INVESTIGATING THE COVID-19 OUTBREAK AND TOURISM SECTOR FOR FUTURE RESEARCH AGENDA: A BIBLIOMETRIC ANALYSIS APPROACH

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Abstract: The study aims to explore and review the scientific documents published in the pandemic covid-19 and tourism sector. The bibliometric analysis was used to collect and analyze scientific documents in the Web of Science database. The analysis used the R program to get information and map the main idea related to contributors in different objects, including the authors, institution, country and publication source, thematic mapping of the paper in covid-19 and tourism sector. The finding discovers 791 scientific documents and 320 sources. The finding emphasizes that the research topic in pandemic covid-19 and tourism sector is generally given information and benefit.

Key words: covid-19, tourism sector, co-word analysis, mapping, bibliometric analysis

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INTRODUCTION

The pandemic covid-19 has been spread worldwide and has impacted all sectors since December 2019. The pandemic covid-19 has significantly impacted tourism sectors (Pahrudin et al., 2021a). The pandemic greatly impacted several sectors such as tourism, health, economic, social and education, and environment sectors (Pahrudin et al., 2021a). In addition, the pandemic covid-19 has given a loss of income around US\$ 1.2 trillion and decreased the number of international arrivals in the world by around 78%. Moreover, the tourism sector's contribution is the leading sector to create the gross domestic product (GDP) in some countries worldwide. Therefore, despite health issues being the key in covid-19, the tourism sector is concerned by the authors with major questions for current issues and the future.

To understand the condition and vulnerability during the pandemic covid-19 and search for the solution, there is urgent to know the studies to analyze the comprehensive understanding to face the covid-19 pandemic. The World Health Organization (WHO) highlights that the global roadmap has also been outlined as the objective. However, this study focused on the tourism sector that has been impacted by the pandemic covid-19 with mapping of the scientific document published in the Web of Science (WOS) database. The bibliometric analysis is one of the dominances used in most medical and clinical fields, including pandemic and epidemic (including pandemic covid-19), supporting a systematic literature review (Mahi et al., 2021). From the methodological of study, the bibliometric analysis was found in several studies in medical study. The bibliometric analysis was expanded in several studies conducted by several authors, such as in medical studies by public health studies and generally in the infectious disease and virology study. The trend of research related to coronavirus, such as in SARS, MERS has been increased the number of articles. However, to cover the knowledge in bibliometric analysis, no previous studies have been yet used bibliometric analysis to cover the field in tourism literature and covid-19 using the WOS (Web of Science) database. Hence, this study tries to analyze and expand the literature in tourism and pandemic covid 19 for future research agenda. This study aims to identify the research and provide information on the tourism sector and the pandemic covid-19. Secondly, to find the tourism literature in the context of the covid-19 issue with future research. The bibliometric analysis was conducted on papers published in the Web of Science database. Thus, in this study, we can contribute to extending the literature related to tourism and the covid-19

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pandemic. Therefore, a broad scope can be applied in this area to explore future studies. In addition, this study tries to map the structure of information of the papers to provide an understanding for researchers, academicians, and policymakers in the pandemic and tourism field. To reach the aims in this research, we arrange the specific research questions are provided below:

1. Who are the most contributing authors, publication sources, institutions, and countries are discussing the tourism and pandemic covid-19?
2. What are the most frequently used by authors based on the tree-map analysis?
3. How will research in the tourism area and covid-19 outbreak evolve in the future?

In this study, bibliometric was used to analyze and provide the complete result in pandemic covid-19 literature and connected with the tourism field since 2020-2022. For theoretical implications in tourism, we provide the scientific result and map the area of research in this study such as bibliometric analysis, finding the authors, journals and thematic or issue of the publication based on the publication in the period early of covid-19 in 2020-2020 using Web of Science (WOS) database. We attempt to provide the scientific result in a specific field and increasing trend in publications since covid-19 and tourism sectors. In addition, we try to visualize the finding more appropriately, such as the publishing sources, map of collaboration around the authors, and interconnection between the country, institution, and publisher. The finding in this research helps us understand the research concentration at different areas or topics in the tourism sector. From the perspective of the stakeholders or managers, the study gives the understanding and knowledge of the emergence of the pandemic covid-19 for the tourism industry, such as in tourism destinations and the hospitality industry. It is urgent to solve the situation of covid-19 in the tourism industry, such as applying the concept of CHSE (Clean, Health, Sustainability and Environment) during the pandemic covid-19. Therefore, the stakeholders such as the government, travel managers, and policymakers need to understand the pandemic covid-19 impact on the tourism industry. Thus, the study encourages the stakeholders or marketers in the tourism industry to consider the pandemic covid-19 as danger situation. This paper sets several sections: section 2 explores the data and methodology section, which deeply explores the indicators and discus the bibliometric studies to assess the scientific result. The output or the results of the study is discussed in section 3. The last section, or section 4, is the conclusion to summarize the findings and outline the research gap and direction for future research.

