International Journal of Hospitality Management 103 (2022) 103199

Contents lists available at ScienceDirect

International Journal of Hospitality Management

journal homepage: www.elsevier.com/locate/ijhm

How does COVID-19 differ from previous crises? A comparative study of health-related crisis research in the tourism and hospitality context

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ARTICLE INFO

Keywords:
COVID-19
Disease
Pandemic
Tourism and hospitality
Systematic review
Structural topic modeling

ABSTRACT

The importance of the risk to tourism and hospitality operations from pandemic-related crises has increased. Therefore, the current study offers a literature review targeting tourism and hospitality stakeholders' perceptions of past diseases and has three objectives: (1) Explore major topics from previous research on infectious diseases using topic modeling; (2) compare non-COVID-19 and COVID-19 crises; (3) investigate research topics in the tourism and hospitality industries. To meet our research objectives, we reviewed published pandemic-related articles in the tourism and hospitality literature since the year 2000. Based on the results, we first identified nine key topics related to infectious diseases (i.e., policy, human resources, branding, resilience, technology, global or community change, risk perception, disease impact, and lifestyle). Second, we suggest the application of different topic weights in non-COVID-19 and COVID-19 research. Third, we found that it is appropriate to apply different topic weights in tourism and hospitality research.

1. Introduction

For some decades, the tourism and hospitality industries have been sensitive to and affected by external and internal factors, such as uncertainty, challenges, crises, and pandemics. An unexpected crisis (e.g., natural, financial, and health) can threaten tourism demand and harm the performance of hospitality-related companies. Chief among these may be pandemics and disease outbreaks that play significant roles in social and economic change. Compared with other industries, tourism and hospitality are particularly vulnerable to disasters and crises (Chen et al., 2021a, 2021b), with the tourism sector acknowledged as being one of the most easily affected by crises, disasters, and pandemics (Gössling et al., 2020; Yu et al., 2020).

Previous studies have concentrated on crisis-related research within hospitality and tourism context (Zenker and Kock, 2020). Most of these studies investigated crisis impacts and recoveries, with a focus on risk perception in the tourism industry (Bulin and Tenie, 2020; da Silva Lopes et al., 2021). In the tourism and hospitality contexts, existing studies have focused on disaster, crisis, and risk perception/impact/management/communication/recovery over the past decade (Bulin and Tenie, 2020; Wut et al., 2021). Health-related crisis events, decision-making, perceived risk, resilience, crisis prevention and preparedness, and the role of digital media are other prominent themes (Butler, 2020). In addition, health-related crises, the role of social media type, and extending and investigating the type of crisis/disaster/risk are the most prominent trends in the literature (Wut et al., 2021).

Health-related crisis events and risks have crucial impacts on tourism (e.g., demand) and hospitality (e.g., business performance) because hospitality and tourism play a significant role in the spread of epidemics and pandemics between regions and destinations (Sánchez-Cañizares et al., 2021). Previous epidemics and pandemics, such as severe acute respiratory syndrome (SARS), avian and swine flu/H1N1, Middle East respiratory syndrome (MERS), Ebola, and COVID-19, are noteworthy health-related crises and risk events that have affected the tourism and hospitality industries (Tew et al., 2008; Shi and Li, 2017). Epidemics and pandemics posture a major threat to society and tourism and hospitality industries, according to both tourism and health scholars, as well as government agencies and institutions (e.g., Bloom and Cadarette, 2019; Hall, 2020). The impact of epidemics and pandemics on stakeholder perspective (e.g., financial social, and emotional well-being, etc.) have started to appear and continue to emerge (Fan et al., 2018; Gössling et al., 2020).

Pandemics have been recorded throughout history. In the 21st century, the world experienced multiple epidemics, including SARS, swine

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https://doi.org/10.1016/j.ijhm.2022.103199
Received 24 August 2021; Received in revised form 25 December 2021; Accepted 1 March 2022
Available online 7 March 2022
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flu/H1N1, MERS, Ebola, and COVID-19 (see Fig. 1). Pandemics and infectious diseases, such as SARS, swine flu, avian influenza, Lyme disease, malaria, norovirus, and MERS, weaken the global economy and influence daily lives (e.g., Lee et al., 2012; Smith et al., 2011). Health crises, such as the 2003 SARS outbreak (Zeng et al., 2005; Yang and Chen, 2009) and the 2012 MERS-CoV event (Gössling et al., 2020), have disrupted international tourism. For example, the 2003 SARS epidemic negatively affected the image of Southeast Asian countries, resulting in a sharp decline in their tourism industries (Promsivapallop and Kannaovakun, 2017). Relevant studies have investigated the impacts of SARS on the tourism and hospitality industries in Asia (Kuo et al., 2008; McAleer et al., 2010). Meanwhile, the Ebola outbreak led to reduced bookings, even in Ebola-free destinations, throughout West Africa (Mizrachi and Fuchs, 2016). Previous studies have also investigated the effect of MERS on tourism demand in destinations and countries and forecasted demand using different methods and approaches (Choe et al., 2020; Shi and Li, 2017). In addition, prior studies have examined the different aspects (e.g., pandemic spreading patterns in the industry, safety and health, consumer behavior and preferences, and economic impact) of both the tourism and hospitality industries (Davahli et al., 2020; Gössling et al., 2020). Researchers have also provided systematic reviews of the published literature using different approaches, including a bibliometric analysis approach (Utkarsh and Sigala, 2021; Wut et al., 2021). Regarding the COVID-19 pandemic, past studies have conducted and published systematic review studies on tourism and hospitality (Sharma et al., 2021; Zopiatis et al., 2021) to recap and integrate COVID-19-related research in the tourism and hospitality contexts (Yang et al., 2021).

The studies do not consider or critically compare non-COVID-19 and COVID-19 crises in the tourism and hospitality industries to provide future research agendas. Historical epidemics/pandemics caused no impacts on the economy and society that were similar to those of the COVID-19 pandemic (Bai et al., 2020). Although COVID-19 pandemic had a similar origin as other pandemics, its influence has been intense and continues to spread throughout many countries (Konarasinghe, 2020). Even though studies on outbreaks have been carried out in the past, the degree and immensity of the recent pandemic are comparable to some of the greatest health catastrophes of the past (Kaushal and Srivastava, 2021). In recent years, researchers have focused on the hospitality and tourism fields in the face of the COVID-19 pandemic. Against this background, we reviewed relevant literature on the effect of prior epidemics/pandemics on the tourism and hospitality industries and compared these events to the COVID-19 pandemic. Hence, the present study aimed to compare the research landscapes of historical epidemics/pandemics with the COVID-19 pandemic. Moreover, the current study compared the hospitality and tourism industries, which are closely correlated, yet separate subfields (Yuan et al., 2014). In doing so, this study can provide more concrete suggestions for each industry stakeholder and pave the way for researchers interested in crisis and pandemic studies.

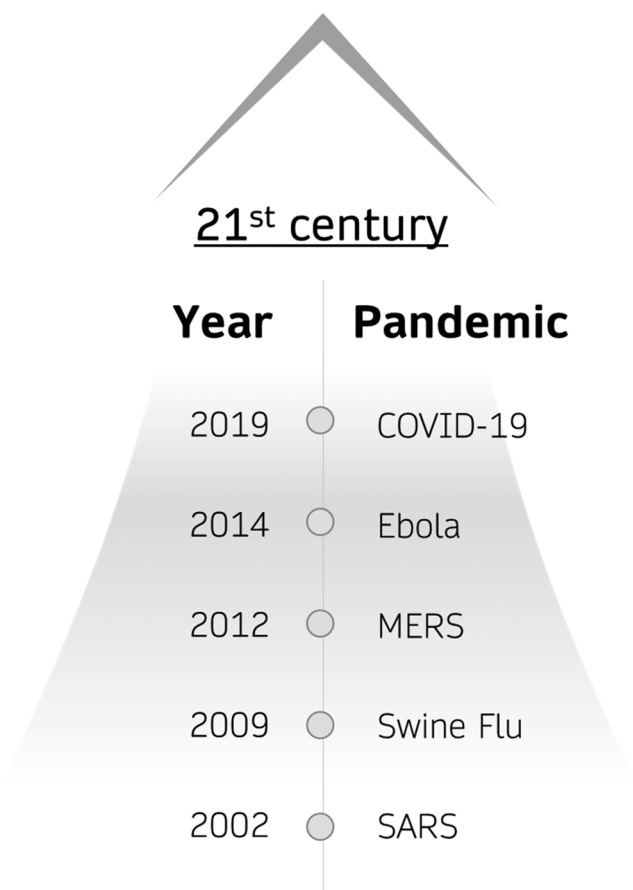

Fig. 1. History of pandemics in the 21st century (adapted from Eltarabily and Elghezanwy (2020).

Despite the significance of the risk to hospitality and tourism operations from disease-related crises, there are limited studies exploring key research topics from major infectious disease-related literature and comparing the tourism and hospitality industries. Although these studies captured topics of the moment and provided holistic views through literature reviews, they did not demonstrate whether COVID-19 research is differentiated from previous pandemic research and the specific research topics that were emphasized by non-COVID-19 research and COVID-19 research, as well as hospitality and tourism research.

To fill this gap, the present study adopted a text-mining approach, such as topic modeling, to find latent topics from the existing literature review. In recent years, topic modeling has been conducted to reveal correlated discussions in the text that can aid scholars, in order to emphasize the most significant topics addressed in the existing literature (Guerreiro et al., 2016). Thus, a comprehensive review and investigation of the past and current ongoing disease-related literature in the tourism and hospitality contexts provides new research opportunities to drive researchers in planning future studies. The specific research questions (RQs) in the present study were as follows:

RQ 1. : What are the specific research topics explored in studies on infectious diseases?

RQ 2. : How do these topics differ between the non-COVID-19 and COVID-19 crises?

RQ 3. : How are the research topics of tourism and hospitality different?

2. Methodology

2.1. Data collection

COVID-19, as the most recent pandemic, differs from prior health crises based on a search of published disease-related articles within the hospitality and tourism contexts. All the data were retrieved from the Web of Science database. First, a keyword search was conducted on pandemic research across all disciplines since 2000. Following Chen et al. (2021a), (2021b), the following set of keywords was utilized to search documents: “covid” OR “epidemic” OR “pandemic” OR “infections” OR “infectious” OR “disease outbreak.” Next, articles belonging to the category of “hospitality, leisure, sport & tourism” were selected to retain only the tourism and hospitality research. After downloading the data, more filtering was performed. Articles published in sports journals were excluded, as were non-studies, such as editorial materials and letters, leaving only research articles and review articles

for data analysis. The corpus for the data analysis included 366 documents.

