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Tourism research after the COVID-19 outbreak: Insights for more sustainable, local and smart cities

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ABSTRACT

This paper presents the results of a bibliometric analysis of academic research dealing with COVID-19 in the area of city destination development from 1 December 2019 to 31 March 2021. Particularly, by means of SciMAT software, it identifies, quantifies, and visually displays the main research clusters, thematic structure and emerging trends that city and tourism planners will face in the new normal. The search revealed that social media and smart tourism are the themes with the greatest potential; sustainable cities, local destination development, changes in tourist behavior, and tourists' risk perception are underdeveloped streams with enormous relevance and growth in the new normal. Research on the effects of COVID-19 on citizen health and its economic impact on the tourism industry and cities are intersectional and highly developed topics, although of little relevance. The current study also identifies the challenges of destination research for planners and proposes future research directions. Consequently, this paper contributes to the existing literature on COVID-19 and sustainable cities, as it develops a critical examination of the extant research and points out the research gaps that must be filled by future studies.

1. Introduction

The COVID-19 pandemic that emerged in December 2019 has affected the health, biomedical, environmental, and tourism sectors, among others. Hospitality and tourism are productive sectors that have been acutely affected by the outbreak. Local and regional COVID-19 lockdowns, coupled with international travel restrictions, have affected international and domestic hospitality as well as day visits, damaging sectors including public and air transport, restaurants, hotels, accommodations, festivals, and sports events (Hao, Xiao & Chon, 2020). Secondary sectors such as catering, laundry, and fuels have also suffered drastically (Gössling, Scott & Hall, 2020). For example, the US restaurant industry, by 15 July, saw about 7 million layoffs and the complete closure of 60% of restaurants. The shutdown of nearly 16,000 of these businesses became permanent by 24 July (Croft, Jay, 2020). Airports were expected to suffer a total of USD 76.6 billion of losses in 2020 (Garcia, 2020). As a whole, according to a study by EMSI (Jay, 2020), for every day that the US hospitality sector is shut down, it loses 12,000 jobs and more than USD 534 million in revenue.

In order to establish future solutions for the recovery of the sector, scholars are publishing a great deal of articles every day. Specifically, city development scholars are evaluating the consequences for the tourism industry and investigating the consequences for citizen purchasing behavior after COVID-19. In order to synthesize this unprecedented amount of articles, scholars are using systematic reviews and bibliometric studies aiming to synthesize results in the biomedical, political, economic, and health fields, among others (Casado-Aranda, Viedma-del-Jesús, & Sánchez-Fernández, 2020). Although some avenues in city and tourism research have been discussed (Zenker & Kock, 2020), the relevance of multidisciplinary studies on COVID-19 in tourism has been assessed (Wen, Wang, Kozak, Liu & Hou, 2020), the human mobility behavior in COVID-19 has been cleared up (Benita, 2021), and the impacts and implications of resetting research and international sectors have been specified (Farzanegan, Gholipour, Feizi, Nunkoo & Andargoli, 2020; Sigala, 2020; Škare et al., 2020), no systematic review has assessed the unforeseen growth of COVID-19 articles in the area of city development and tourism and identified the main research clusters and challenges that the tourism industry and academia will face in the future. This approach could shed light on the current scope, features, and topics of interest relating to COVID-19 and tourism.

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More importantly, a systematic review of the publications on COVID-19 and tourism would make it possible to reveal the typologies of tourism, the forms of its management, and expected changes in tourist behavior, which will gain comparatively more importance at the global level in the so-called new normal.

Considering the above-mentioned research gap, the current analysis was aimed at developing a systematic review in order to answer the following research questions:

RQ1: What was the growth in publications on COVID-19, city development, and tourism indexed in the Web of Science (WoS) and Scopus databases between 1 December 2019 and 31 March 2021?

RQ2: What are the main journals, authors, and publications worth considering in future studies on tourism and COVID-19?

RQ3: Which are the key emerging topics and subthemes of research on tourism after the COVID-19 outbreak?

RQ4: What is the role of sustainable tourism, local development and its management, and new tourist behavior in the new normal after COVID-19?

Overall, RQ1 and RQ2 are important to academics who wish to publish papers and understand the city and tourism literature after the COVID-19 pandemic. RQ3 aims to provide insightful novel contributions regarding the identification of research clusters by means of co-citation analysis. RQ4 discusses future avenues of city development and tourism theory and practice after COVID-19. All in all, this research contributes to the existing literature on COVID-19 and sustainable and smart cities as it conducts a critical analysis of the extant research and points out the research gaps that must be filled by future studies. The following section explains the specific search strategy of the systematic review, lists the requirements for inclusion and exclusion of articles, describes the phases of bibliometric analysis and the software used, and lists the range of years analyzed.

2. General framework: COVID-19 and a call for more sustainable, smart, and local cities

Before the pandemic began, the literature on the development of cities as social, cultural, and professional centers was already commenting on a dramatic rise of so-called smart cities, that is, cities that implement helpful strategies for citizen accessibility and wellness, and provide clear support for environmental, digital, and e-governmental decisions. A study by Bastidas-Manzano et al. (2020), for example, performed a comprehensive review of 258 investigations published between 2013 and 2019 on the topic of smart and sustainable cities. Their results confirmed the following:

(i) Although there is not yet a clear definition of what a smart city is, such a concept constitutes a motor topic with high potential for development and influence on the rise of technology, sustainability, and accessibility in traditional cities.

(ii) Given the strong impact of tourism on cities and territories (Femenia-Serra et al., F. V., 2019), it is imperative to analyze the relationship of tourism with the development of smart cities, combined under the concept of smart tourism, which is currently booming in the framework of a greater dependence on information and communication technologies, as it allows vast amounts of data in the tourism sector to be transformed into value for citizens and consumers.

(iii) Tools such as big data, the Internet of Things, and smart devices constitute intelligent platforms in which each object is connected to a network, linking the physical and digital world and facilitating more responsible, efficient, and healthier lifestyles.

(iv) Sustainability has acquired greater importance, as it constitutes a key piece of today's cities by making the lives of residents easier and offering sustainable and responsible management of natural resources.

The advent of COVID-19 has accelerated all processes aimed at reducing contact and making communication, transport, and policies more efficient. Already in an initial study, Sigala (2020) evidenced the need for a collective effort and understanding of the new challenges after COVID-19, aiming to advance and reset the industry and research on tourism and city development. The current research aims to identify this research gap and, through a bibliometric analysis and critical discussion, advance the understanding and clarification of future research challenges in sustainable, smart cities and the influence of tourism.