METHODOLOGY AND DATA ANALYSIS

This study employs bibliometric analysis to solve the research issue and scientific mapping approach. This method analysis is one of the methods in mathematical and statistical with purposing to analyze knowledge quantitatively (Shahzad et al., 2021). The main idea of bibliometric analysis is to analyze the object based on the number of an object such as kinds of publication, the authors, various documents, the linking of the co-authors among the authors (Gao et al., 2021). Bibliometric analysis is one method in recording the publication, examining the number of documents used, and understanding publications' management. Recently, bibliometric methods have been used in conducting of analyzing the research (Farrukh et al., 2020) and institutes and countries around the world (Nawaz et al., 2020). Therefore, visualization in bibliometric analysis gives information more deeply and broadly to understand research trends by highlighting the knowledge structure (Cobo et al., 2013). In this research, We perform five steps in bibliometric analysis adopted from (Zupic and Čater, 2014). The flow chat of bibliometric analysis is described in Figure 1. Furthermore, we use Lotka's Law in this study to assess the frequency or number of publications by authors, which determines the pattern of productivity in a particular field of study over a given period, allowing conclusions to be drawn as to whether the area under study is one where most of the production is concentrated in a small number of authors or not (López-Fernández et al., 2016). In addition, in this study, we considered through Bradford's Law for journal increasingly with the highest number of publications are ranked as 'core zone' so on. Bradford's Law is determined how the literature is distributed in the journal and as a direction to decide the publication's number based on the core and subject of the publication (Garg and Tripathi, 2018).

Figure 1. Workflow Chart of the Analysis
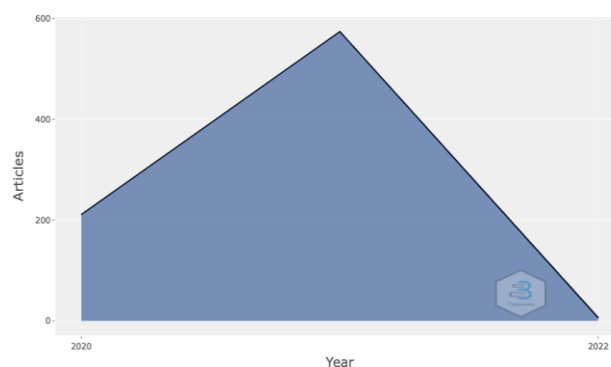(Source: Adopted from Zupic and Čater, 2014)

Figure 2. Annual Publication Trend
(Source: analyzed by author)

Therefore, in this study, we used the keyword and co-word analysis to find the research's structure overall to give information and knowledge structure of the paper. This method is the systematic method in science to cover the field linkages search the phenomena (Feng et al., 2017). Meanwhile, co-word analysis is the content and context of paper to link co-occurrence connection among the paper structure (Feng et al., 2017). Furthermore, to know the structure and thematic

map, we used Multiple corresponding analyses (MCA). MCA is a method to draw and describe the conceptual structure of the field research and K-means clustering to recognize the group of the document that explains the common concept of the research (Aria and Cuccurullo, 2017) and identify the research structure by measuring the keyword in the study (Demiroz and Haase, 2019). Web of Science (WOS) database was used in this study to answer the research questions related to getting information on bibliometric analysis. The Web of Science (WOS) is one of the most significant source databases for scientific databases covering more than 161 million records and coving more than 254 subject areas (Web of Science Group, 2021). Compared with other databases such as the Scopus database, the Web of Science (WOS) is not essentially the largest index journal in all different fields (Ellegaard and Wallin, 2015). We used the keyword search strings to get the bibliometric information from the WOS database to refer to the focus research. The topic can be searched through the keyword: ("Virus*"OR" Pandemic*" OR "Coronavirus" "Covid-19" OR "Tourism" OR "Hospitality" OR "Leisure") and found 791 results. The authors searched the documents or papers in December 2021. In the last, in this study examines and visualizes the map of the research focus, we used the 'Bibliometric' package (http://www.bibliometrix.org) to find the bibliometric analysis and was founded by (Aria and Cuccurullo, 2017) in R (statistical program). The bibliometrics analysis using R packages is the familiar software and covers the features in publications (Firdaus et al., 2019; Linnenluecke et al., 2019).

RESULTS AND DISCUSSION
Trend publication and Main information
The descriptive analysis explained the sample description of information related to the number of publications. After the software's cleaning and filtering process, table 1 explained the primary information about the publication data related to main bibliometric research in covid-19 and the tourism sector. In this study, we obtained 791 documents of publication to analyze. Moreover, the trend number of publications presents in Figure 2. The growth of publication regards to covid-19 and tourism sector significantly increased in 2021. This trend indicates a great increase in 2022. However, the publication's trend in 2022 significantly decreased compared to 2021. The trend of publication in early 2020 to 2021 indicated the concern of authors around the world toward covid-19 in the tourism sector and gained the interest in the scholarly over the world.