2.2. Classification of documents by disease type and discipline

The filtered documents were divided into two categories: COVID-19 and other diseases. The keywords "coronavirus," "covid-19," and "covid" were used to search for obvious COVID-19-related articles, after which studies that did not contain coronavirus-related terms in their titles, keywords, or abstracts were manually reviewed to classify them into the COVID-19 or other-diseases (non-COVID-19) groups, resulting in 328 COVID-19-related documents and 38 non-COVID-19 documents. Most documents published between 2020 and 2021 were related to COVID-19. Table 1 summarizes the frequency of documents related to COVID-19 and other diseases.

Two individual lexicons, one hospitality-related (e.g., restaurant, hotel, hospitality) and one tourism-related (e.g., tourism, tourist, leisure), were built to illuminate the differences between these two academic fields. When documents were found to contain tourism or hospitality keywords in their titles or abstracts, they were classified into the corresponding lexicons. After the initial classification, the documents were analyzed manually, especially those containing both tourism and hospitality keywords (or those containing no such keywords), to perform proper classification.

Table 1
Frequency of documents on COVID-19 and other types of disease.

Type of disease	Frequency	Exemplary article
COVID-19	328	Park, E., Kim, W.-H., & Kim, S.-B. (2020). Tracking tourism and hospitality employees' real-time perceptions and emotions in an online community during the COVID-19 pandemic. *Current Issues in Tourism*, 1–5.
Severe acute respiratory syndrome (SARS)	17	Chen (2011). The response of hotel performance to international tourism development and crisis events. *International Journal of Hospitality Management*, *30*(1), 200–212.
H1N1 influenza (Swine flu)	6	Lee et al., (2012). The impact of non-pharmaceutical interventions for 2009 H1N1 influenza on travel intentions: A model of goal-directed behavior. *Tourism Management*, *33*(1), 89–99.
Infectious disease (public health)	6	Hanrahan and Melly (2019). Biosecurity risk and tourist communication in Ireland. *European Journal of Tourism Research*, *22*, 45–61.
Avian influenza (H7N9/H5N1 infection)	4	Rittichainuwat and Chakraborty (2009). Perceived travel risks regarding terrorism and disease: The case of Thailand. *Tourism Management*, *30*(3), 410–418.
Ebola virus	3	Novelli et al. (2018). 'No Ebola… still doomed'–The Ebola-induced tourism crisis. *Annals of Tourism Research*, *70*, 76–87.
Middle East respiratory syndrome (MERS)	2	Shi and Li (2017). Impact of unexpected events on inbound tourism demand modeling: Evidence of Middle East Respiratory Syndrome outbreak in South Korea. *Asia Pacific Journal of Tourism Research*, *22*(3), 344–356.
Sexual health	2	Freidus (2017). Unanticipated outcomes of voluntourism among Malawi's orphans. *Journal of Sustainable Tourism*, *25*(9), 1306–1321.
Lyme	1	Donohoe et al. (2015). Lyme disease: Current issues, implications, and recommendations for tourism management. *Tourism Management*, *46*, 408–418.
Malaria	1	James Reilly (2019). Northern European patterns of visiting Rome, 1400–1850. *Journal of Tourism History*, *11*(2), 101–123.
Norovirus	1	Liu et al., (2019). Cruise line customers' responses to risk and crisis communication messages: An application of the risk perception attitude framework. *Journal of travel research*, *58*(5), 849–865.
Total number of documents	366	

Note: As some articles address multiple diseases, the total number of documents classified into the non-COVID-19 group can exceed the sum of the non-COVID-19 documents

2.3. Topic modeling analysis

Prior to the topic modeling, the data were processed and cleaned. As the title, keywords, and abstract contain the main themes of any research article, these elements were concatenated into one unit for topic modeling analysis. Prior studies used topic modeling to uncover correlated discussions in the text that can help scholars focus on the important themes in the literature (Moro et al., 2015; Guerreiro et al., 2016). The concatenated documents were cleaned using the Natural Language Toolkit (NLTK) in Python. After removing non-alphabetic and non-numeric characters, all English characters were converted into lowercase characters. The NLTK stop words and custom stop words were removed. Part-of-speech tagging was applied to all nouns, verbs, adverbs, and adjectives for lemmatization and bigram/trigram creation.

R-based topic modeling, a form of structural topic modeling (STM), was conducted with the processed documents and the metadata to discover major topics. To build the model, the model performances of topic models with different topic numbers (K = 3, 4, 5, 6, … 29, 30) were compared. The quantitative-performance index, or held-out probability score, proved to be best when the topic number was nine. The higher held-out likelihood indicates that the trained model estimated the held-out documents more accurately than the other trained models with different numbers of topics (Wallach et al., 2009). The final topic model was, thus, built with nine topics, with a maximum iteration number of 50 and the standard "spectral" initialization type. Other model parameters, such as alpha, gamma, and sigma, were set to default values.

After building the model, the machine generated sets of words belonging to the nine topics, before calculating the association between each article and the nine topics. The top words for each of the nine topics and the highly associated documents for each topic were reviewed to determine the nature of the topics. The documents were based on two criteria: (1) Whether articles were related to COVID-19 or other diseases; (2) the tourism or hospitality contexts. These categorizations were used as document-level metadata (or covariates) to estimate the associations between covariates and topic proportions. Structural topic modeling has a function called "estimateEffect," which enables regression estimation using document-level topic proportions and metadata. As STM computes the topic proportions while considering document-level covariates, STM users can compare the differences in topic proportions by document-level covariates. Hence, this study was able to compare the disease types and membership in the tourism/hospitality disciplines. Fig. 2 presents the methodological framework of this study.

3. Results

3.1. Description of health-crisis literature

Table 2 summarizes the inspected articles categorized by journal, disease type, and industry. More studies were found in the tourism field than in the hospitality field. The *International Journal of Hospitality Management (IJHM)* had the highest number of COVID-19-related publications, followed by *Current Issues in Tourism (CIT)* and *Tourism Geographies (TG)*. All three of these journals launched special issues regarding COVID-19, making their prominence unsurprising. Consistent with the focuses of the journals, most articles published in the *IJHM* fell within the hospitality context. Tourism-based articles outnumbered hospitality-context articles in both CIT and TG.

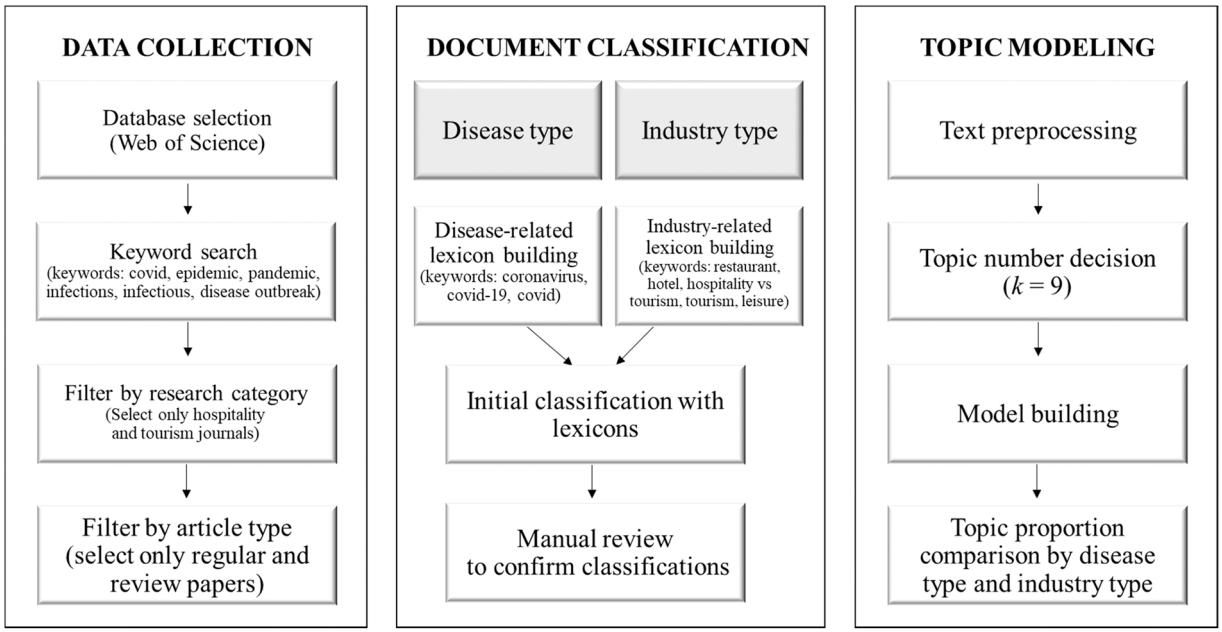

Fig. 2. Methodological framework.

3.2. Characteristics of studies

The articles were classified by type of study, methods, data type, and study site (Table 3). While all non-COVID-19 studies were empirical, nearly one third of COVID-19 studies were conceptual. Most non-COVID-19 studies implemented a quantitative approach (63.2%) using secondary data (48.7%). Many of these studies with secondary data investigated the impact of disease on tourism demand (Shi and Li, 2017; Tang and Lau, 2017) or corporate performance (Wu et al., 2010). The number of non-COVID-19 studies targeting Asian countries outnumbered those from other sites. Among studies related to previous pandemics or health-related risks, the number of studies on SARS was the highest, and the detrimental impact of SARS was greatest among Asian countries, which accounts for the high frequency of studies with backgrounds in Asia.

Most non-COVID-19 studies explored how health-related risks can influence the hospitality or tourism industries. These studies were grounded in risk perception theory (Liu-Lastres et al., 2019) and catastrophe theory (Mao et al., 2010). These theories account for how unexpected but large-scale risks can influence the industries.