3. Materials and methods: a bibliometric study

The current study carried out consultations on 31 March 2021 on the WoS and Scopus databases. The query consultation in the WoS included keywords associated with COVID-19: "COVID-19″ OR "Covid-19″ OR "2019-nCoV" OR "SARS-CoV-2″ OR "coronavirus" OR "corona virus". In particular, we filter in the WoS categories of: Hospitality Leisure Sport Tourism, Economics, Management and Urban Studies, Environmental Studies or Business. In Scopus, the consulted added the previous keywords together with "tourism" OR "hospitality". We were interested in the titles, abstracts and keywords of articles and reviews written in English.

The starting search revealed over 1514 articles in English, 211 of which were duplicates and eliminated from further analysis. We then obtained 1303 papers published between 1 December 2019 and 31 March 2021. In the analysis, we used the SciMAT tool (Cobo, López-Herrera, Herrera-Viedma & Herrera, 2011), which constitutes a methodology useful for exploring the theoretical background of a given branch. Considering the output derived from the previous queries, the SciMAT software (i) classified the 1303 manuscripts by publication date, citations, and journal titles and (ii) implemented a co-word search to clarify the most impactful topics associated with COVID-19 and tourism (Cobo et al., 2012). A co-word analysis constitutes a content analysis tool that makes use of patterns of co-occurrence of several items (such as words or nouns) within a collection of manuscripts aiming to recognize the links between ideas within the subject topics included in the corpus of texts. In our case, the co-word phase used text-mining tools for the titles, abstracts, and keywords, leading to the development of a strategic diagram highlighting the relative relevance of the topics associated with the tourism sector after the COVID-19 outbreak. This strategic diagram represents a graph implemented with the SciMAT software that highlights major topics based on their density and centrality. Density constitutes a measure of theme development, and centrality highlights the relevance of a theme. The union of low and high intensities of density and centrality facilitates the establishment of four quadrants: driving themes (strong centrality and high density), highly isolated topics (low centrality and high density), emerging issues (low centrality and density), and basic topics (high centrality and low density). (Cobo et al., 2011).

During the co-word step, we used the main default values detailed by Cobo et al. (2011). Particularly, we first selected the author's words and the source's words and added words as units of analyses. Afterwards, we used a minimum frequency of two words from a co-occurrence matrix aiming to calculate the similarities between the selected items. We then made use of an equivalence index as a normalization measure. Likewise, we followed the Simple Center Algorithm, with a maximum network size of 4 and a minimum of 1. The purpose of such a phase was to clarify the most relevant networks. Finally, we used the "number of documents" and the "number of citations" as a quality measure of the strategic diagram.

4. Results

4.1. Scientific performance

The results of the bibliometric analysis as extracted by the SciMAT tool (Cobo et al., 2011) revealed a corpus of 1303 peer-reviewed publications linking the pandemic with tourism. We identified 89% through Scopus and 11% through WoS. It is worth noting that 59% of the WoS and 64% of the Scopus publications are open access.

The effects of the COVID-19 crisis on the hospitality and tourism industries are evidenced in hospitality outlets such as *International Journal of Hospitality Management* and *International Journal of Contemporary Hospitality Management*. Many articles appear in tourism and sustainable publications such as *Tourism Geographies, Annals of Tourism Research*, and *Journal of Sustainable Tourism* (Table 1). The academics with the largest contributions on this matter are primarily from Canadian, Australian, and Chinese universities (Table 2). Some of them are especially relevant for a large number of manuscripts: Vanessa Ratten (La Trobe University), Jenny Kim (Youngsan University), and Jianping Li (Chinese Academy of Sciences). Table 3 shows the 10 most highly cited articles within the obtained sample.

4.2. Content analysis

The content analysis of the keywords used with SciMAT revealed nine main themes: tourism, social media, public health, economic impact, smart cities/tourism, COVID-19, risk perception, sustainable tourism, and consumer behavior. The strategic diagram shown inFig. 2 highlights the combination of topics on COVID-19 and tourism based on density and centrality criteria. The number of papers including each keyword is proportional to the volume of each sphere. This content analysis was also aimed at shedding light on the link between the keywords and the most recurrent subtopics by means of so-called thematic networks; specifically, "the size of the spheres for a thematic network is proportional to the number of articles corresponding to each keyword, whereas the width of the link between two spheres i and j is proportional to the e_{ij} equivalence index" (Author1 et al., Casado-Aranda, Viedma--del-Jesús, & Sánchez-Fernández, 2020). The following section describes the strategic diagram and the main thematic networks derived from the content analysis.

Data analysis shows that most COVID-19-related tourism publications suggested that the themes with greatest potential (motor themes) in the selected period were social media and smart tourism. This reflects that tourism research during the COVID-19 era has prioritized new forms of tourism that use technology, accessibility, and sustainability as fundamental axes (i.e., smart tourism), as well as accelerated digitalization and social media in the provision of tourism services after the COVID-19 outbreak. Fig. 3 shows that two of the themes associated with the smart tourism and social media axis are mobility and hotels, reflecting interest in the use of technology and accessible spaces to monitor tourist mobility and evaluate its influence on hotel performance.

Sustainable tourism, consumer behavior, and risk perception constitute emerging topics that, although not widely developed, may be relevant axes with potential for future analysis. Research specifically exploring changes in consumer and tourist behavior turned out to be the least developed. As a whole, these major themes highlight the forms and elements of tourism that are gaining prominent interest in the new normal after COVID-19 (Fig. 4). The thematic networks reflect new trends and topics in consumer behavior in the new era, such as prosumer, the use of online payment methods, and changes in lifestyle and travel. In addition, risk perception is becoming a topic of growing interest for the recovery of the tourism sector in general, and the airline industry in particular (Fig. 5).

The major themes of tourism and public health are have acquired significant relevance in the period under analysis but are intersectional with all research on tourism, hospitality, and COVID-19. The upper left sector of Fig. 2 refers to the economic impact of COVID-19, which encompasses highly developed themes. Specifically, research has analyzed how public policies, hospitality and tourism company strategies, and periods of lockdown have socially and economically affected the performance of the tourism sector globally (Fig. 6).

Table 1
Outlets with greatest amount of research on COVID-19 and hospitality and tourism from 1 December 2019 to 31 March 2021.