Table 1. Sample descriptions. Source: Web of Science (WOS) database

| Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2020:2022
Sources (Journals, Books, etc)	320
Documents	791
Average years from publication	0.259
Average citations per documents	8.284
Average citations per year per doc	5.904
References	34139
DOCUMENT TYPES	
article	717
article; data paper	4
article; proceedings paper	1
editorial material	21
letter	7
review	41
DOCUMENT CONTENTS	
Keywords Plus (ID)	1080
Author's Keywords (DE)	2569
AUTHORS	
Authors	2519
Author Appearances	2719
Authors of single-authored documents	130
Authors of multi-authored documents	2389
AUTHORS COLLABORATION	
Single-authored documents	130
Documents per Author	0.314
Authors per Document	3.18
Co-Authors per Documents	3.44
Collaboration Index	3.61
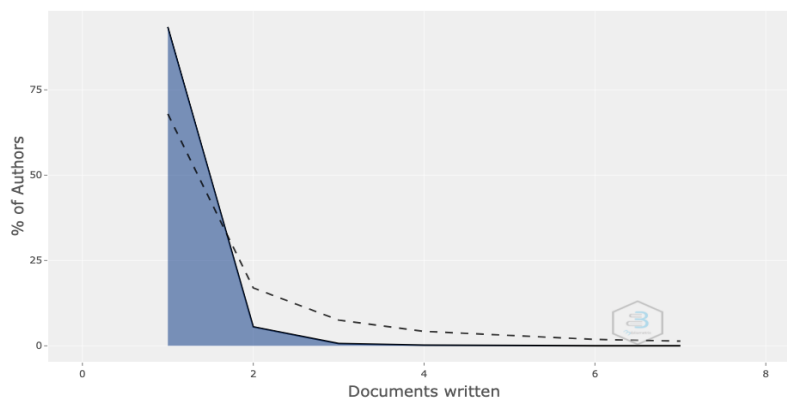
Figure 3. Distribution of Publication through Lotka's Law (Source: Analyzed by author)
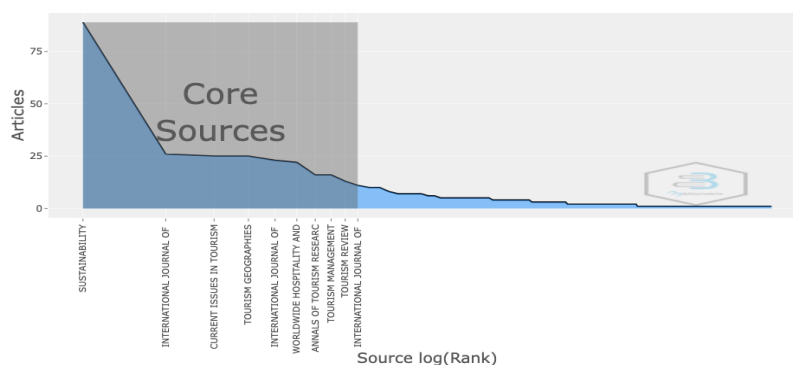

Figure 4. Bradford's Law of Sources Cluster (Source: analyzed by author)

Most Contributing Authors and Publication Sources
In this section explains the authors and source of publication in the field study of covid-19 and tourism. In figure 3, we offer the frequency distribution of scientific production using Lotka's Law scientific productivity. Lotka's Law explains that document production is focused on the limit of authors or not (López-Fernández et al., 2016). In this study, the result is various, with many authors (2.355 out of 2.519) having only one publication, which accounts for 93.5% of the total contributing authors. The distribution illustrates that contributions to scientific papers are not distributed to a few writers but are spread over many of them. Moreover, according to Bradford's Law, in terms of publication sources, just four journals have established themselves as the primary publishing sources in this field. As presented in figure 4 for Bradford's Law, several journals as the core of publishing, such as the journal sustainability, International journal of hospitality

management, current issue in tourism, tourism geographies, international journal of environmental research and public health, worldwide hospitality and tourism themes, annals of tourism research, tourism management, tourism review, and international journal of contemporary hospitality management are the primary journals that have a greater impact on publishing than other journals in the area. Based on Table 2, we present the most 20 contributing authors with the number of publications and journals related to covid-19 and tourism to know the contribution, productivity and their impact on the publication. With the number of authors published in several journals, we can conclude that Han H is the leading contributor in publication with the total number of publications seven article documents with article fractionalized 1.54, followed by Kim J has published six articles since covid-19 period until 2022. Therefore, in the third position, Al-Ansi A is the most contributing author with 4 article documents during the pandemic covid-19. Generally, the information about the most contributing authors and journal contributing in the field of study in the Web of Science database can be seen in table 2. Sustainability is the most contributing journal to publish the scientific documents with 89 article documents, followed by international journal hospitality management with 26 article documents. In addition, current issues in the tourism journal are the third most contributing journal with 25 article documents. The summary is presented in table 3 below. The sustainability journal is the journal that has increased significantly in covid-19 and the tourism sector. The sustainability journal is that most journals have significantly increased the number of citations and are the dominant journal over the years.

Table 2. Authors with the Most Contributions and Publication Sources (Source: Analyzed by author)

Rank	Most Contributing Authors			Rank	Most Contributing Publication Sources	Freq
	Authors	Freq	Articles Fractionalized		Sources	
1	Han H	7	1.54	1	Sustainability	89
2	Kim J	6	1.73	2	International Journal of Hospitality Management	26
3	Al-Ansi A	4	0.83	3	Current Issues in Tourism	25
4	Baum T	4	1.35	4	Tourism Geographies	25
5	Kim S	4	0.79	5	International Journal of Environmental Research and Public Health	23
6	Kumar V	4	1.75	6	Worldwide Hospitality and Tourism Themes	22
7	Shin H	4	1.20	7	Annals of Tourism Research	16
8	Barrientos-Baez A	3	0.70	8	Tourism Management	16
9	Cai GW	3	0.83	9	Tourism Review	13
10	Chua Bl	3	0.58	10	International Journal of Contemporary Hospitality Management	11
11	Dube K	3	1.67	11	Geo Uerj	10
12	Filimonau V	3	1.17	12	Tourism Management Perspectives	10
13	Gossling S	3	1.17	13	Tourism Recreation Research	8
14	Hall CM	3	0.92	14	Anais Brasileiros de Estudos Turisticos-Abet	7
15	Kang J	3	0.95	15	Journal of Destination Marketing & Management	7
16	Lai IKW	3	1.25	16	Journal of Hospitality and Tourism Management	7
17	Lee CK	3	0.78	17	Scientific Papers-Series Management Economic Engineering in Agriculture and Rural Development	7
18	Lee S	3	0.83	18	International Journal of Tourism Cities	6
19	Mostafanezhad M	3	1.58	19	Ocean & Coastal Management	6
20	Nicolau Jl	3	0.70	20	Almatourism-Journal of Tourism Culture and Territorial Development	5