Among the studies on COVID-19, 34% of them implemented a quantitative approach, which is the greatest among the COVID-19 studies, but still far below the non-COVID-19 studies using a quantitative approach. Notably, the proportion of opinion or conceptual studies among COVID-19 studies was high, accounting for nearly 30% of the total number of COVID-19 studies. The COVID-19 pandemic, which was unprecedented and differentiated from previous pandemics, caused significant changes in the tourism and hospitality landscapes. Because of the lack of understanding of the pandemic and reliable data, especially in the early stages, opinion or conceptual studies heavily relying on experts' insights were invited and accepted from many hospitality and tourism journals. Similar to non-COVID-19 studies, the study sites of most COVID-19 studies were Asian countries (29.5%), followed by American (14.8%) and European (12.3%) countries.

A unique characteristic of COVID-19 studies compared to non-COVID-19 studies was that COVID-19 studies utilized much more diverse types of data. While non-COVID-19 studies using qualitative methods mostly utilized interviews or open-ended surveys, COVID-19 studies used various data, such as government/corporate documents/news ($N = 17$) and social media/online platforms ($N = 15$), along with interviews or open-ended surveys ($N = 58$) and literature ($N = 8$). In the case of secondary data for the quantitative method, alternative data other than national statistics or performance data were used, such as home-based employment data (Huang et al., 2020a), mobile data (Jeon and Yang, 2021), foot traffic, and card transaction data (Yang et al., 2020).

While COVID-19 studies adopted an exploratory approach, other studies have been developed based on theories. Theories that address risk perceptions and associated behaviors have been implemented frequently, such as the risk perception attitude framework (Liu-Lastres et al., 2021), perceived risk theory (Choe et al., 2021; Vo-Thanh et al., 2020), and protection motivation theory (Zheng et al., 2021). In addition, research topics on COVID-19 studies were more extensive than for non-COVID-19 studies, suggesting how to deal with risks and issues regarding the COVID-19 pandemic based on theories, such as social exchange theory (Chen et al., 2021a, 2021b; Lee et al., 2021), conservation of resources theory (Chen and Eyoun, 2021; Mao et al., 2021), empowerment theory (Cheng et al., 2021), and occupational stigma theory (Mejia et al., 2021). The empirical evidence supporting a more extensive range of research topics on COVID-19 studies than non-COVID-19 studies is presented in the next section (Tables 5 and 6).

3.3. Research topic discovery

Table 4 lists the average topic weights and top words associated with each topic. The topic modeling revealed the following nine research topics in the previous literature on infectious diseases: Policy (Topic 1), human resources (Topic 2), branding (Topic 3), resilience (Topic 4), technology (Topic 5), global or community change (Topic 6), risk perception (Topic 7), disease impact (Topic 8), and lifestyle (Topic 9).

Out of these nine topics, Topic 6 (global or community change) was the most prevalent, accounting for approximately 17% of the total topic weights. Due to the unprecedented nature of COVID-19, the world has undergone significant changes, given COVID-19′s global reach. Compared to other diseases, COVID-19 has brought tremendous transformations in various areas of the human lifestyle. Articles related to Topic 6 addressed changes in the paradigms of the tourism and hospitality industries and/or perspectives on post-COVID-19 life. For instance, a paper entitled *Transforming the (tourism) world for good and (re)generating the potential 'new normal'* (Ateljevic, 2020) introduced a

Table 2
Classification of articles by journal, disease type, and industry.

Journal	Disease type		Industry		Sum
	Non-COVID-19	COVID-19	Tourism sector	Hospitality sector	
INTERNATIONAL JOURNAL OF HOSPITALITY MANAGEMENT	4	65	6	63	69
CURRENT ISSUES IN TOURISM	2	48	43	7	50
TOURISM GEOGRAPHIES	0	27	27	0	27
INTERNATIONAL JOURNAL OF CONTEMPORARY HOSPITALITY MANAGEMENT	1	23	6	18	24
JOURNAL OF SUSTAINABLE TOURISM	1	18	16	3	19
TOURISM RECREATION RESEARCH	0	14	10	4	14
TOURISM MANAGEMENT	9	4	13	0	13
ANATOLIA-INTERNATIONAL JOURNAL OF TOURISM AND HOSPITALITY RESEARCH	1	9	5	5	10
WORLDWIDE HOSPITALITY AND TOURISM THEMES	0	10	8	2	10
WORLD LEISURE JOURNAL	0	9	9	0	9
LEISURE SCIENCES	0	8	8	0	8
TOURISM AND HOSPITALITY RESEARCH	0	8	6	2	8
JOURNAL OF HOSPITALITY AND TOURISM MANAGEMENT	2	5	2	5	7
JOURNAL OF HOSPITALITY AND TOURISM INSIGHTS	1	5	5	1	6
JOURNAL OF TRAVEL RESEARCH	3	3	6	0	6
TOURISM MANAGEMENT PERSPECTIVES	2	4	5	1	6
TOURISM REVIEW	0	6	6	0	6
ASIA PACIFIC JOURNAL OF TOURISM RESEARCH	5	0	3	2	5
INTERNATIONAL JOURNAL OF TOURISM RESEARCH	2	3	5	0	5
JOURNAL OF HOSPITALITY & TOURISM RESEARCH	0	5	1	4	5
ANNALS OF TOURISM RESEARCH	1	3	4	0	4
JOURNAL OF DESTINATION MARKETING & MANAGEMENT	0	4	4	0	4
JOURNAL OF POLICY RESEARCH IN TOURISM LEISURE AND EVENTS	0	4	4	0	4

Table 2 (*continued*)

Journal	Disease type		Industry		Sum
	Non-COVID-19	COVID-19	Tourism sector	Hospitality sector	
ANNALS OF LEISURE RESEARCH	0	3	3	0	3
EUROPEAN JOURNAL OF TOURISM RESEARCH	1	2	2	1	3
INFORMATION TECHNOLOGY & TOURISM	0	3	2	1	3
JOURNAL OF CONVENTION & EVENT TOURISM	0	3	3	0	3
JOURNAL OF TRAVEL & TOURISM MARKETING	1	2	2	1	3
LEISURE STUDIES	0	3	3	0	3
ANAIS BRASILEIROS DE ESTUDOS TURISTICOS-ABET	0	2	2	0	2
JOURNAL OF HERITAGE TOURISM	0	2	2	0	2
JOURNAL OF QUALITY ASSURANCE IN HOSPITALITY & TOURISM	0	2	1	1	2
PLACE BRANDING AND PUBLIC DIPLOMACY	0	2	2	0	2
TOURISM PLANNING & DEVELOPMENT	0	2	2	0	2
TOURIST STUDIES	0	2	2	0	2
ADVANCES IN HOSPITALITY AND TOURISM RESEARCH-AHTR	0	1	1	0	1
CORNELL HOSPITALITY QUARTERLY	0	1	1	0	1
EUROPEAN JOURNAL OF TOURISM HOSPITALITY AND RECREATION	1	0	1	0	1
EVENT MANAGEMENT	0	1	1	0	1
GRAN TOUR	0	1	1	0	1
INTERNATIONAL JOURNAL OF CULTURE TOURISM AND HOSPITALITY RESEARCH	0	1	0	1	1
INTERNATIONAL JOURNAL OF EVENT AND FESTIVAL MANAGEMENT	0	1	1	0	1
INTERNATIONAL JOURNAL OF TOURISM CITIES	0	1	1	0	1
JOURNAL OF CHINA TOURISM RESEARCH	0	1	1	0	1
JOURNAL OF HOSPITALITY MARKETING & MANAGEMENT	0	1	0	1	1
JOURNAL OF PLACE MANAGEMENT AND DEVELOPMENT	0	1	1	0	1
JOURNAL OF TOURISM FUTURES	0	1	1	0	1

(*continued on next page*)

Table 2 (*continued*)

Journal	Disease type		Industry		Sum
	Non-COVID-19	COVID-19	Tourism sector	Hospitality sector	
JOURNAL OF TOURISM HISTORY	1	0	1	0	1
JOURNAL OF VACATION MARKETING	0	1	1	0	1
SCANDINAVIAN JOURNAL OF HOSPITALITY AND TOURISM	0	1	1	0	1
TOURISM	0	1	1	0	1
TOURISM REVIEW INTERNATIONAL	0	1	1	0	1
Sum	38	328	243	123	366

Table 3
Articles classified by method, data type, and study site.

Criterion	Non-COVID-19		COVID-19		Total	
	N	%	*N*	%	*N*	%
Type of study						
Empirical	38	100.00%	220	67.1%	258	70.5%
Conceptual	0	0.00%	108	32.9%	108	29.5%
Method						
Quantitative	24	63.2%	124	33.9%	148	40.4%
Qualitative	13	34.2%	75	20.5%	88	24.0%
Opinion/review	0	0.00%	108	29.5%	108	29.5%
Mixed method	1	2.6%	20	5.5%	21	5.7%
Field study	0	0.00%	1	0.3%	1	0.3%
Data type[1)]						
Survey	6	15.4%	116	33.1%	122	31.4%
Interviews/open-ended surveys	9	23.1%	58	16.6%	67	17.2%
Secondary data	19	48.7%	26	7.4%	45	11.6%
Government/corporate documents/news	1	2.6%	17	4.9%	18	4.6%
Social media, online platforms	1	2.6%	15	4.3%	16	4.1%
Literature	3	7.7%	8	2.3%	11	2.8%
Experiment	0	0.0%	2	0.6%	2	0.5%
Not applicable	0	0.00%	108	30.9%	108	27.8%
Study site						
Asia	22	57.9%	86	26.2%	108	29.5%
America	6	15.8%	48	14.6%	54	14.8%
Europe	3	7.9%	42	12.8%	45	12.3%
Oceania	1	2.6%	11	3.4%	12	3.3%
Africa	3	7.9%	4	1.2%	7	1.9%
Middle East	0	0.0%	1	0.3%	1	0.3%
Global (Multiple sites)	1	2.6%	32	9.8%	33	9.0%
Not specified or not applicable	2	5.3%	104	31.7%	106	29.0%

Note: [1]) Studies that implemented mixed methods counted multiple times

regenerative paradigm for considering how the tourism industry can emerge from the epidemic after a positive transformation. The average topic weight of Topic 1 (policy) was 0.15, making it the second most prevalent. As shown in its top words (e.g., government, strategic, policy, recovery, planning, etc.), the articles on this topic tackled strategies for recovering from the detrimental impact of COVID-19. Many of these articles adopted various data sources to more accurately comprehend the circumstances of the era. For instance, Şengel et al. (2020) performed a content analysis of COVID-19-related news from March and April 2020. Yang and Han (2021) analyzed tweets with hospitality-related hashtags to understand the real-time perceptions associated with the pandemic, with the aim of helping hospitality practitioners develop recovery strategies. Looking beyond the efforts of the industry itself, Do et al. (2021) emphasized the importance of

Table 4
Summary of topics: Top words and topic weights.