Journal	Number of publications
Sustainability	180
International Journal of Hospitality Management	63
Annals of Tourism Research	38
Journal of Sustainable Tourism	33
Tourism Geographies	28
Current Issues in Tourism	21
International Journal of Contemporary Hospitality Management	21
Journal of Retailing and Consumer Services	16
Anatolia	15
Journal of Transport Management	15

5. Rebuilding the future of cities and tourism development: knowledge domains and challenges after the COVID-19 outbreak

Once the main thematic axes and networks were clarified, we further conducted a comprehensive empirical review of the selected studies, aiming to classify the main thematic axes established above into tourism research domains. We know from the literature on business management, and tourism in particular, that business performance is influenced by macro- and microenvironmental factors. The macroenvironment includes forces external to the company of a health, social, economic, or political nature that affect tourism management and performance. The microenvironment, on the other hand, incorporates all stakeholders with which the company does business (e.g., suppliers, investors, or governments, among others), one of the most important of which is tourists (Hassan, 2000). Studies in tourism management, in fact, have largely shown that tourism strategies depend, to a large extent, on macroenvironmental factors (such as COVID-19, government policies, or social movements) and microenvironmental factors (such as tourist behavior) (Polo-Peña et al., 2012). Authors such as Duvenage (2016), Mhlanga (2019), and Wang and Ap (2013) conclude that identifying the micro- and macroenvironmental factors that affect tourism management could be a starting point for unlocking the industry's challenges.

Along this line, this paper next examines how COVID-19 (as a macroenvironmental factor) has affected other macroenvironmental forces (such as economics, social movements, and tourism-related lifestyles) and microenvironmental forces (such as modifications in tourist behavior), and the effects of these two major forces on changes in tourism management after the COVID-19 outbreak (Fig. 7).

5.1. Macro-factors: effects of COVID-19 on tourism development: economy, travel, prices, and workforce

The first knowledge domain of the COVID-19 literature evaluates the economic and social impact, in figures, of COVID-19 in sectors involved in tourism, e.g., cruise ships, events, bookings, and hotels. In a similar vein, recent research has also assessed how companies, intermediaries, and sales forces have adapted to the new reality of COVID-19.

5.1.1. Economic consequences of COVID-19

Recent research in the tourism field has assessed the impact of COVID-19 restrictions on firm performance. For example, Williams (2020) concluded that COVID-19 impacted 81% of the worldwide tourism workforce. The World Tourism Organization in 2019 predicted a 4% increase in international arrivals by 2020; after the COVID-19 outbreak, it changed its prediction to a 30% reduction in worldwide arrivals in 2020, which translates to a loss of USD 300–450 billion in the worldwide tourism sector. The US restaurant industry, for example, saw about 7 million layoffs and a complete closure of 60% of its restaurants by 15 July. The shutdown of nearly 16,000 of these businesses became permanent by 24 July (Croft, Jay, 2020; The Seattle Times, 2020). Airports predicted losses of USD 76.6 billion in 2020 (Garcia, 2020). Furthermore, Ludvigsen and Hayton (2020) stated that because of

Table 2
Authors with the greatest number of publications on COVID-19 and tourism.

Author	Affiliation and Country	Main researchtopics	Articles	ArticlesFractionalized [a]
Vanessa Ratten	La Trobe University, Melbourne (Australia)	This author's main research conclusions are related to the impact of the experiences on affects during the COVID-19 pandemic quarantine; the future of small business entrepreneurship based on COVID-19 change; and digital transformation from COVID-19	11	7.70
Jenny Kim	School of Hotel and Tourism Management, Youngsan University (South Korea)	The contributions are involved with customer post-purchase behavior after COVID-19; emotional labor; employee wellbeing during the COVID-19; and individual differences and job characteristics in hospitality work outcomes after the COVID-19 pandemic	10	3.29
Jianping Li	Institutes of Science and Development, Chinese Academy of Sciences, Beijing (China)	This author has emphasized the need for a more global social and economic collaboration to effectively combat COVID-19 from different perspectives	9	2.65
Jun Wen	School of Business and Law, Edith Cowan University, Joondalup (Australia)	This author has focused the efforts on evaluating the mental health consequences of COVID-19 media coverage; exploring the missing link between medical science knowledge and public awareness; and proposing public health lessons from crisis-related travel	8	2.93
Heesup Han	College of Hospitality and Tourism Management, Sejong University, Seoul (Korea)	The main topics focus on evaluating the COVID-19 moderator role in the impact of hotel attributes, well-being perception, and attitudes on brand loyalty, as well as the tourists' outbound travel behavior in the aftermath of the COVID-19	7	1.56
Rob Law	Hospitality and Tourism Research centre (HTRC), School of Hotel and Tourism Management, Hong Kong Polytechnic University (China)	His-research efforts have been made on revealing the impact of COVID-19 on hospitality and tourism education	7	1.62
Xinyi Liu	College of Tourism, Sichuan University, Wangjiang Road, Chengdu (China)	This author has given insights into the importance of interdisciplinary studies on COVID-19 in and beyond tourism, and has proposed alternative paths to rethink game consumption in tourism after the COVID-19 pandemic	7	1.67
Michael Hall	University of Canterbury, Department of Service Management and Service Studies (Sweden)	The economic, geopolitics and healthcare effects of COVID-19 have been analyzed by this author	6	1.87
Andres Coca-Stefaniak	Business School, Department of Marketing, Events and Tourism, University of Greenwich, London (UK)	His-research conclusions are related to the effects of risk message frames on post-pandemic travel intentions; the development of a risk perception scale for travel to a crisis epicenter; and the effects of hotel safety leadership on employee safety behavior during COVID-19	5	1.32
James Crick	University of Ottawa, Telfer School of Management, Ontario (Canada)	This author has focused on analyzing the collaborative business-to-business marketing strategies in a pandemic crisis	5	3.50

[a] Fractions refer to frequency distribution of affiliations (of all co-authors for each paper).

COVID-19, national institutions banned collective events, which strongly damaged that industry. Flew and Kirkwood (2020) evaluated how COVID-19 has impacted art, culture, and communication in Australia and concluded that less than half of arts and recreation firms were active in early March 2020. These results show that this industry was most strongly affected by COVID-19. Sharma and Nicolau (2020), along the same line, concluded that airlines, hotels, car rentals, and cruise lines reduced their valuation, which should cause concern about their long-term outlook, especially the cruise industry.