The Distribution of Documents based on the Geographic and Institution

This part explains the mapping and distribution of published scientific documents. Table 3 explains the name of most countries and institutions in publishing scientific documents. In this study, the method Multi-Country Publications (MCP) and Multi-Country Publication Ratio (MCPR) were used to explain the collaboration around the countries for scientific publications. The institution of Hongkong Polytechnic University is leading for publication the scientific documents with the number of publications (NP=16), followed by the University of Johannesburg by 15 documents (NP=15). The third place for the most contributing publication is Griffith University, with 14 published papers. They were closely followed by Sejong university from South Korea country by13 document papers. The authors from University Sydney from Australia have contributed by 10 document papers. Several authors from some universities such as Bournemouth Univ, James Cook Univ, Univ Florida, Univ Queensland, Univ Surrey, and Zhejiang Univ have contributed nine paper publications. Among the authors from Auckland University of Technology, University Aveiro, University Cent Florida, Univ Complutense Madrid, Univ Macau, and Univ Oxford have contributed to publishing eight scientific articles. In addition, the authors affiliated from Univ Barcelona, Univ Canterbury and Univ Girona have published 7 document papers.

Therefore, China is the leading country in publishing the scientific document by 84 documents (NP=84), followed by the United States of America (NP=69) and in third place is Spain (NP=63). Moreover, South Korea is the most excellent collaborative document production compared to other top publishing countries, with an MCPR of 0.5556. The ratio indicated that the authors collaborate with the other countries. However, the other countries such as Australia, China, the USA, Japan, and Malaysia have MCPR values of 0.5366, 0.3929, 0.3913, 0.3846 and 0.3636. These countries have the trends in the research for collaborating with other countries in publishing the documents. Figure 5 indicates the network of article collaboration and production among the authors in the world. The blue color in the map means that the publications in those countries are under analysis, and the grey color means that there are no journals in those countries. The countries with the darkest indicate that most countries have published scientific documents. However, the red line represents the network of collaboration around the world. The countries with the most extensive line on the map indicate that the countries are the most active in collaborating with other countries. These countries are the United States of America, the

United Kingdom, and China. These countries have the most publishing and scientific collaborations with others authors. The result indicated that the most countries are dominated by developed countries in publishing scientific documents.

Table 3. The Most Contributing Countries and Institutions (Source: Developed by author)

Most Contributing Countries						Most Contributing Institutions		
Rank	Country	NP	SCP	MCP	MCP_Ratio	Rank	Affiliations	NP
1	China	84	51	33	0.3929	1	Hong Kong Polytech Univ	16
2	USA	69	42	27	0.3913	2	Univ Johannesburg	15
3	Spain	63	54	9	0.1429	3	Griffith Univ	14
4	United Kingdom	50	21	29	0.58	4	Sejong Univ	13
5	Australia	41	19	22	0.5366	5	Univ Sydney	10
6	India	40	35	5	0.125	6	Bournemouth Univ	9
7	South Korea	27	12	15	0.5556	7	James Cook Univ	9
8	Italy	25	22	3	0.12	8	Univ Florida	9
9	Brazil	24	20	4	0.1667	9	Univ Queensland	9
10	Poland	23	16	7	0.3043	10	Univ Surrey	9
11	Russia	18	17	1	0.0556	11	Zhejiang Univ	9
12	Turkey	18	16	2	0.1111	12	Auckland Univ Technol	8
13	Portugal	16	14	2	0.125	13	Univ Aveiro	8
14	Japan	13	8	5	0.3846	14	Univ Cent Florida	8
15	Croatia	11	8	3	0.2727	15	Univ Complutense Madrid	8
16	Malaysia	11	7	4	0.3636	16	Univ Macau	8
17	Greece	10	7	3	0.3	17	Univ Oxford	8
18	Indonesia	10	8	2	0.2	18	Univ Barcelona	7
19	Mexico	10	8	2	0.2	19	Univ Canterbury	7
20	Romania	10	8	2	0.2	20	Univ Girona	7

NP: Number of publications; SCP: Single country publications; MCP: Multiple country publications; MCPR: Multiple country publication Ratio
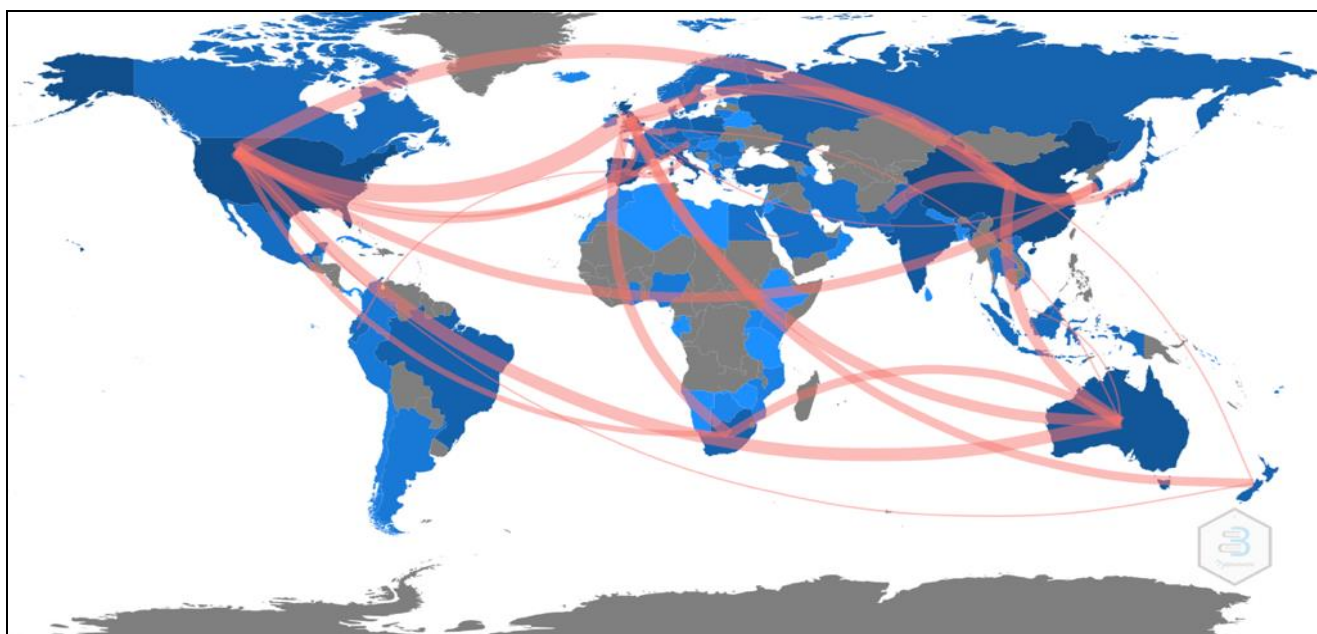