Topic label	Top words	Topic weight estimate	Std. error	Number of documents
T1 Policy	government, strategic, policy, recovery, planning	0.15	0.24	57
T2 Human resources	employee, organizational, work, job, fear	0.09	0.22	31
T3 Branding	brand, loyalty, private, preference, satisfaction	0.08	0.21	29
T4 Resilience	resilience, optimism, corporate, capital, csr	0.08	0.20	31
T5 Technology	robot, technology, cleanliness, innovation, interaction	0.09	0.20	32
T6 Global or community change	community, global, world, lockdown, space, time, environmental	0.17	0.27	74
T7 Risk perception	risk, risk_perception, traveler, visit, travel_intention	0.13	0.25	46
T8 Disease impact	disease, flu, estimate, inbound_tourism, resident	0.13	0.24	47
T9 Lifestyle	home, student, lifestyle, digital, discrimination	0.07	0.19	19

Note: Documents were counted based on the maximum topic weight

financial assistance from governments for COVID-19 crisis recovery.

Topics 7 (risk perception) and 8 (disease impact) accounted for approximately 13% of the total topic weights. Articles on Topic 7 (risk perception) illustrated the escalated perceived risks caused by the pandemic, demonstrating how these perceived risks can influence people's perceptions and behaviors. Articles related to Topic 8 (disease impact) estimated the effect of diseases on the performance of hospitality-related firms or tourism demand. These two topics were unique because most non-COVID-19 articles were associated with them. A more detailed comparison between COVID-19 and non-COVID-19 documents is presented in Section 3.4.

In addition, the model revealed topics related to human resources (Topic 2), branding (Topic 3), resilience (Topic 4), technology (Topic 5), and lifestyle (Topic 6). With the escalating threat of COVID-19 in the hospitality and tourism industries, the pandemic has affected employees in these sectors. On Topic 2 (human resources), Park et al. (2020) analyzed online communities of hospitality employees and identified changes in their emotions related to major COVID-19 issues. Another study by He et al. (2020) addressed employee fears and raised awareness of the organizational role of supporting employees during the crisis. Articles related to Topic 3 (branding) examined customers' attitudes or loyalty to emerging businesses in the pandemic era (Ahn, 2021), message framing or communication strategies in the COVID-19 context (Huang et al., 2020b; Jiménez-Barreto et al., 2021; Rossolatos, 2020a), or similarly challenged place branding (Lee and Kim, 2020; Rossolatos, 2020b). Although COVID-19 affected the tourism and hospitality sectors, many articles related to Topic 4 (resilience) provided optimistic outlooks, emphasizing tourism and hospitality resilience (Ntounis et al., 2021; Prayag, 2020; Sobaih et al., 2021; Traskevich and Fontanari, 2021).

Although technology has been a major trend in the tourism and hospitality industries—even in the literature prior to COVID-19 (Yung and Khoo-Lattimore, 2019)—it is apparent that COVID-19 accelerated technology implementation and its acceptance by customers, most notably related to service robots (Cha, 2020; Christou et al., 2020; Seyitoğlu and Ivanov, 2020), self-service kiosks (Oliveira et al., 2021), virtual reality (Pillai et al., 2021; Yung et al., 2021), and new technology to reduce COVID-19 risks (Kim et al., 2021; Lau, 2020).

Table 5
Comparison of topic weights between COVID-19 and other epidemics.

	Topic weight				Mean difference	Std. error	95% Confidence interval	
	Non-COVID-19		COVID-19					
Topic	Estimate	Std. error	Estimate	Std. error			Lower	Upper
T1 Policy	0.08	0.04	0.15	0.01	0.07	0.04	-0.02	0.15
T2 Human resources	0.02	0.04	0.11	0.01	0.09	0.04	0.01	0.17
T3 Branding	0.03	0.04	0.10	0.01	0.06	0.04	-0.01	0.14
T4 Resilience	0.03	0.03	0.10	0.01	0.07	0.04	0.00	0.14
T5 Technology	0.07	0.04	0.10	0.01	0.03	0.04	-0.04	0.11
T6 Global or community change	0.06	0.04	0.16	0.02	0.10	0.05	0.01	0.19
T7 Risk perception	0.21	0.04	0.12	0.01	-0.09	0.04	-0.18	-0.01
T8 Disease impact	0.48	0.05	0.09	0.01	-0.39	0.05	-0.48	-0.29
T9 Lifestyle	0.03	0.03	0.09	0.01	0.06	0.03	-0.01	0.13

Table 6
Comparison of topic weights between the tourism and hospitality literature.

	Topic weight				Sig.	Std. error	95% Confidence interval	
	Hospitality		Tourism					
Topic	Estimate	Std. error	Estimate	Std. error			Lower	Upper
T1 Policy	0.15	0.02	0.14	0.02	0.01	0.03	-0.05	0.06
T2 Human resources	0.20	0.02	0.05	0.01	0.15	0.03	0.10	0.20
T3 Branding	0.13	0.02	0.07	0.01	0.07	0.03	0.02	0.12
T4 Resilience	0.11	0.02	0.08	0.01	0.04	0.03	-0.02	0.09
T5 Technology	0.13	0.02	0.07	0.01	0.06	0.03	0.01	0.11
T6 Global or community change	0.06	0.02	0.20	0.02	-0.13	0.03	-0.20	-0.08
T7 Risk perception	0.08	0.02	0.15	0.02	-0.08	0.03	-0.14	-0.02
T8 Disease impact	0.07	0.02	0.16	0.02	-0.09	0.03	-0.15	-0.03
T9 Lifestyle	0.07	0.02	0.09	0.01	-0.02	0.02	-0.07	0.02

Finally, articles examining changes in lifestyle (Topic 9) are an important research stream. The top words for Topic 9 indicated that the impact of epidemics or diseases may not be limited perceptions or behaviors in the tourism and hospitality contexts, but could extend to how people live their ordinary daily lives. For instance, Wen et al. (2020) examined the short- and long-term effects of the COVID-19 outbreak on tourists' travel behaviors and lifestyles, such as preferred transportation services or food-service-delivery methods. Cho et al. (2020) studied the emergence of meal kits, suggesting customers who enjoyed convenience and food quality might prefer this product type, especially in the pandemic era. In addition to disease-oriented changes in people's behaviors, Topic 9 also addressed changes in perceptions. Yang and Wong (2020) pointed out the elephant in the room: Discrimination against certain tourist groups during the COVID-19 pandemic. They argued that the original value of travel—psychological well-being —was severely undermined by threats of tourist discrimination.

3.4. Comparison of non-COVID-19 and COVID-19 research

Table 5 reports the differences in average topic weights between non-COVID-19 and COVID-19 research. The visualization in Fig. 3 shows which topics are more prevalent, that is, non-COVID-19 or COVID-19 research. For four topics, that is, policy (Topic 1), branding (Topic 3), technology (Topic 5), and lifestyle (Topic 9), although topic weights were higher among COVID-19 articles than non-COVID-19 articles, no significant difference was found. This result indicates that these topics

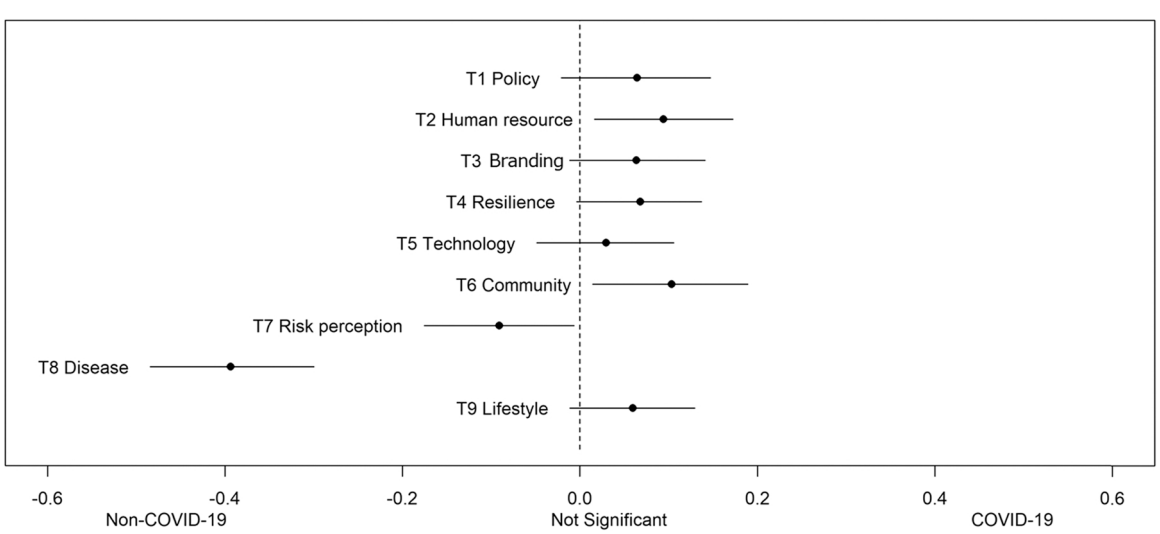

Fig. 3. Differences in topic weights between COVID-19 and other epidemics.

appeared more frequently among COVID-19 articles than non-COVID-19 articles, but the difference was not great enough to lead to a statistical significance.

Meanwhile, Topics 7 (risk perception) and 8 (disease impact) skew toward non-COVID-19, indicating that these were the most popular topics in articles on non-COVID-19 events. For example, in this tranche of the literature, Topic 7 concentrated mostly on the risk perspectives of a broad range of diseases. Given that infectious diseases or epidemics can increase the perceived risks of travelers or customers, many non-COVID-19 articles in Topic 7 focused on how diseases could enhance people's perceived risks. For instance, Mizrachi and Fuchs (2016) investigated online discourses in social media to record tourists' perceived risks related to an Ebola outbreak. Liu-Lastres et al. (2019) conducted an experiment on a norovirus outbreak and discovered that people's beliefs about their safety from norovirus infection could influence their cruise travel intentions.