5.1.2. *Demand and price for tourist and hospitality services*

Other research has gone deeper into the effects of COVID-19 on the demand for tourist and city services and on price fluctuations. Gallego and Font (2020), using Skyscanner data on air tourist searches between November 2018 and December 2020, developed a tool for tourist firms aiming to reduce the impacts of the pandemic. The findings show that travel was reduced by 30% in Europe and 50% in Asia. In addition, travel intentions were reduced by about 10–20%. Uğur and Akbıyık (2020) presented the reactions of travelers on TripAdvisor forums during the COVID-19 pandemic and revealed that the crisis greatly affected the tourism sector as soon as news of the pandemic was disseminated, with increased travel cancellations and delays. Similarly, Dubois (2020) reported a 96% reduction in Airbnb bookings. Foo, Chin, Tan and Phuah (2020) and Mariolis, Rodousakis and Soklis (2020) analyzed the consequences of COVID-19 on the hospitality and tourism sectors in Malaysia and Greece, respectively. Mariolis et al. (2020) confirmed that the losses in the tourism sector led to a reduction in GDP of about 6%. Liew (2020) assessed the effects of the pandemic on tourism share prices, which benefit from packaged-tour business services and online hotel reservations, and revealed a dramatic drop in tourism sector outcomes amid COVID-19. In a similar vein, Shakibaei et al. (M., 2021) assessed the impact of the pandemic on travel behavior in Istanbul. Their findings revealed not only a crucial reduction in travel demand for commuting, leisure, and shopping trips, but also a shift to teleworking and increased importance of hygiene and comfort on public transportation.

5.1.3. *Governments and aid to the tourism sector*

The COVID-19 pandemic has also affected the workforce of the tourism industry. Huang, Makridis, Baker, Medeiros and Guo (2020), for example, concluded that company closures were related to a 30% drop in non-salaried workers in the hospitality sector from March to April 2020. Williams (2020) stated that governments worldwide offered a great amount of financial support to the companies and employees affected, with offers up to USD 2500 per employee in the United Kingdom. COVID-19 and periods of lockdown caused a drastic reduction in the ability of small- and medium-sized enterprises in the tourism sector to hire more staff, offer job security, or improve working conditions, as shown by Baum, Mooney, Robinson and Solnet (2020). Large hotel companies, however, are better positioned to recover economically and financially and should therefore be pioneers in developing policies and strategies for the stabilization of tourism and hotel personnel.

Table 3
Top 10 publications by number of citations on COVID-19 and tourism.

Author, Publication	DOI	Main findings	Total Citations
Gössling, 2020, *Journal of Sustainable Tourism*	10.1080/09,669,582.2020.1758708	This manuscript argues that the COVID-19 outbreak is analogue to the ongoing climate crisis, and gives reasons to show that there is a need to question the volume of growth tourism model advocated by international tourism organizations	231
Hall, 2020, *Tourism Geographies*	10.1080/14,616,688.2020.1759131	This research concludes that the nature of the impact of COVID-19 and the measures to contain it will lead to reorientation towards a smart and sustainable tourism in some cases, but in others will contribute to policies reflecting the selfish nationalism of some countries	58
Higgins-Desbiolles, 2020, *Tourism Geographies*	10.1080/14,616,688.2020.1757748	According to these authors, the COVID-19 crisis provides a unique opportunity to reset the tourism sector, not only by focusing on a more responsible approach but also on the rights and interests of local communities and local peoples	55
Sigala, 2020, Journal of Business Research	10.1016/j.jbusres.2020.06.015	This manuscript comments on the major incidence, behaviors and experiences that tourism stakeholders such as tourism demand, supply and destination management organizations and policy makers are experiencing during the recovery and reset of COVID-19.	50
Yang, 2020, *Annals of Tourism Research*	10.1016/j.annals.2020.102913	In this research note, the authors propose a general equilibrium model to explore the effect of the COVID-19 outbreak on tourism. This generalizable model supports the policy of providing tourism consumption vouchers for residents.	43
He, 2020, *Journal of Business Research*	10.1016/j.jbusres.2020.05.030	This article confirms that the COVID-19 offers a great opportunity for businesses to shift towards more genuine and authentic corporate social responsibility and contribute to address urgent global social, environmental and ethical consumption challenges	42
Wen, 2020, *Tourism Review*	10.1108/TR-03–2020–0110	This paper forecasts that COVID-19 will likely affect Chinese travelers' patterns, such as the growing popularity of free and independent travel, luxury trips, slow tourism, smart tourism and health and wellness tourism.	36
Shehzadi, 2020, *Asian Educational Development Studies*	10.1108/AEDS-04–2020–0063	This study confirms that Information and Communication Technologies, e-service quality and e-information quality are positively contributed toward students' e-learning during the COVID-19 pandemic which ultimately leads to create positive e-word of mouth and students' satisfaction.	36
La, 2020, *Sustainability*	10.3390/su12072931	Based on a timely communication on any developments of the outbreak from the government and the media, combined with up-to-date research on the COVID-19, this article gives insights into how Vietnam—despite being under-resourced—has demonstrated political readiness to combat the emerging pandemic since the earliest days.	35
Brouder, 2020, *Tourism Geographies*	10.1080/14,616,688.2020.1760928	This paper concludes that the COVID-19 provides an unique opportunity to rethink the future of the tourism sector, but that will only possible if sufficient institutional innovation occurs on both the demand and supply side of tourism that can foster the emergence of new paths	34

5.2. Micro-factors: effects of COVID-19 on tourist behavior

The COVID-19 outbreak and periods of lockdown modified not only the ways in which tourists (as the main element of the microenvironment) search for destination information, but also their preferences, attitudes, and behaviors during and after receiving tourist or hospitality services. Particularly, studies in the field of tourism have largely proposed six new pillars on which the new tourist behavior will be based in the new normal: sustainability; interest in local, technology, and smart cities; luxury services; hygiene protocols; and emotions.

5.2.1. Sustainability

Much of the research on sustainable cities and tourism has proposed that the future of cities and tourist development should take a sustainable approach. According to Higgins-Desbiolles (2020) and Buckley (2020), one of the main challenges in the industry after COVID-19 is having long-term, sustainable, and equitable development in the service of local societies. Environmental degradation, economic exploitation, and overcrowding of traditional tourism services must be replaced by care for the animals, nature, and local landscape of tourist destinations (Casado-Díaz, Sancho-Esper, Rodriguez-Sanchez & Sellers-Rubio, 2020; Crossley, 2020). Along the same line, Everingham and Chassagne (2020) proposed a future hospitality and tourism industry that offers environmental and social well-being. In alignment with this reasoning, He and Harris (2020) noted that COVID-19 offers an invaluable opportunity for

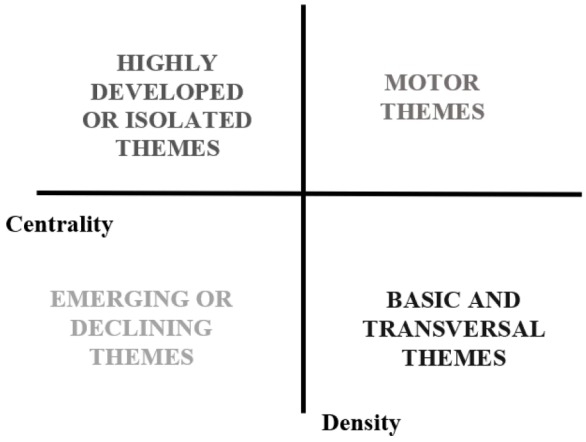

Fig. 1. Representation of a strategic diagram.