Figure 5. The Country Collaboration Map of the Authors (Source: Developed by author)

Thematic Map and Keywords

This part explains that the authors used to research keywords related to the pandemic covid-19 and tourism sector. The authors provide statistical analysis in the keyword to develop the scientific documents (Du et al., 2013). In addition, this part explains the different perspectives from research clusters or areas based on keyword co-occurrence and research dynamic. At the same time, we discuss the authors covering the research themes in the time of period of the study.

In the list figure 6, the word Tree-Map provides the 50 most frequently used keywords by the author in the scientific document publications refers to occurrences. Most words are used "tourism", "management", and "impact". The other keywords commonly used, such as "impacts", "model", "crisis", and "industry", are among the top 6 words in the study. The authors use these words to explain that these words strongly correlate to the focus of research in covid-19 and the tourism sector. In addition, the Multiple Correspondence Analysis (MCA) was applied to analyze the dimension of the conceptual structure map. The method emphasized the cluster main of the research interest. There are two-dimensional plots of the cluster of the research in this study. Figure 7 discusses the scientific output organized into two clusters that authors have considered on the related aspects. The content of clusters is the scope of the article, which illustrated the diversity, breadth, and intellectual in every cluster. Firstly, the red cluster conceives a total number of keywords associated with the article. The red cluster has 21 keywords that emphasize "covid-19 pandemic". The red cluster has different aspects

of covid-19 such as "hospitality" and "tourism". In addition, the study highlights the others aspect of representing the tourism aspect, such as "rural tourism" "tourism demand". The result of the red cluster indicates that the study of covid-19 refers to seeing how they impact the tourism sector such as recovery, sustainability, resilience, crisis management, innovation or related aspects are impacted during the covid-19 pandemic to the tourism industry.
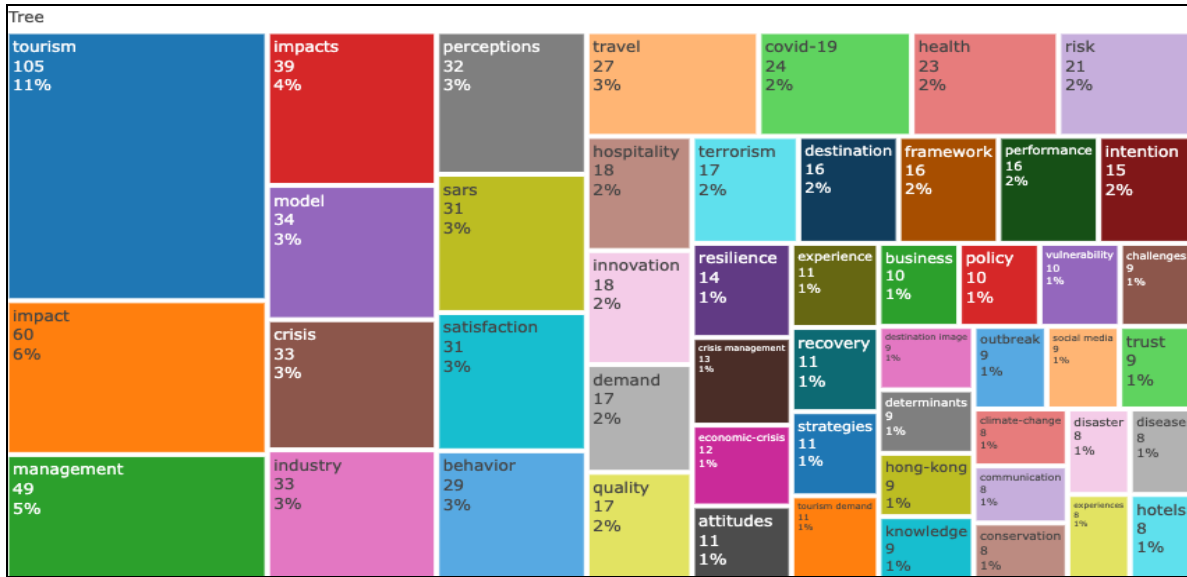

Figure 6. Words Tree Map of Author Keywords (Source: Observed by author)

Moreover, the second cluster is blue color. The blue color shows the vital word for an issue like "sentiment-analysis". The word of sentiment analysis explains the 'anxiety', 'well-being', 'nature-based tourism' and 'sustainable development. We generate that the research focuses on the sentiment analysis of the authors, focusing on how the tourism sector can develop in the pandemic covid-19 period related to nature-based tourism. The structure map is also the geographic word in this study, such as 'China' and 'Spain'. The authors highlight two countries to find these countries as vulnerable in this area for spreading the covid-19. We know that China was reported as the first time to appear of the covid-19 in the world. In addition, the county of Spain is the worst case of covid-19 in the early of covid-19 in the research period. The authors mention the geographic area between China and Spain and the risk of covid-19 can impact the tourism sector.