Additional text network analysis was conducted with documents associated with Topic 7 to obtain detailed information about this topic composition (Figs. 4 and 5). As shown in Fig. 4, compared to the non-COVID-19 articles in Topic 7, the COVID-19-related articles on risk perceptions tackled more varied issues in the relationships within the perceived risks of COVID-19, such as the impacts on travel anxiety (Quintal et al., 2021), destination choice (Karl et al., 2020), and travel intentions (Perić et al., 2021; Xie et al., 2021). This supposition was confirmed by the more complex network structure of COVID-19 articles on risk perception than those in non-COVID-19 articles.

Topic 8 (disease impact) was also more prevalent in non-COVID-19 articles (Fig. 5). Forecasting or econometrics have been widely applied to estimate the impacts of various diseases on the performance of hospitality-related firms (e.g., Chen, 2011; Kim et al., 2020) or levels of tourism demand (e.g., Kuo et al., 2008; Page et al., 2012; Shi and Li, 2017; Tang and Lau, 2017). Most articles related to Topic 8 considered epidemics as unprecedented events that could influence tourism demand or hospitality firms' performance levels. These articles utilized epidemics as variables to improve the performance of forecasts or estimations. Frequent words in non-COVID-19 articles in Topic 8 tended to be related to tourism demand forecasting (e.g., inbound tourism, arrival, destination) and financial performance (e.g., financial, economic, performance, and determinant). There were notably fewer attempts to use COVID-19 as a determinant in a forecasting model than with other diseases, possibly as COVID-19 is not yet over and the world is still in the process of dealing with its multiple waves and variants, unlike with previous, now-concluded epidemics. Therefore, researchers may be cautious about estimating the impact of COVID-19, as it is still an evolving event.

The remaining topics had higher topic weights among COVID-19 research than among non-COVID-19 research, particularly Topic 2 (human resources), Topic 4 (resilience), and Topic 6 (global or community change). In fact, all 31 articles related to Topic 2 were related to COVID-19. Similarly, all but one of the 72 articles on Topic 6 (global or community change) focused on COVID-19. In contrast, for Topic 4 (resilience), only one document out of 31 was on COVID-19. These findings indicate that the sub-topics addressed in COVID-19 articles proved to be more diverse than those in previous articles on other diseases.

3.5. Comparison of tourism and hospitality research

Table 6 and Fig. 6 illustrate the clear skew in research topics between tourism and hospitality research. It can be argued that hospitality and tourism research are distinct from each other. However, it is apparent that hospitality-oriented and tourism-oriented studies tend to focus on distinct industries and research topics (Oh et al., 2004). Hence, this study took a comparative approach to compare the research topics emphasized by hospitality- or tourism-oriented studies.

Out of the nine topics, research topics related to human resource management (Topic 2), branding (Topic 3), and technology (Topic 5) were more prevalent in the hospitality literature. A previous systematic review of hospitality marketing revealed that the popularity of e-marketing and IT research topics was second highest among hospitality studies, followed by the consumer behavior research topic, and the popularity of branding research had increased (Yoo et al., 2011). A more recent study also revealed that the popularity of IT research increased, along with a continuing increase in the branding research topic (Park et al., 2018). Despite the devastating impact of the pandemic, many researchers and industry experts view this crisis as an opportunity for innovation, accelerating interest in IT research in the hospitality context that existed prior to COVID-19 (Seyitoğlu and Ivanov, 2020).

The major focus of Topic 2 (human resources) was differentiated from previous studies on human resource management, which were

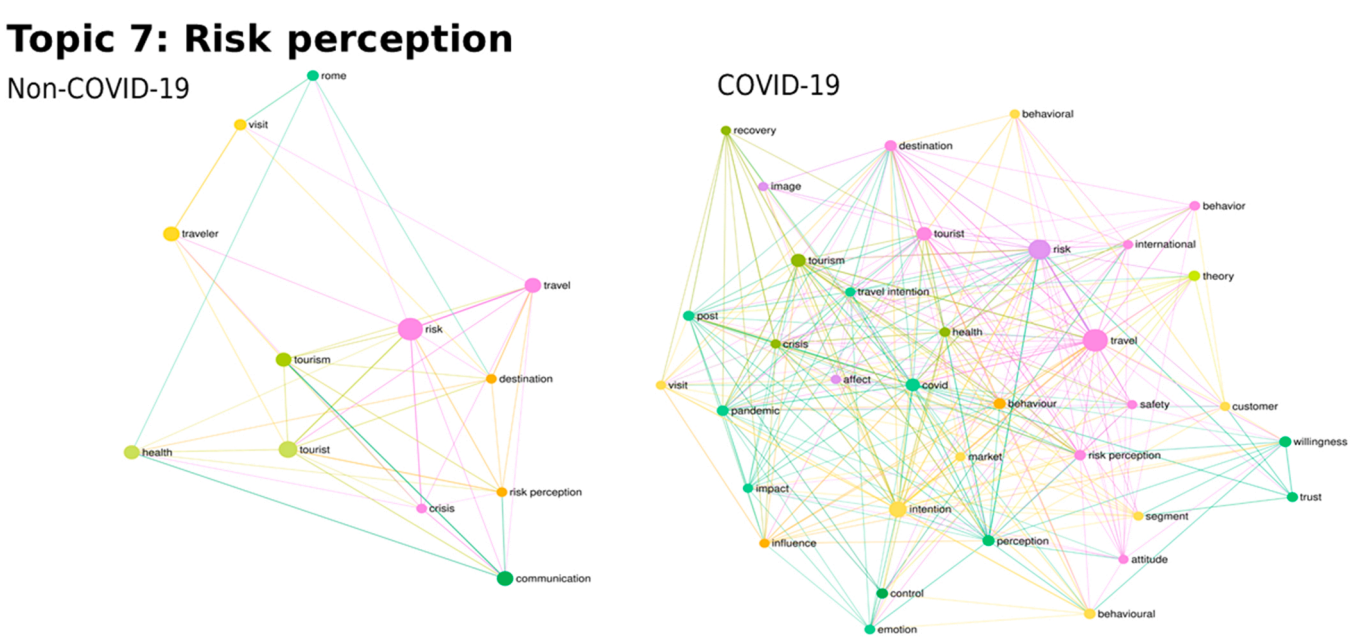

Fig. 4. Text network analysis of Topic 7 (Left: Non-COVID-19, Right: COVID-19).

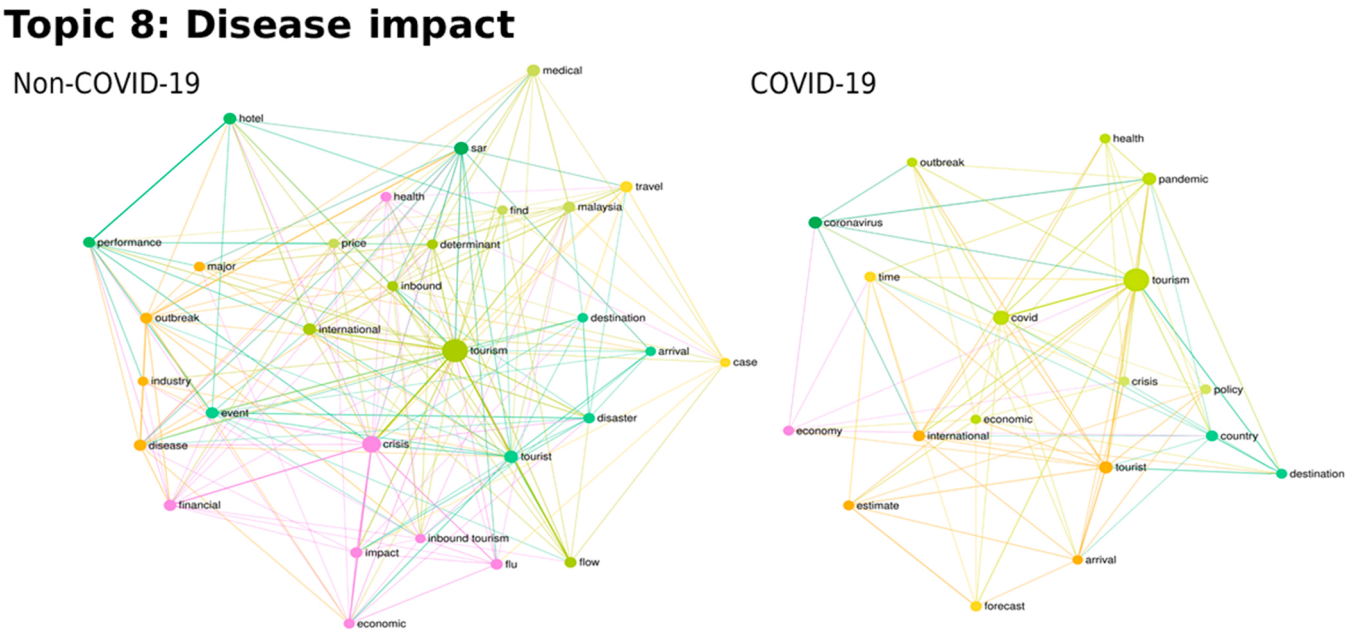

Fig. 5. Text network analysis of Topic 8 (Left: Non-COVID-19, Right: COVID-19).