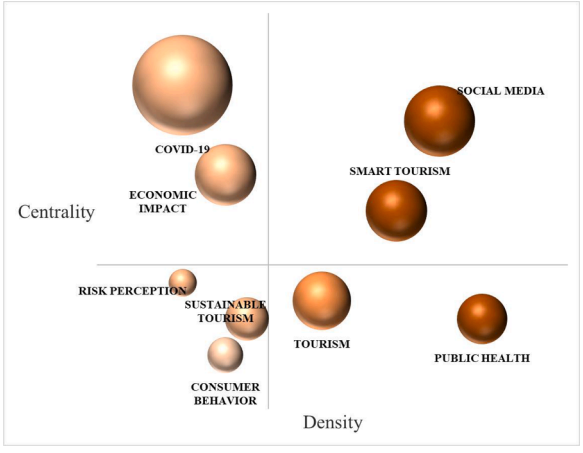

Fig. 2. Strategic diagram of the period December 2019 to March 2021 based on publications.

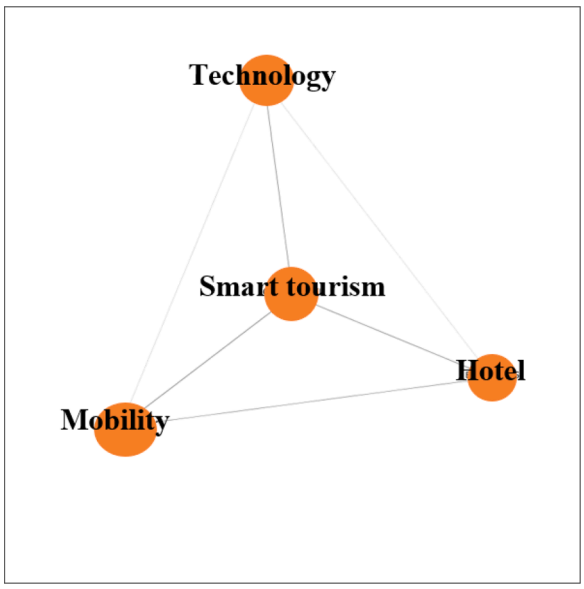

Fig. 3. Main thematic networks exploring effects of COVID-19 on tourism industry.

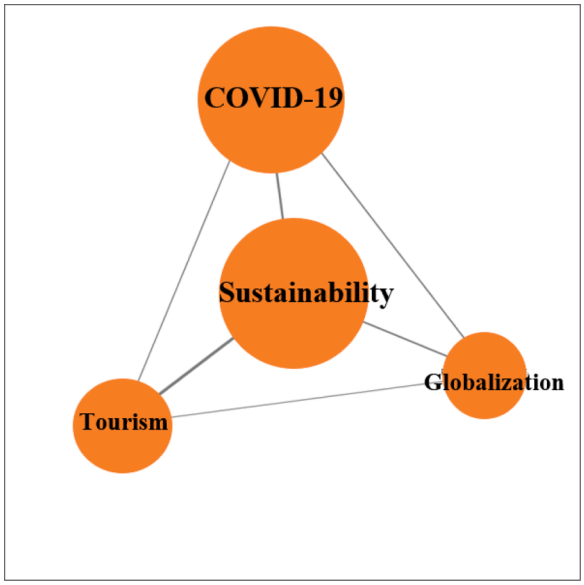

Fig. 4. Thematic networks evaluating interactions between COVID-19 and sustainability in the tourism industry.

firms to engage in more authentic corporate social responsibility and face international environmental and social challenges.

Following this research line, Wu (2021) recently highlighted the need to use system optimization algorithms based on artificial intelligence technologies to create greener hospitals in sustainable cities. Prideaux, Thompson and Pabel (2020) argued that using "flattening the curve" strategies learned through COVID-19 and adopting a circular economy model will help avert climate change and city noise. Chen and Zhang (2021) evaluated the driving factors of city sustainability based on interactions among multiple indicators and concluded that environmental indicators constitute the most significant drivers affecting city sustainability, thus are more greatly affected by the COVID-19 pandemic. Authors such as Agarwal et al. (2021), Kumar et al. (2020), and Wang and Li (2021) noted indoor and outdoor quality improvement during and after the pandemic. Similar conclusions were highlighted by Rumpler, Venkataraman and Göransson (2020) and Basu et al. (2021),

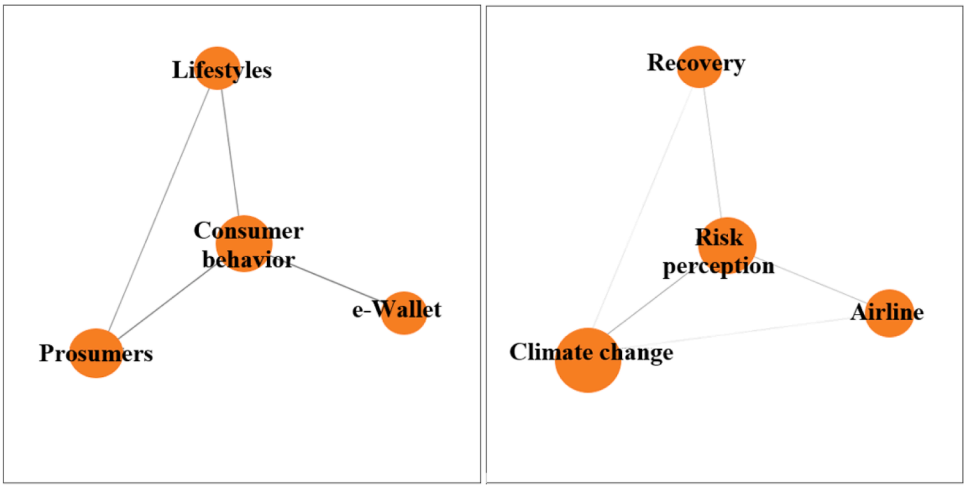

Fig. 5. Thematic networks assessing effects of COVID-19 on technology in the tourism industry.