DISCUSSION

This paper is the bibliometric analysis to find the scientific publication on the theme of pandemic covid-19 and tourism sector from the early pandemic covid-19 period in 2020 until 2022. In this section, we provide the answer to the questions arranged previously in this study. The main findings are summarized in several discussions in this section. Regarding research question 1 (RQ1), based on the result of bibliometric analysis in this study, we find that the most contributing author in the pandemic covid-19 and tourism sector is Han H. They have published 7 document articles
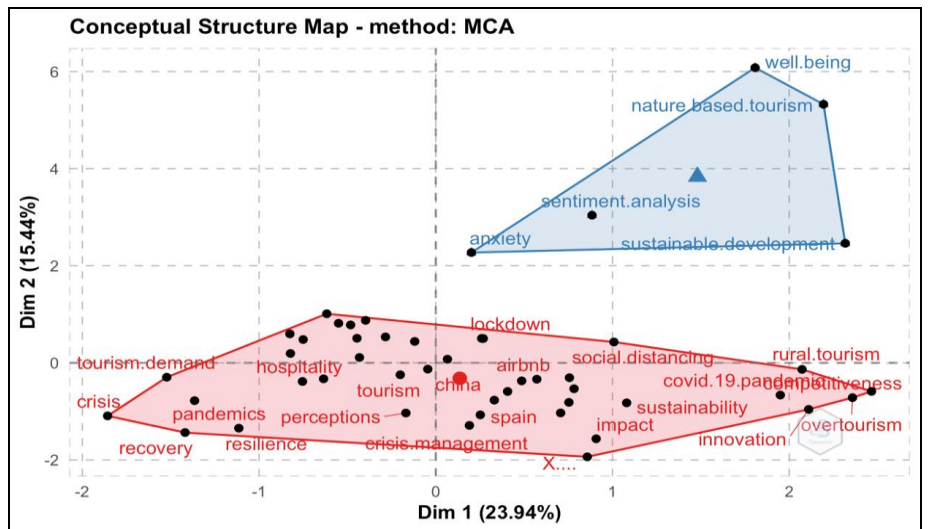

Figure 7. The Conceptual Research Structure (Source: Observed by author)

among 2519 authors. In the source of publication, the Sustainability journal is the leading journal by 89 document articles during the analysis period 2020-2022. Based on a study from several authors such as (Buckley, 2020; Higgins-Desbiolles, 2021), sustainability is one of the challenges in several industries post-pandemic covid-19 and having long-term and equitable development in local society. In addition, the time of covid-19 for the future of the tourism industry and hospitality provides the environment and social welfare or well-being (Everingham and Chassagne, 2020). This is in line with the author (He and Harris, 2020) revealed that the covid-19 give a chance for the company for the responsibility in corporate social responsibility and facing the international environment and social changes. Therefore, the most contributing country in the journal publication is China by 89 document articles (NP=89). In addition, the most institution in publishing scientific documents on the theme of covid-19 and tourism sector is Hongkong Polytechnic University.

To answer the second research question (RQ2), the keyword analysis explains the findings for the most keywords used by the authors in this research: tourism, impact, management, impacts, model, and crisis. The authors used the most keywords in this study based on pandemic covid-19 in the tourism industry. In addition, most keyword identifies that keyword explicitly explain the psychological aspects such as perceptions, satisfaction, behavior, attitude, and intention. The keywords in the psychology category explain the impact of the covid-19 in the tourism sector can impact tourist behavior and perception during the pandemic covid-19. The word's framework found in this study, such as tourism management, risk perception, tourist behavior, and satisfaction, will be important in the future post-pandemic covid-19. In this study, the selected of the word in the framework indicates that the building framework impacts covid-19 and tourism sector on the micro and macro environments such as in macro-environment such as economic aspects, lifestyle, a social and microenvironment in psychology behavior, satisfaction and intention aspects. These aspects can drive the change in tourism management (Mhlanga, 2018; Wang and Ap, 2013). The result of the study can bring the authors to find a new idea to conduct the research in tourism management in the future based on the central thematic. Some evidence said that tourists would consider visiting a destination based on the risk and crisis in the covid-19 pandemic period, and the risk influences the visit intention in the time of pandemic covid-19 (Qiu et al., 2020). At the same time, the author (Chen et al., 2020) said that the influence of traveler's perception was increased by the pandemic covid-19 and impacted the behavior in the tourism industry such as transport, visit time and tourist's destination. Similar to the author (Zheng et al., 2021) said that the travelling in the covid-19 pandemic period gave the tourists worry, enhancing their resilience and impacting them to change the behavior.

Furthermore, this study found that two research clusters refer to the authors' keywords. The main area in this study explains the main research area related to pandemic covid-19 and tourism sector such as hospitality, tourism, pandemic, covid-19 pandemic. The cluster of main research also explains in the area of management such as crisis management and the policy in the pandemic covid-19 such as lockdown, social distancing, innovation and sustainability. In addition, the keywords in the cluster discussed in geographical or the countries that have been mentioned by the authors, such as China and Spain. The finding indicated that these countries are the worst case of the pandemic covid-19 in early of a pandemic since 2020. Moreover, to try to answer the research question 3 (RQ) for the research future in tourism and pandemic covid-19 based on the conceptual research structure map, the authors can consider much research such as the word of sentiment analysis, sustainable development and nature-based on tourism. These topics can increase future research because pandemics change tourist behavior. Moreover, the study from (Brewer and Sebby, 2021) said that the pandemic covid-19 could positively influence online restaurants and purchasing intention in this sector. Furthermore, the impact of risk outbreak can enhance the consumer's confidence to choose the product in offline shopping due to pandemic covid-19 (Akhtar et al., 2020).