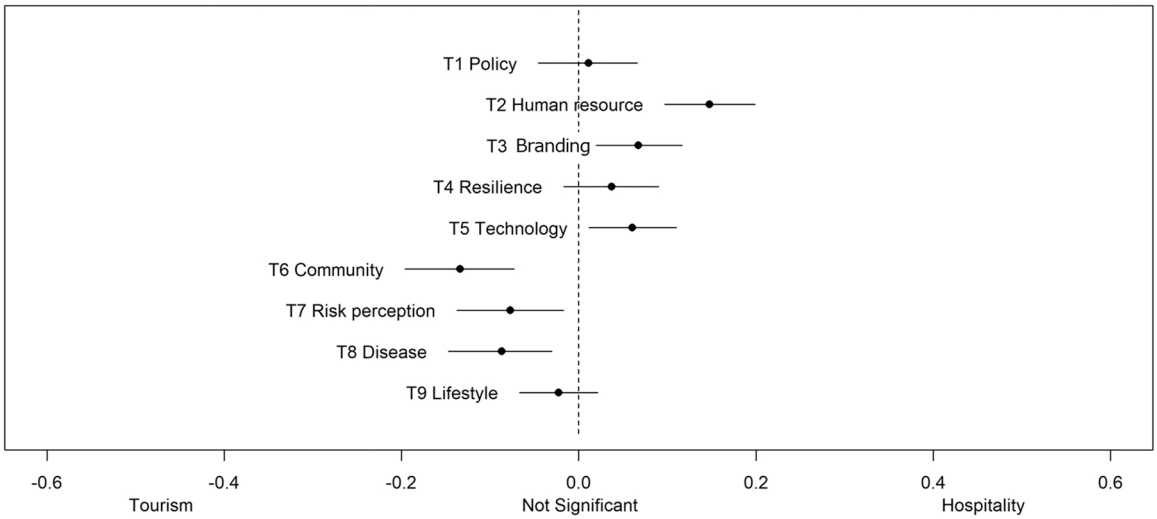

Fig. 6. Differences in topic weights between tourism and hospitality studies.

conducted during ordinary non-pandemic periods. According to a systematic review of human resource management in the tourism and hospitality contexts, the major research goals were: (1) To identify the association between human resources and a company's performance, and (2) to measure the effectiveness of human resource practices or training programs at the micro- and macro-levels (Madera et al., 2017). Most of these studies are grounded in the notion that effective human resource management can enhance firm performance. In the present review, however, human-resource-management studies related to COVID-19 focused considerably on the protection of or care for employees, with the mental and physical health of employees rising to the fore (Cheng et al., 2021; Chua et al., 2020; He et al., 2020; Yu et al., 2021a) and job stability close behind (Jung et al., 2021; Yu et al., 2021b).

The following three topics, Topic 6 (global or community change), Topic 7 (risk perception), and Topic 8 (disease impact), were more prevalent in tourism than in hospitality research. These topics were more closely related to macro perspectives about COVID-19-related changes. Topic 6 (global or community change) discusses paradigm shifts after COVID-19 and its industry- and global-wide impacts (e.g., Ateljevic, 2020; Higgins-Desbiolles, 2020). The exemplary articles related to tourists' risk perceptions were "Which travel risks are more salient for destination choice? An examination of the tourist's decision-making process" (Karl et al., 2020) and "The effects of risk message frames on post-pandemic travel intentions: the moderation of empathy and perceived waiting time" (Xie et al., 2021), which investigated travelers' perceptions and behavioral intentions during the COVID-19 pandemic. For Topic 8 (disease impact), previous studies related to non-COVID-19 were mainly interested in how health-related risks affected tourism demand (Kuo et al., 2008; Wang, 2009). In response to COVID-19, Moosa and Khatatbeh (2021) investigated the relationship between international tourist arrivals and the fatality rate of destinations. Since COVID-19 was still in progress and tourism demand could have been misrepresented due to travel bans, Díaz-Sánchez and Obaco (2020) focused on domestic tourism using the National Park entrance fee as a proxy for domestic tourism demand.

4. Discussion

COVID-19, which has been around for nearly two years, is clearly different from the previous health-related risks to hit the hospitality and tourism industries. The impact of COVID-19 was more global and industry-wide than previous health risks, necessitating drastic actions on social and business policies and individual lifestyles. Although previous studies have examined risk, crisis, disaster management/impacts/perception, and post-crisis/recovery strategies, the implemented methodology, topics, and implications may vary from the COVID-19 studies. Hence, this study conducted a comparative study to compare the non-COVID-19 and COVID-19 literature, investigating the differing research topics in the tourism and hospitality industries to provide more concrete and relatable implications for each industry.

Prior studies related to non-COVID-19 infectious diseases have emphasized empirical evidence, particularly using a quantitative approach. On the other hand, many studies on COVID-19 have been published within a short period of time. COVID-19 research heavily relies on insights from researchers or industry experts to anticipate the impacts of the pandemic because of the lack of reliable evidence and the constant changes in the severity of the disease, national and global policies, and people's perceptions and attitudes toward the pandemic. Moreover, COVID-19 studies utilized more diverse types of secondary data to understand the situation. This may be attributed to the development of analytical technologies for analyzing alternative data. More importantly, however, the use of alternative data and analytical skills was necessary to capture the rapidly evolving circumstances of COVID-19 in addition to conventional data (e.g., structured surveys or historical records of tourist arrivals).

COVID-19 has demonstrated more infectious than other epidemics, escalating the perceived risk of the disease. The scale of the COVID-19 pandemic has also been uniquely global and long-lasting, in contrast to previous epidemics, which were limited to certain cities or countries over relatively short periods of time. These differences were echoed in scholarship. Non-COVID-19 studies primarily examined how tourism and hospitality stakeholders, especially customers or tourists, perceived the diseases, how the perceptions developed into perceived risks, and how such perceptions influenced the performance of hospitality firms and tourism demands (Shi and Li, 2017; Yang and Chen, 2009). The nature of COVID-19 was reflected in a far more dynamic and diverse academic structure compared to previous studies of infectious diseases. The impact of COVID-19 has gone beyond industries and personal lifestyles to affect global communities. More importantly, collective efforts among various stakeholders, including governments, practitioners, and employees, were required to overcome the challenges posed by COVID-19.

This study also compared the differences in research topics emphasized by hospitality-oriented and tourism-oriented studies. Although the selected studies were unique in dealing with epidemics/pandemics, they tended to follow the mainstream research trends in each discipline. For instance, hospitality research focused on hospitality firm-related topics, such as human resource management, branding, and technology, while tourism research highlighted the impact of the pandemic on peoples' perceptions, communities, and the world. From a historical perspective, the hospitality industry has its roots in "hosting on a guest who departs from home and encompasses private, commercial, and noncommercial hospitality" (King, 1995), whereas recent hospitality research has taken a narrower perspective of hospitality, focusing on the commercial perspective (Brotherton, 1999). The majority of hospitality research follows economic and marketing standpoints (Ottenbacher et al., 2009), which was consistently shown in this study.

Tourism research depends on the multidisciplinary attributes of destinations (e.g., physical, cultural, and social) and tourists with various sociocultural backgrounds (Sharpley and Telfer, 2015). Hence, tourism research has long been interested in sustainable tourism that benefits not only tourism businesses, but also host communities and social value creation (Aquino et al., 2018). According to Merinero-Rodríguez and Pulido-Fernández (2016), some tourism research agendas address the issues in the particular community or destination, such as a "community approach" that considers a specific community and the resident populations in the process of tourism development planning, as well as a "stakeholders approach" that examines particular tourism policy and where plans can influence the industry stakeholders. As found in this study, research on pandemics mainly takes the community and stakeholder approaches, which is consistent with the majority of tourism research.

The contribution of the present study is the identification of the most researched areas in the tourism and hospitality literature. This study suggests future research directions on the theoretical bases of health-related research. Some of the research propositions serve as an underpinning for future studies on diseases and epidemics. While the diversity of study areas is increasing, sub-topics are also emerging on a more meaningful scale. The identified main topics can help researchers plan and conduct future studies. Moreover, comparisons of past pandemics with COVID-19 have emphasized the unique characteristics of COVID-19. Although they are significantly intertwined, the tourism and hospitality industries are distinct. This study compared the research topics for each industry to uncover the research areas or interests that aim to address issues in each industry. These findings will be helpful for researchers interested in the issues affected by the COVID-19 pandemic and the areas of research that are well established or understudied.

The current study has some limitations. The journal articles used in this research were restricted to English-language tourism and hospitality journals. Future studies could use articles published in other languages. They could also consider investigating databases using different scopes to collect more articles. This study also excluded books, book chapters, major conference proceedings, editorial, grey literature, industry reports, and theses/dissertations.

Acknowledgements

This work was supported by the Gachon University research fund of 2021 (GCU-202102830001).

References

Ahn, J., 2021. Impact of cognitive aspects of food mobile application on customers' behaviour. Curr. Issues Tour. https://doi.org/10.1080/13683500.2021.1890700.
Aquino, R.S., Lück, M., Schänzel, H.A., 2018. A conceptual framework of tourism social entrepreneurship for sustainable community development. J. Hosp. Tour. Manag. 37, 23–32.
Ateljevic, I., 2020. Transforming the (tourism) world for good and (re) generating the potential 'new normal'. Tour. Geogr. 22 (3), 467–475.
Bai, Y., Yao, L., Wei, T., Tian, F., Jin, D.-Y., Chen, L., Wang, M., 2020. Presumed asymptomatic carrier transmission of COVID-19. JAMA 323 (14), 1406.
Bloom, D.E., Cadarette, D., 2019. Infectious disease threats in the 21st century: strengthening the global response. Front. Immunol. 10, 549.
Brotherton, B., 1999. Towards a definitive view of the nature of hospitality and hospitality management. Int. J. Contemp. Hosp. Manag. 11 (4), 165–173.
Bulin, D., Tenie, I.P., 2020. Preliminary assessment of the COVID-19 pandemic impact on the tourism industry. Glob. Econ. Obs. 8 (1), 41–46.
Butler, R., 2020. Tourism–resilient but vulnerable as "the times they are a changing" in the "new normality". Worldw. Hosp. Tour. Themes 12 (6), 663–670.
Cha, S.S., 2020. Customers' intention to use robot-serviced restaurants in Korea: relationship of coolness and MCI factors. Int. J. Contemp. Hosp. Manag.
Chen, H., Eyoun, K., 2021. Do mindfulness and perceived organizational support work? Fear of COVID-19 on restaurant frontline employees' job insecurity and emotional exhaustion. Int. J. Hosp. Manag. 94, 102850.
Chen, M.-H., 2011. The response of hotel performance to international tourism development and crisis events. Int. J. Hosp. Manag. 30 (1), 200–212.
Chen, S., Law, R., Zhang, M., 2021. Review of research on tourism-related diseases. Asia Pac. J. Tour. Res. 26 (1), 44–58.
Chen, S.J., Waseem, D., Xia, Z.R., Tran, K.T., Li, Y., Yao, J., 2021. To disclose or to falsify: the effects of cognitive trust and affective trust on customer cooperation in contact tracing. Int. J. Hosp. Manag. 94, 102867.
Cheng, Y., Wei, W., Zhong, Y., Zhang, L., 2021. The empowering role of hospitable telemedicine experience in reducing isolation and anxiety: evidence from the COVID-19 pandemic. Int. J. Contemp. Hosp. Manag.