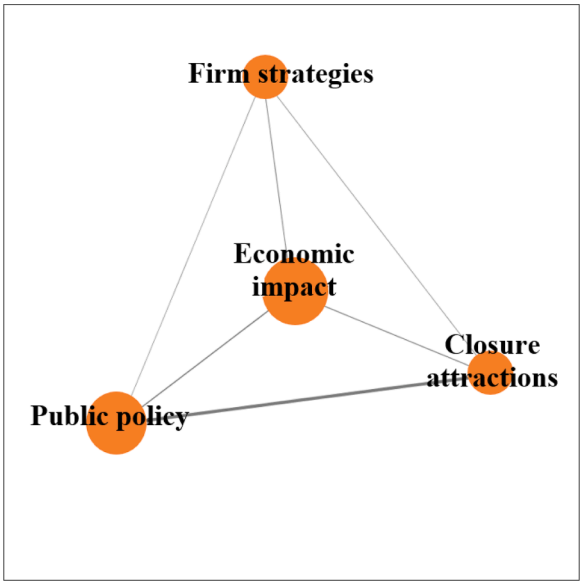

Fig. 6. Thematic networks revealing effects of COVID-19 on consumer behavior in the tourism industry.

who observed reductions in noise levels during the COVID-19 restrictions comparable to those found during the two most popular public holidays. These publications indicate that the new normal will attach comparatively high importance to more sustainable, inclusive forms of tourism, based on a circular economy that rewards the environmental and social well-being of all stakeholders, namely residents, tourists, institutions, and tourism companies. This will inevitably lead to an activation of local relations, networks, and connections that could benefit local economic development.

A study by Jones and Comfort (2020) is of particular interest, as it offers some thoughts on modifications in the relationships between sustainability and the tourism sector subsequent to COVID-19. According to these authors, "The COVID-19 crisis is a spur to promote sustainable development much more widely, as an integral part of business continuity and recovery measures within the tourism industry". They highlight the need for tourism professionals, governments, consumers, and health managers to work together efficiently not only to guarantee a safe society but also to meet the need for shared rules to encourage sustainable economic growth. According to Chen (2021), the future of sustainable cities must include the integration of interdisciplinary knowledge, open information, and moral responsibility, and that will only be possible if all stakeholders (including relevant industries, governments, and communities) can together establish more socially inclusive policies and regulations for sustainable cities in a systematic manner. Investigations such as those by Chang, McAleer and Ramos (2020) and Ioannides and Gyimóthy (2020) further note that the COVID-19 crisis constitutes a great opportunity to escape the path of an unsustainable, overcrowded global tourism market. These results are in line with previous research findings in the field of nature-based tourism (Tyrväinen, Uusitalo, Silvennoinen & Hasu, 2014).

5.2.2. *Interest in local development*

To achieve such sustainable development in the hospitality and

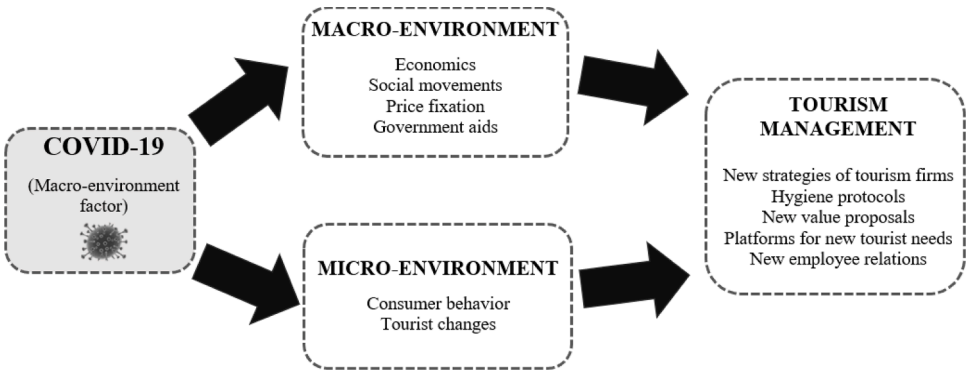

Fig. 7. Conceptual framework for effects of COVID-19 on tourism management.

tourism sectors, academics emphasize the need for local rather than global growth. In this regard, Jones and Comfort (2020) presented the term "human flourishing" as an alternative in the tourism industry that can reshape the sector into a model that is more inclusive of the stakeholders that rely on it, including host communities. This reasoning aligns with the conclusions of Everingham and Chassagne (2020), who noted that the future of the hospitality and tourism industries must be small-scale and local and benefit host communities. Renaud (2020) argued that "power relations with destination communities can be critiqued using the concepts of global mobility and local mobility to show that the former is a weakness for the industry in a post-pandemic perspective of reduced mobility". These authors contend that cities must make use of the sector's confidence in international mobility as leverage to rebuild the balance of power and encourage national mobility. In addition, Tomassini and Cavagnaro (2020) put forward a crucial consideration of the effects of COVID-19 on tourism and forecast positive activation of local networks that will enable sustainable, social, and local economic growth. According to Kunzmann (2020), the future of hospitality and tourism "will range from 'Return to normal after summer' to 'New power for the public sector' and 'Tourism at home'".

Researchers in the hospitality and tourism field suggest that other forms of tourism and leisure will help achieve these sustainable and localized goals. For instance, Abbaspour, Soltani and Tham (2020) propose that tourist feelings and medical tourism images can be useful to help recovery plans. Seraphin and Dosquet (2020) encourage the development of second-home and mountain tourism as key paths in the development of further lines of personal and relaxing leisure activities. Furthermore, investigations have shown the emergence of new xenophobic tendencies among residents and consumers, as COVID-19 may have contributed to deepening in-group/out-group biases among foreign customers and residents (Zenker & Kock, 2020).

5.2.3. Technology and smart cities

Before the COVID-19 outbreak, scholars such as Yuan, Tseng and Ho (2019) noted that we were in the midst of a transition to a new era of hospitality and travel based on the convergence of disruptive effects in the form of new technologies. This change has favored a proliferation and consolidation of smart cities, that is, those that strategically introduce information and communication technologies to improve their competitiveness and, simultaneously, residents' quality of life (Yang et al., S., 2021). Along with consumer concerns for more sustainable and safe spaces, this makes technology a basic element in city development and the tourism sector. According to Gretzel (U., 2020), COVID-19 has even heightened the need for more digitized, technological, and safe sectors that allow for monitoring of the flow of consumers and citizens.

