strategies in different industries and cultures?
- Risk (e.g., Byrd et al., 2021; Sung & King, 2021)
  - What are the sources of risk perception among consumers and employees in different industries?
  - How does exposure to media shapes attitude, risk perception, and fear among consumers in different industries and cultures?
Giannakis, 2021), company policy development for controlling the ripple effect (e.g., Burgos & Ivanov, 2021), and ways and consequences of localizing supply chains require further investigation (Nagurney, in press). The Firm Responses theme focuses on policies implemented to address the issues caused by the pandemic. These policies include developing resilience within the firm (e.g., Kramer, 2021), modes of risk disclosure (Benton, Cobb, & Werner, in press), and work-from-home policies (Khan, 2021).

Third, the Technology theme focuses on firms’ upgraded use of technology during the pandemic. The pandemic has accelerated the digitization of tasks and processes, leading to a dramatic change in the work environment. Use of these technologies in customer relationship management (e.g., Grewal, Gauri, Roggeveen, & Sethuraman, 2021), human resources management (e.g., Grewal et al., 2021), and supply chain management (e.g., Balakrishnan & Ramanathan, 2021) has implications for businesses and researchers have called for inquiry in this area. The themes of Hospitality and Retailers emphasize the areas of investigation in two industries that are highly impacted by the pandemic. In the Hospitality theme, researchers have called for an examination of hotels in the recovery period and the impact of quarantine on hotel performance (e.g., Japutra & Situmorang, 2021). The future research directions for the theme Retailers include the impact of technology and pandemic-related policies on customer shopping intentions and behaviors (Grewal et al., 2021).

5.3. Individual level future research

Six themes were detected at the Individual Level: Consumer, Employee, Services, External Validity, Services, and Risk. Two research topics are emphasized in the Consumer theme. First, exercising pandemic-related policies such as mask mandates and social distancing requires consumer cooperative behavior. Researchers are encouraged to study the antecedents to such behaviors (e.g., Chen et al., 2021). Second, since consumers may evaluate marketing messages differently at different stages of a crisis, it is suggested that researchers focus on the evaluation of the marketing messages in times of crisis (e.g., Park et al., 2022). The Employee themes covers research related to effects of COVID-19 on employees and work-life balance extensively. Work-from-home (e.g., Zhang, Gerlowski, & Acs, 2021), self-employment (e.g., Kalenkoski & Pabilonia, 2021), turnover during and after pandemic (Bajrami et al., 2021), and effective leader characteristics in crisis (e.g., Klebe, Felfe, & Klug, in press) are future research streams in the Employee theme.

The pandemic heavily impacted service industries such as tourism and healthcare. According to the Services theme, researchers have called for research on the customers’ perception, evaluations, and behaviors in a service setting during a pandemic (e.g., Lee, Guo, & Chen, in press). Entrepreneurs and an entrepreneurial mindset play an essential role in communities during a crisis (Secundo et al., 2021). Researchers should focus on stressors and coping mechanisms of entrepreneurs at such periods as a possible future stream of research (e.g., Huang & Chen, 2021). Finally, based on the Risk theme, risk perception and the resulting emotions and behaviors are areas that researchers are urged to study to learn from for future crises (e.g., Sung & King, 2021). It is important to note that the theme External Validity refers to the future research directions section of those empirical studies that have called for testing the relationships in other contexts such as other countries, industries, and different periods to increase the findings’ external validity.

6. Conclusion

This study focuses on four gaps in the existing literature related to the global COVID-19 pandemic and provides a bibliometric review of almost 8,000 carefully selected research articles in the business management field. The analysis focused on the performance of research constituents, thematic analysis of the literature, categorization of the themes at a societal, organizational, and individual level, and finally, a deep analysis of future research calls in the body of literature.

The present study is subject to certain limitations. First, we collected COVID-19 studies from the Web of Science and Scopus databases. There is a possibility of studies not being listed in either of these databases. Although this is common in many bibliometric studies as they use in only one of the two databases in their search procedure. To limit the missing studies, we merge information from both databases to collect a comprehensive list of all COVID-19 relevant research. Furthermore, research on COVID-19 in business disciplines has been growing at an incredible rate, which increases the likelihood of missing data. Next, this study only focuses on COVID-19 research published in journals focusing on business disciplines. Other literature may offer studies related to cooperation policies and business practices during the pandemic. Therefore, future research may include other studies into their bibliometric research to find cross-disciplinary research gaps.

CRediT authorship contribution statement

Hossein Hashemi: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.
Reza Rajabi: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.
Thomas G. Brashear-Alejandro: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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