Cho, M., Bonn, M.A., Moon, S., Chang, H.S., 2020. Home chef meal kits: product attributes, perceived value and repurchasing intentions the moderating effects of household configuration. J. Hosp. Tour. Manag. 45, 192–202.

Choe, J.Y.J., Kim, J.J., Hwang, J., 2021. Perceived risks from drone food delivery services before and after COVID-19. Int. J. Contemp. Hosp. Manag.

Choe, Y., Wang, J., Song, H., 2020. The impact of the Middle East Respiratory Syndrome coronavirus on inbound tourism in South Korea toward sustainable tourism. J. Sustain. Tour.

Christou, P., Simillidou, A., Stylianou, M.C., 2020. Tourists' perceptions regarding the use of anthropomorphic robots in tourism and hospitality. Int. J. Contemp. Hosp. Manag.

Chua, B.-L., Al-Ansi, A., Lee, M.J., Han, H., 2020. Impact of health risk perception on avoidance of international travel in the wake of a pandemic. Curr. Issues Tour. 24 (7), 985–1002.

da Silva Lopes, H., Remoaldo, P.C., Ribeiro, V., Martín-Vide, J., 2021. Effects of the COVID-19 pandemic on tourist risk perceptions-the case study of Porto. Sustainability 13, 6399.

Davahli, M.R., Karwowski, W., Sonmez, S., Apostolopoulos, Y., 2020. The hospitality industry in the face of the COVID-19 pandemic: current topics and research methods. Int. J. Environ. Res. Health 17 (20), 7366.

Díaz-Sánchez, J.P., Obaco, M., 2020. The effects of Coronavirus (COVID-19) on expected tourism revenues for natural preservation. The case of the Galapagos Islands. J. Policy Res. Tour. Leis. Events 13 (2), 285–289.

Do, B., Nguyen, N., D'Souza, C., Bui, H.D., Nguyen, T.N.H., 2021. Strategic responses to COVID-19: The case of tour operators in Vietnam. Tour. Hosp. Res. https://doi.org/10.1177/1467358421993902.

Donohoe, H., Pennington-Gray, L., Omodior, O., 2015. Lyme disease: current issues, implications, and recommendations for tourism management. Tour. Manag. 46, 408–418.

Eltarabily, S., Elghezanwy, D., 2020. Post-pandemic cities-the impact of COVID-19 on cities and urban design. Archit. Res. 10 (3), 75–84.

Fan, Y.Y., Jamison, D.T., Summers, L.H., 2018. Pandemic risk: how large are the expected losses? Bull. World Health Organ 96 (2), 129–134.

Freidus, A.L., 2017. Unanticipated outcomes of voluntourism among Malawi's orphans. J. Sustain. Tour. 25 (9), 1306–1321.

Gössling, S., Scott, D., Hall, C.M., 2020. Pandemics, tourism and global change: A rapid assessment of COVID-19. J. Sustain. Tour. 1–20.

Guerreiro, J., Rita, P., Trigueiros, D., 2016. A text mining-based review of cause-related marketing literature. J. Bus. Ethics 139 (1), 111–128.

Hall, C.M., 2020. Biological invasion, biosecurity, tourism, and globalisation. In: Timothy, D. (Ed.), Handbook of Globalization and Tourism. Edward Elgar, pp. 114–125.

Hanrahan, J., Melly, D., 2019. Biosecurity risk and tourist communication in Ireland. Eur. J. Tour. Res. 22, 45–61.

He, J., Mao, Y., Morrison, A.M., Coca-Stefaniak, J.A., 2020. On being warm and friendly: the effect of socially responsible human resource management on employee fears of the threats of COVID-19. Int. J. Contemp. Hosp. Manag. https://doi.org/10.1108/IJCHM-04-2020-0300.

Higgins-Desbiolles, F., 2020. Socialising tourism for social and ecological justice after COVID-19. Tour. Geogr. 22 (3), 610–623.

Huang, A., Makridis, C., Baker, M., Medeiros, M., Guo, Z., 2020b. Understanding the impact of COVID-19 intervention policies on the hospitality labor market. Int. J. Hosp. Manag. 91, 102660.

Huang, X., Dai, S., Xu, H., 2020a. Predicting tourists' health risk preventative behaviour and travelling satisfaction in Tibet: combining the theory of planned behaviour and health relief model. Tour. Manag. Perspect. 33, 100589.

James Reilly, B., 2019. Northern European patterns of visiting Rome, 1400-1850. J. Tour. Hist. 11 (2), 101–123.

Jeon, C.-Y., Yang, H.-W., 2021. The structural changes of a local tourism network: Comparison of before and after COVID-19. Curr. Issues Tour. 24 (23), 3324–3338.

Jiménez-Barreto, J., Loureiro, S., Braun, E., Sthapit, E., Zenker, S., 2021. Use numbers not words! Communicating hotels' cleaning programs for COVID-19 from the brand perspective. Int. J. Hosp. Manag. 94, 102872.

Jung, H.S., Jung, Y.S., Yoon, H.H., 2021. COVID-19: The effects of job insecurity on the job engagement and turnover intent of deluxe hotel employees and the moderating role of generational characteristics. Int. J. Hosp. Manag. 92, 102703.

Karl, M., Muskat, B., Ritchie, B.W., 2020. Which travel risks are more salient for destination choice? An examination of the tourist's decision-making process. J. Dest. Mark. Manag. 18. https://doi.org/10.1016/j.jdmm.2020.100487.

Kaushal, V., Srivastava, S., 2021. Hospitality and tourism industry amid COVID-19 pandemic: perspectives on challenges and learnings from India. Int. J. Hosp. Manag. 92, 102707.

Kim, J., Kim, J., Lee, S.K., Tang, L.R., 2020. Effects of epidemic disease outbreaks on financial performance of restaurants: event study method approach. J. Hosp. Tour. Manag. 43, 32–41.

Kim, T.J., Almanza, B., Ma, J., Park, H., Kline, S.F., 2021. The cleanliness of restaurants: ATP tests (reality) vs consumers' perception. Int. J. Contemp. Hosp. Manag.

King, C.A., 1995. What is hospitality? Int. J. Hosp. Manag. 14 (3–4), 219–234.

Konarasinghe, K.M.U.B., 2020. Modeling COVID-19 epidemic of India and Brazil. J. N. Front. Healthc. Biol. Sci. 1 (1), 15–25.

Kuo, H.-I., Chen, C.-C., Tseng, W.-C., Ju, L.-F., Huang, B.-W., 2008. Assessing impacts of SARS and Avian Flu on international tourism demand to Asia. Tour. Manag 29 (5), 917–928.

Lau, A., 2020. New technologies used in COVID-19 for business survival: Insights from the Hotel Sector in China. Inf. Technol. Tour. 22 (4), 497–504.

Lee, C.K., Song, H.J., Bendle, L.J., Kim, M.-J., Han, H., 2012. The impact of non-pharmaceutical interventions for 2009 H1N1 influenza on travel intentions: a mode of goal-directed behavior. Tour. Manag. 33 (1), 89–99.

Lee, P.C., Xu, S.T., Yang, W., 2021. Is career adaptability a double-edged sword? the impact of work social support and career adaptability on turnover intentions during the COVID-19 pandemic. Int. J. Hosp. Manag. 94, 102875.

Lee, S.T., Kim, H.S., 2020. Nation branding in the COVID-19 era: South Korea's pandemic public diplomacy. Place Brand. Public Dipl. 1–15.

Liu-Lastres, B., Schroeder, A., Pennington-Gray, L., 2019. Cruise line customers' responses to risk and crisis communication messages: an application of the risk perception attitude framework. J. Travel Res 58 (5), 849–865.

Liu-Lastres, B., Mirehie, M., Cecil, A., 2021. Are female business travelers willing to travel during COVID-19? an exploratory study. J. Vacat. Mark. 1356766720987873.

Madera, J.M., Dawson, M., Guchait, P., Belarmino, A.M., 2017. Strategic human resources management research in hospitality and tourism: a review of current literature and suggestions for the future. Int. J. Contemp. Hosp. Manag. 29 (1), 48–67.

Mao, C.-K., Ding, C.G., Lee, H.-Y., 2010. Post-SARS tourist arrival recovery patterns: an analysis based on a catastrophe theory. Tour. Manag. 31 (6), 855–861.

Mao, Y., He, J., Morrison, A.M., Andres Coca-Stefaniak, J., 2021. Effects of tourism CSR on employee psychological capital in the COVID-19 crisis: from the perspective of conservation of resources theory. Curr. Issues Tour. 24 (19), 2716–2734.

McAleer, M., Huang, B.W., Kuo, H.I., Chen, C.C., Chang, C.L., 2010. An econometric analysis of SARS and Avian Flu on international tourist arrivals to Asia. Environ. Model. Softw. 25 (1), 100–106.

Mejia, C., Pittman, R., Beltramo, J.M., Horan, K., Grinley, A., Shoss, M.K., 2021. Stigma & dirty work: In-group and out-group perceptions of essential service workers during COVID-19. Int. J. Hosp. Manag. 93, 102772.

Merinero-Rodríguez, R., Pulido-Fernández, J.I., 2016. Analysing relationships in tourism: a review. Tour. Manag. 54, 122–135.

Mizrachi, I., Fuchs, G., 2016. Should we cancel? An examination of risk handling in travel social media before visiting ebola-free destinations. J. Hosp. Tour. Manag. 28, 59–65.

Moosa, I.A., Khatatbeh, I.N., 2021. International tourist arrivals as a determinant of the severity of COVID-19: International cross-sectional evidence. J. Policy Res. Tour., Leis. Events 13 (3), 419–434.

Moro, S., Cortez, P., Rita, P., 2015. Business intelligence in banking: a literature anaylsis from 2002 to 2013 using text mining and latent Dirichlet allocation. Expert Syst. Appl. 42 (3), 1314–1324.

Novelli, M., Burgess, L.G., Jones, A., Ritchie, B.W., 2018. 'No Ebola… still doomed'–The Ebola-induced tourism crisis. Ann. Tour. Res. 70, 76–87.