On the one hand, the pandemic has encouraged what U. Gretzel et al. (2020) label e-hospitality and e-tourism, i.e., the application of IT and e-commerce to hospitality and tourism. The use of websites and social media in these sectors, according to these authors, facilitates a fast, secure, comfortable, vivid, and minimalist consumer experience (see Angostino et al. (2020) for the case of Italian museums). Technology can likewise facilitate consumer tracking and monitoring (Sun, Shao & Chan, 2020). That is, the role of e-commerce, robotics, and artificial intelligence has increased to assist with managing the spread of COVID-19 in cities, tourism firms, hotels, and bars (e.g., Jiang & Wen, 2020; Makarius, Mukherjee, Fox & Fox, 2020; Zeng, Chen & Lew, 2020). According to these authors, robots, autonomous vehicles, and drones could be used in diverse ways to decrease tourist contact and possible dissemination of the virus, including delivering materials, disinfecting and sterilizing public spaces, and detecting or measuring body temperature. Further, Zeng et al. (2020) considered that the focus should now be placed on developing robotic applications that can improve the tourism experience, preserving cultural and natural environments, understanding the social implications of decisions made about tourism, and recognizing the need for new professional opportunities in the sector. A study by Zwanka and Buff (2020) evaluated potential consumer behaviors derived from the COVID-19 pandemic. These authors showed that, among other behaviors, consumers will make more use of online ordering (especially for products related to agriculture, fitness, and pharmacy, at the expense of kids' activities or amusement parks), place more value on shopping experiences, replace travel with virtual reality, and reduce their restaurant visits

Second, the development of more digitalized cities is articulated in the concept of smart tourism, i.e., innovative destinations based on technology, sustainability, accessibility, social participation, and movement monitoring (Bassano et al., 2019; Kapera, 2018; Kunzmann, 2020; Liberato, Alen & Liberato, 2018). Following this reasoning, first, the current public health crisis has made it necessary to urgently reconsider transport and its impact on economic recovery in the post-COVID-19 era. These transport improvements would go beyond social considerations in relation to the environment and encompass considerations of social health and well-being (Budd & Ison, 2020). Jo, Lee, Park and Kim (2020) analyzed the case of South Korea as a smart city, where firms, citizens, and the government managed to flatten the curve during the COVID-19 crisis without closing their borders or their economy. In this case, the proactive exchange of information allowed tourists to form a shared comprehension of the context, while complying with the rules and security measures adopted to increase trust in the institution's ability to manage the crisis. Along this line, COVID-19 has highlighted the need for tourism organizations to create disaster management strategies. Creative and relevant products and services should be designed in partnership with health organizations so that they can be implemented in cities affected by pandemics in an integrated manner. Interestingly, a recent study by S. Yang and Chong (2021) showed that smart city projects significantly reduced the number of confirmed COVID-19 cases. Specifically, for every 1 million yuan increase in smart city investment per 10,000 people, the number of confirmed cases per 10,000 people decreased by 0.342.

These normal planning activities, primarily environmental, will serve to mitigate the effects of another crisis (Allam & Jones, 2020). Second, authors such as Allam and Jones (2020) urge global architectural and tourism firms to add pandemics to their disaster management action plans. Along this line, Jiang and Wen (2020) went deeper into the impacts of COVID-19 on hotel practices and concluded that artificial intelligence, cleanliness, and health care should all be considered in future tourism strategies. Choi, Lee and Jamal (2021) concluded in their case study that smart governance can develop smart justice that encourages equity in data sharing and resource allocation among inhabitants and tourists. Kuang and Lin (2021)) recently proposed that public and governmental participation are key to creating smarter sustainable cities; according to their findings, those who live in communities with more supportive and smarter facilities are more likely to participate in sustainable behaviors such as classifying garbage.

5.2.4. Luxury and private services

Fear of unfamiliar places and the hustle and bustle of travel could place greater value on the search for individualized, personalized, and luxury tourism services. Wen et al. (2020) evaluated the effects of COVID-19 on Chinese citizens' lifestyle and purchases and confirmed that it will likely increase the popularity of independent travel, luxury purchases, and wellness tourism services. Along the same line, Kim and Lee (2020) investigated the impact of the perceived threat of COVID-19 and its relevance to consumers' preference for private dining facilities. Their results show that consumers who think the threat of COVID-19 is high (vs. low) value private dining tables and restaurants. Furthermore, the importance of COVID-19 triggers a preference for private (vs. non-private) dining table and rooms.

5.2.5. Hygiene and health protocols

Ivanova, Ivanov and Ivanov (2020) assessed tourists' intentions to travel after the COVID-19 outbreak and revealed that they were willing to travel within 2 months after it is permitted in their location. A

trustworthy health system in a smart location will be a key driver of consumers' decisions. Interestingly, women and older persons reported stronger safety and health preferences than men and younger persons. Wong and Yang (2020) attempted to explore tourists' experiences in quarantine lodging during COVID-19. Their results indicate that travelers' level of anxiety accounted for the interaction between their length of stay and health status. Graham, Kremarik and Kruse (2020) evaluated the perceptions of aging consumers with regard to air travel after the COVID-19 outbreak. The authors concluded that elements such as quarantine rules and flexible ticket booking were not pivotal drivers impacting travel decisions, and getting to the airport is seen as the safest step. In a similar vein, Zenker and Kock (2020) noted that consumers may become more alert to crowds and avoid unknown things (i.e., xenophobia toward foreign food or restaurants).

5.2.6. *Tourist emotions in the new normal: sentiments and perceived risk*

Several investigations point out that tourists may value options that promote emotional experiences more highly, as they now evaluate the risk and sentiment of the visit according to the management of the pandemic crisis at the destination. For instance, Qiu, Park, Li and Song (2020) indicated that the intention to travel is influenced by one's perception of risk and level of familiarity with the destination. Similarly, Chen, Xia and He (2020) showed that, during the COVID-19 crisis, risk perception for travelers was increased by the number of vehicle changes for transport, travel time, and the impact of the pandemic on the tourist space. These authors contend that reducing the risk by offering countermeasures will revitalize the hospitality and tourism industries (Chen et al., 2020). Aji, Berakon and Husin (2020)) found that the willingness to use e-wallets is affected by perceived risk and usefulness. Byrd et al. (2021) evaluated the risk perceptions of tourists in restaurants. Their results show that tourists are more worried about buying restaurant food than food in general. Furthermore, consumers are deeply concerned about buying food served cold or uncooked. Along the same line, Zheng, Luo and Ritchie (2021) revealed that travel fear provokes coping behaviors among travelers, increasing their resilience and causing them to develop cautious travel behavior. Recently, Pan et al. (2021) assessed the extent to which cruise travel constraints (such as COVID-19) and perceived pandemic crisis management affect post-pandemic cruise intent. The results revealed that restrictions are negatively related to confidence in cruising, which ultimately affects travel intent. Additionally, the perception of crisis management is positively related to confidence and one's attitude to returning to cruise travel. Brewer and Sebby (2021)) recently found that the visual appeal of an online restaurant menu and the perception of COVID-19 risk positively influence purchase intentions and the perceived convenience of online ordering. Furthermore, Akhtar, Akhtar, Usman, Ali and Siddiqi (2020) revealed that the effect of the COVID-19 pandemic on consumer confidence and offline shopping choices was due to an increased sense of insecurity and risk.