CONCLUSION AND LIMITATIONS

The pandemic covid-19 has been changed all of the industries in the world, including the tourism sector. The present study contributes to the research by providing information on state of art and identifying the research trends, gaps and future research agenda through several ways in the process selection, map analysis, published paper, journals, authors and institutions. It is important to search for bibliometrics for the published documents related to the research topic.

This study investigates the impact of pandemic covid-19 on tourism using the bibliometric analysis for future research agenda. The bibliometric analysis provides information and insight that can fully understand the research of impact pandemic covid-19 on tourism sector by applying the R program to answer the research questions. Our finding revealed that research on the pandemic covid-19 and tourism industry significantly increased from the documents from 2020-2021.

The study's finding can give an understanding for the academic and stakeholders in several areas of topics the impact of pandemic covid-19 on the tourism sector. The author has conducted several studies in tourism and pandemic, such as in the tourism destination (Pahrudin et al., 2021a), sustainable tourism and post-pandemic covid-19 (Higgins-Desbiolles, 2021), eco-tourism and pandemic (Buckley, 2020). In addition, several studies related to pandemic and covid-19, such as in the tourist behavior in the covid-19 pandemic period (Zheng et al., 2021), travel risk in the pandemic covid-19 period (Chen et al., 2020), social cost of tourism in the pandemic covid-19 (Qiu et al., 2020), travel risk and management perspective (Rahman et al., 2021) and tourists' behavior and non-pharmaceutical intervention and pandemic covid-19 (Pahrudin et al., 2021b).

Tourism and impact are great topics with other topics such as management, model, crisis, satisfaction, behavior, and risk. Furthermore, we identified that the future direction in the tourism area based on the pandemic covid-19 is sustainable, innovative, nature-based tourism and sustainable development. We proposed a future direction for research on pandemic covid-19 and tourism in post-pandemic. Stakeholders, government and tourism management should take advantage of the future tourism sector that will be adjusted in sustainable and nature-based tourism to avoid the spread of covid-19. It is gaining the knowledge of the papers related to covid-19 and tourism sector via bibliometric analysis using R shiny in R program. Future studies may refer to pandemics and risk in the general context in impacting the tourism sector.

Furthermore, the bibliometric analysis discusses several issues to understand the concept of the focus study, such as the most contributing author, institution, thematic map and the word clouding. Thus, this study summarized the existing research trend and found the article based on the Web of Science (WOS) database. Thus, this study can provide a guide for the researchers or for those who are interested in the concept of pandemic covid-19 and the tourism sector.

For future research agenda, it is suggested that some of the variables can be addressed in the analysis related to pandemic covid-19 and tourism, such as analyzing the pandemic covid-19 and impact on the sustainable tourism, sentiment analysis during the pandemic covid-19 in the tourism sector with a different approach. Another agenda for future research agenda in the tourism sector and pandemic covid-19 using bibliometric analysis is tourists' movement and behavior during the pandemic covid-19. This study is not without limitations. Firstly, articles were selected only from the WOS database. Future research

might be the broad scope of the study by using additional elements such as other databases (Science Direct, WOS, JSTOR, etc.). Direction for future research agenda, the study should be broad to cover the area of research related to pandemic not only the pandemic covid-19 but also the epidemic and pandemic such as SARS, HIV, and other risks with the long-term period.

REFERENCES

Akhtar, N., Nadeem Akhtar, M., Usman, M., Ali, M., & Iqbal Siddiqi, U. (2020). COVID-19 restrictions and consumers' psychological reactance toward offline shopping freedom restoration. *The Service Industries Journal*, *40*(13–14), 891–913. https://doi.org/10.1080/02642069.2020.1790535

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, *11*(4), 959–975. https://doi.org/https://doi.org/10.1016/j.joi.2017.08.007

Brewer, P., & Sebby, A.G. (2021). The effect of online restaurant menus on consumers' purchase intentions during the COVID-19 pandemic. *International Journal of Hospitality Management*, *94*, 102777. https://doi.org/https://doi.org/10.1016/j.ijhm.2020.102777

Buckley, R. (2020). Pandemic Travel Restrictions Provide a Test of Net Ecological Effects of Ecotourism and New Research Opportunities. *Journal of Travel Research*, *60*(7), 1612–1614. https://doi.org/10.1177/0047287520947812

Chen, X., Xia, E., & He, T. (2020). Influence of traveller risk perception on the willingness to travel in a major epidemic. *International Journal of Sustainable Development and Planning*, *15*(6), 901–909. https://doi.org/10.18280/ijsdp.150614

Cobo, M.J., López-Herrera, A.G., Herrera-Viedma, E., & Herrera, F. (2013). Science Mapping Software Tools: Review, Analysis, and Cooperative Study Among Tools. *Journal of the American Society for Information Science and Technology*, *64*(July), 1852–1863. https://doi.org/10.1002/asi.21525

Demiroz, F., & Haase, T.W. (2019). The concept of resilience: a bibliometric analysis of the emergency and disaster management literature. *Local Government Studies*, *45*(3), 308–327. https://doi.org/10.1080/03003930.2018.1541796

Du, H., Wei, L., Brown, M.A., Wang, Y., & Shi, Z. (2013). A bibliometric analysis of recent energy efficiency literatures: an expanding and shifting focus. *Energy Efficiency*, *6*(1), 177–190. https://doi.org/10.1007/s12053-012-9171-9

Ellegaard, O., & Wallin, J.A. (2015). The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics*, *105*(3), 1809–1831. https://doi.org/10.1007/s11192-015-1645-z

Everingham, P., & Chassagne, N. (2020). Post COVID-19 ecological and social reset: moving away from capitalist growth models towards tourism as Buen Vivir. *Tourism Geographies*, *22*(3), 555–566. https://doi.org/10.1080/14616688.2020.1762119

Farrukh, M., Meng, F., Raza, A., & Tahir, M.S. (2020). Twenty-seven years of Sustainable Development Journal: A bibliometric analysis. *Sustainable Development*, *28*(6), 1725–1737.