Ntounis, N., Parker, C., Skinner, H., Steadman, C., Warnaby, G., 2021. Tourism and Hospitality industry resilience during the Covid-19 pandemic: Evidence from England. Curr. Issues Tour. 1–14.

Oh, H., Kim, B.-Y., Shin, J.-H., 2004. Hospitality and tourism marketing: recent developments in research and future directions. Int. J. Hosp. Manag. 23 (5), 425–447.

Oliveira, A., Maia, M., Fonseca, M., Moraes, M., 2021. Customer preferences and self-service technologies: hospitality in the pandemic context. Anatolia 32 (1), 165–167.

Ottenbacher, M., Harrington, R., Parsa, H., 2009. Defining the hospitality discipline: a discussion of pedagogical and research implications. J. Hosp. Tour. Res. 33 (3), 263–283.

Page, S., Song, H., Wu, D.C., 2012. Assessing the impacts of the global economic crisis and swine flu on inbound tourism demand in the United Kingdom. J. Travel Res. 51 (2), 142–153.

Park, E., Chae, B., Kwon, J., 2018. Toward understanding the topical structure of hospitality literature: applying machine learning and traditional statistics. Int. J. Contemp. Hosp. Manag. 30 (11), 3386–3411.

Park, E., Kim, W.-H., Kim, S.-B., 2020. Tracking tourism and hospitality employees' real-time perceptions and emotions in an online community during the COVID-19 pandemic. Curr. Issues Tour. 1–5.

Perić, G., Dramićanin, S., Conić, M., 2021. The impact of Serbian tourists' risk perception on their travel intentions during the COVID-19 pandemic. Eur. J. Tour. Res. 27, 2705. -2705.

Pillai, S.G., Haldorai, K., Seo, W.S., Kim, W.G., 2021. COVID-19 and hospitality 5.0: redefining hospitality operations. Int. J. Hosp. Manag. 94, 102869.

Prayag, G., 2020. Time for reset? COVID-19 and tourism resilience. Tour. Rev. Int. 24 (2–3), 179–184.

Promsivapallop, P., Kannaovakun, P., 2017. A comparative assessment of destination image, travel risk perceptions and travel intention by young travellers across three ASEAN countries: a study of German students. Asia Pac. J. Tour. Res. 22 (6), 634–650.

Quintal, V., Sung, B., Lee, S., 2021. Is the coast clear? Trust, risk-reducing behaviours and anxiety toward cruise travel in the wake of COVID-19. Curr. Issues Tour. https://doi.org/10.1080/13683500.2021.1880377.

Rittichainuwat, B.N., Chakraborty, G., 2009. Perceived travel risks regarding terrorism and disease: The case of Thailand. Tour. Manag. 30 (3), 410–418.

Rossolatos, G., 2020a. A brand storytelling approach to Covid-19's terrorealization: cartographing the narrative space of a global pandemic. J. Dest. Mark. Manag. 18, 100484.

Rossolatos, G., 2020b. So near, so far, so what is social distancing? a fundamental ontological account of a mobile place brand. Place Brand. Public Dipl. 1–11.

Sánchez-Cañizares, S.M., Cabeza-Ramírez, L.J., Muñoz-Fernández, G., Fuentes-García, F. J., 2021. Impact of the perceived risk from Covid-19 on intention to travel. Curr. Issues Tour. 24 (7), 970–984.

Şengel, Ü., Çevrimkaya, M., Genç, G., Işkın, M., Zengin, B., Sarıışık, M., 2020. An assessment on the news about the tourism industry during the COVID-19 pandemic. J. Hosp. Tour. Insights. https://doi.org/10.1108/JHTI-05-2020-0072.

Seyitoğlu, F., Ivanov, S., 2020. A conceptual framework of the service delivery system design for hospitality firms in the (post-) viral world: the role of service robots. Int. J. Hosp. Manag. 91, 102661.

Sharma, G.D., Thomas, A., Paul, J., 2021. Reviving tourism industry post-COVID-19: a resilence-based framework. Tour. Manag. Perspect. 37, 100786.

Sharpley, R., Telfer, D.J., 2015. Tourism and Development: Concepts and Issues. Channel view publications,.

Shi, W., Li, K.X., 2017. Impact of unexpected events on inbound tourism demand modeling: evidence of Middle East Respiratory Syndrome outbreak in South Korea. Asia Pac. J. Tour. Res. 22 (3), 344–356.

Smith, R.D., Keogh-Brown, M.R., Barnett, T., 2011. Estimating the economic impact of pandemic influenza: an application of the computable general equilibrium model to the UK. Soc. Sci. Med. 73 (2), 235–244.

Sobaih, A.E.E., Elshaer, I., Hasanein, A.M., Abdelaziz, A.S., 2021. Responses to COVID-19: the role of performance in the relationship between small hospitality enterprises' resilience and sustainable tourism development. Int. J. Hosp. Manag. 94, 102824.

Tang, C.F., Lau, E., 2017. Modelling the demand for inbound medical tourism: the case of Malaysia. Int. J. Tour. Res. 19 (5), 584–593.

Tew, P.J., Lu, Z., Tolomiczenko, G., Gellatly, J., 2008. Sars: Lessons in Strategic Planning for Hoteliers and Destination Marketers. In: Int. J. Contemp. Hosp. Manag, 20, pp. 332–346.

Traskevich, A., Fontanari, M., 2021. Tourism potentials in Post-COVID19: the concept of destination resilience for advanced sustainable management in tourism. Tour. Plan. Dev. 1–25.

Utkarsh, Sigala, M., 2021. A bibliometric review of research on COVID-19 and tourism: reflections for moving forward. Tour. Manag. Perspect. 40, 100912.

Vo-Thanh, T., Vu, T.-V., Nguyen, N.P., Nguyen, D.V., Zaman, M., Chi, H., 2020. How does hotel employees' satisfaction with the organization's COVID-19 responses affect job insecurity and job performance? J. Sustain. Tour. 29 (6), 907–925.

Wallach, H.M., Murray, I., Salakhutdinov, R., Mimno, D., 2009. *Evaluation methods for topic models.* Paper presented at the Proceedings of the 26th annual international conference on machine learning.

Wang, Y.-S., 2009. The impact of crisis events and macroeconomic activity on Taiwan's international inbound tourism demand. Tour. Manag 30 (1), 75–82.

Wen, J., Kozak, M., Yang, S., Liu, F., 2020. COVID-19: potential effects on Chinese citizens' lifestyle and travel. Tour. Rev.

Wu, E.H., Law, R., Jiang, B., 2010. The impact of infectious diseases on hotel occupancy rate based on independent component analysis. Int. J. Hosp. Manag. 29 (4), 751–753.

Wut, T.M., Xu, J., Wong, S.-M., 2021. Crisis management research (1985-2020) in the hospitality and tourism industry: a review and research agenda. Tour. Manag 85, 104307.

Xie, C., Zhang, J., Morrison, A.M., Coca-Stefaniak, J.A., 2021. The effects of risk message frames on post-pandemic travel intentions: the moderation of empathy and perceived waiting time. Curr. Issues Tour. https://doi.org/10.1080/13683500.2021.1881052.

Yang, F.X., Wong, I.A., 2020. The social crisis aftermath: tourist well-being during the COVID-19 outbreak. J. Sustain. Tour. 29 (6), 859–878.

Yang, H.Y., Chen, K.H., 2009. General equilibrium analysis of the economic impact of a tourism crisis: a case study of the SARS epidemic in Taiwan. J. Policy Res. Tour. 1 (1), 37–60.

Yang, M., Han, C., 2021. Revealing industry challenge and business response to Covid-19: a text mining approach. Int. J. Contemp. Hosp. Manag. https://doi.org/10.1108/IJCHM-08-2020-0920.

Yang, Y., Liu, H., Chen, X., 2020. COVID-19 and restaurant demand: early effects of the pandemic and stay-at-home orders. Int. J. Contemp. Hosp. Manag.

Yang, Y., Zhang, C.X., Rickly, J.M., 2021. A review of early COVID-19 research in tourism: launching the Annals of Tourism Research's curated collection on coronavirus and tourism. Ann. Tour. Res. 91, 103313.

Yoo, M., Lee, S., Bai, B., 2011. Hospitality marketing research from 2000 to 2009: topics, methods, and trends. Int. J. Contemp. Hosp. Manag. 23 (4), 517–532.

Yu, H., Lee, L., Popa, I., Madera, J.M., 2021b. Should I leave this industry? The role of stress and negative emotions in response to an industry negative work event. Int. J. Hosp. Manag. 94, 102843.

Yu, J., Park, J., Hyun, S.S., 2021a. Impacts of the COVID-19 pandemic on employees' work stress, well-being, mental health, organizational citizenship behavior, and employee-customer identification. J. Hosp. Mark. Manag. 1–20.

Yu, M., Li, Z., Yu, Z., He, J., Zhou, J., 2020. Communication related health crisis on social media: a case of COVID-19 outbreak. Curr. Issues Tour. https://doi.org/10.1080/13683500.2020.1752632.

Yuan, Y.Y., Tseng, Y.-H., Chang, C.-Y., 2014. Tourism subfield identification via journal clustering. Ann. Tour. Res. 47, 77–95.

Yung, R., Khoo-Lattimore, C., 2019. New realities: a systematic literature review on virtual reality and augmented reality in tourism research. Curr. Issues Tour. 22 (17), 2056–2081.

Yung, R., Khoo-Lattimore, C., Potter, L.E., 2021. Virtual reality and tourism marketing: conceptualizing a framework on presence, emotion, and intention. Curr. Issues Tour. 24 (11), 1505–1525.

Zeng, B., Carter, R.W., De Lacy, T., 2005. Short-term perturbations and tourism effects: the case of SARS in China. Curr. Issues Tour. 8 (4), 306–322.

Zenker, S., Kock, F., 2020. The coronavirus pandemic – a critical discussion of a tourism research agenda. Tour. Manag 81, 104164.

Zheng, D., Luo, Q., Ritchie, B.W., 2021. Afraid to travel after COVID-19? Self-protection, coping and resilience against pandemic 'travel fear'. Tour. Manag. 83, 104261.

Zopiatis, A., Pericleous, K., Theofanous, Y., 2021. COVID-19 and hospitality and tourism research: an integrative review. J. Hosp. Tour. Manag. 48, 275–279.