Feng, Y., Zhu, Q., & Lai, K.H. (2017). Corporate social responsibility for supply chain management: A literature review and bibliometric analysis. *Journal of Cleaner Production*, *158*, 296–307. https://doi.org/https://doi.org/10.1016/j.jclepro.2017.05.018

Firdaus, A., Razak, M.F.A., Feizollah, A., Hashem, I.A.T., Hazim, M., & Anuar, N.B. (2019). The rise of "blockchain": bibliometric analysis of blockchain study. *Scientometrics*, *120*(3), 1289–1331. https://doi.org/10.1007/s11192-019-03170-4

Gao, S., Meng, F., Gu, Z., Liu, Z., & Farrukh, M. (2021). Mapping and Clustering Analysis on Environmental, Social and Governance Field a Bibliometric Analysis Using Scopus. In *Sustainability* (Vol. 13, Issue 13). https://doi.org/10.3390/su13137304

Garg, K.C., & Tripathi, H.K. (2018). Bibliometrics and scientometrics in India: An overview of studies during 1995-2014 part ii: Contents of the articles in terms of disciplines and their bibliometric aspects. *Annals of Library and Information Studies*, *65*(1), 7–42. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85045658238&partnerID=40&md5=7dfccaf440369585060f283e03d03eed

He, H., & Harris, L. (2020). The impact of Covid-19 pandemic on corporate social responsibility and marketing philosophy. *Journal of Business Research*, *116*, 176–182. https://doi.org/https://doi.org/10.1016/j.jbusres.2020.05.030

Higgins-Desbiolles, F. (2021). The "war over tourism": challenges to sustainable tourism in the tourism academy after COVID-19. *Journal of Sustainable Tourism*, *29*(4), 551–569. https://doi.org/10.1080/09669582.2020.1803334

Linnenluecke, M.K., Marrone, M., & Singh, A.K. (2019). Conducting systematic literature reviews and bibliometric analyses. *Australian Journal of Management*, *45*(2), 175–194. https://doi.org/10.1177/0312896219877678

López-Fernández, M.C., Serrano-Bedia, A.M., & Pérez-Pérez, M. (2016). Entrepreneurship and Family Firm Research: A Bibliometric Analysis of An Emerging Field. *Journal of Small Business Management*, *54*(2), 622–639. https://doi.org/10.1111/jsbm.12161

Mahi, M., Mobin, M.A., Habib, M., & Akter, S. (2021). A bibliometric analysis of pandemic and epidemic studies in economics: future agenda for COVID-19 research. *Social Sciences & Humanities Open*, *4*(1), 100165. https://doi.org/https://doi.org/10.1016/j.ssaho.2021.100165

Mhlanga, O. (2018). Impacts of the macro environment on airline performances in southern Africa: Management perspectives. *Tourism and Hospitality Research*, *19*(4), 439–451. https://doi.org/10.1177/1467358418771442

Nawaz, K., Aslam, T., & Saeed, H.A. (2020). A Bibliometric Analysis of International Journal of Sports Marketing & Sponsorship. *International Journal of Business and Psychology*, *2*(1), 45–60.

Pahrudin, P., Chen, C.T., & Liu, L.W. (2021a). A modified theory of planned behavioral: A case of tourist intention to visit a destination post pandemic Covid-19 in Indonesia. *Heliyon*, *7*(10), e08230. https://doi.org/https://doi.org/10.1016/j.heliyon.2021.e08230

Pahrudin, P., Liu, L.W., Li, S.Y., & Supryadi, D.I. (2021b). Addressing the Impact of COVID-19 and Non-Pharmaceutical for Perception Tourism Using Frequentist PLS-SEMs. *Emerging Science Journal*, *5*, 197–214.

Qiu, R.T.R., Park, J., Li, S.N., & Song, H. (2020). Social costs of tourism during the COVID-19 pandemic. *Annals of Tourism Research*, *84*(June), 102994. https://doi.org/10.1016/j.annals.2020.102994

Rahman, M.K., Gazi, M.A.I., Bhuiyan, M.A., & Rahaman, M.A. (2021). Effect of Covid-19 pandemic on tourist travel risk and management perceptions. *PLOS ONE*, *16*(9), 1–18. https://doi.org/10.1371/journal.pone.0256486

Shahzad, I. A., Farrukh, M., Wu, Y., & Trunk, N. (2021). Human systems management: A retrospective of 40 years. *Human Systems Management*, *Preprint*, 1–16.

Wang, D., & Ap, J. (2013). Factors affecting tourism policy implementation: A conceptual framework and a case study in China. *Tourism Management*, *36*, 221–233. https://doi.org/https://doi.org/10.1016/j.tourman.2012.11.021

Web of Science Group. (2021). *Clarivate Analytics Company*. https://clarivate.com/webofsciencegroup/solutions/web-of-science/

Zheng, D., Luo, Q., & Ritchie, B.W. (2021). Afraid to travel after COVID-19? Self-protection, coping and resilience against pandemic 'travel fear.' *Tourism Management*, *83*, 104261. https://doi.org/https://doi.org/10.1016/j.tourman.2020.104261

Zupic, I., & Čater, T. (2014). Bibliometric Methods in Management and Organization. *Organizational Research Methods*, *18*(3), 429–472. https://doi.org/10.1177/1094428114562629