5.3. *Effects of macro- and micro-factors on tourism destination management*

To cope with the increase in the above-mentioned macro- and micro-factors of tourism post-COVID-19, tourism firms will need to reset their strategies and traditional management paths, since the way they manage the crisis directly will affect consumers' intention to visit their destinations (Pan et al., 2021).

Particularly, the experience of COVID-19 in the tourism sector has meant changes in the strategies of organizations and their workforce. Filimonau, Derqui and Matute (2020), for example, investigated whether the organizational resilience of tourism firms, e.g., their response to COVID-19, impacts how managers understand job security, and thus affects their commitment to remain in their organizations. The findings showed that organizational action with regard to COVID-19 influences perceived job security and increases managers' organizational commitment. Along the same line, Mao, He, Morrison and Coca-Stefaniak (2020) found that corporate social responsibility positively affected employee self-efficacy, optimism, and hope based on employee satisfaction with the business's response to COVID-19. Similarly, Kraus et al. (2020) found stronger solidarity and cohesion within national and international companies as well as increased digitalization. In an attempt to analyze how opening tourism businesses with restricted capacity might be achievable, Tsionas (2020) concluded that "reopening gradually requiring only nonnegative profits is quite feasible but reopening requiring the same level of profit as in the pre-COVID-19 period is considerably more difficult, and […] reopening at [a] capacity near 33% [seems feasible]". These new forms of tourism management will be crucial to address growing tourist interest in sustainability and accessibility.

According to Sigala (2020), to address tourists' health and physical contact risks, tourist firms will need to include new cleaning and hygiene protocols, redesign consumer experiences, and rethink new business ecosystems and partnerships. Furthermore, tourist spaces and policymakers will have to encourage health passports and health identities. Collaborative projects may be pivotal to enable health professionals and tourism researchers to develop collaborative medical knowledge post-COVID-19 for reconstruction of the tourism sector. Such a strategy will allow for protection of the health and well-being of all tourism stakeholders, including consumers and workers. Ludvigsen and Hayton (2020) noted the relevance of such an interdisciplinary approach, which engages with the individual and social impacts associated with secure mega-event organizations.

To face the new technological challenges in the tourism sector, Sigala (2020) stated that tourism management will have to develop important updates and improvements on digital platforms, promote the use of artificial intelligence and online payment methods, and make ticket reservations more flexible. For example, the museum sector did not stop during the lockdown and went digital during COVID-19 (Angostino et al., 2020). Social media increased online initiatives and numbers of visitors.

6. Discussion

The current COVID-19 crisis placed tourism professionals and academics in the center of an information pandemic, as these industries are two of the hardest hit by the outbreak (Hao et al., 2020). Although a great deal of research has assessed the effects of COVID-19 on the city development and tourism sectors, no study has assessed the increasing number of publications in the field of tourism and COVID-19 or the main research clusters that could be consolidated as a starting point for future studies on cities. Therefore, it is our aim to quantify this scientific production, clear up its main authors and scientific outlets, describe and visually display its most relevant research streams, and provide a research agenda for specialists in smart and sustainable cities. Consequently, this paper contributes to the existing literature on COVID-19 and sustainable cities, as it develops a critical examination of the current research and highlights the research gaps that must be filled by future studies. Particularly, a bibliometric analysis was conducted of publications on COVID-19 and tourism by means of SciMAT software to shed light on the current scope, features, and topics of interest with regard to the impact of COVID-19 on the tourism sector. The current paper makes headway in research on COVID-19 and tourism, as it presents a deep analysis of the research and proposes a way forward in tourism research and practice.

Regarding RQ1, the study revealed a corpus of 1303 manuscripts on COVID-19 and the hospitality and tourism sector published between 1 December 2019 and 31 March 2021 present in outlets indexed in WoS and Scopus. The bibliometric analysis addresses RQ2: publications related to hospitality are in journals such as *International Journal of Hospitality Management* and *International Journal of Contemporary Hospitality Management*. Other studies have appeared in publications such as

Current Issues in Tourism, Tourism Geographies, and *Journal of Sustainable Tourism*. Following the results of Torres-Salinas (2020), our findings highlight that over 60% of articles on COVID-19 and tourism are open access. The findings of the content analysis answer RQ3 by highlighting nine main clusters of COVID-19 and tourism. Particularly, this study demonstrated that social media and smart tourism are driving themes with high potential for development and relevance in the tourism field in the new normal. The rise of digitalization and tourists' interest in sustainable, accessible, and smart tourism justify the potential growth of both major clusters. The content analysis of this work also corroborates that, even if they are underdeveloped, sustainable tourism and tourist risk perception are topics of enormous relevance in the new form of tourism management that both companies and academics should consider in the near future. Academic work emphasizes that the future development of the hospitality and tourism sectors should encourage sustainability and social growth, consideration of all stakeholders (with a special emphasis on communities of origin), and the application of technology and digitalization to the supply of services in smart city environments. Academia has used the major theme of public health in the field of tourism as an intersectional axis, since it constitutes one of the main drivers of attitudes, intentions, and behaviors in tourist destinations in the new normal. Finally, the most developed topic in the field of tourism and hospitality after COVID-19, although of little relevance, is the economic impact of the pandemic on the tourism sector. Academics in the tourism industry have assessed the effects of COVID-19 on the performance of restaurants, airports, art recreation, hotels, and cruise ships, as well as the decline in demand in these sectors.

In order to identify the forms of tourism, tourism management, and tourist behavior that will gain comparatively more importance at the global level in the new normal after COVID-19 (RQ4), the current research further developed an empirical review of the selected studies. Particularly, building upon the theoretical framework of the impacts of micro- and macro-environmental factors on tourism management, we analyzed how COVID-19, a macro-environmental factor, has affected other macro-environmental forces (such as economics, social movements, and tourism-related lifestyles) and micro-environmental forces (such as modifications in tourist behavior), as well as the effects of these two major types of drivers on changes in tourism management (Mhlanga, 2019; Polo-Peña et al., 2012; Wang & Ap, 2013). The results not only allow us to classify the main thematic axes established above into tourism research domains, but also help us to identify potential research avenues in the field of tourism management in the future. Fig. 8 presents the identified issues and the corresponding research questions to be addressed.

Particularly, the intersectional and highly developed thematic axes have been addressed in studies that analyze the effects of COVID-19 on other macro-environmental factors of tourism companies, such as the social and economic consequences to the tourism industry, structural modifications in global tourism demand, and government measures in the tourism sector. However, the indirect effects of tourism industry losses on supporting sectors (such as hospitality, museums, travel insurance, and overnight stays) have hardly been investigated. Future research should delve deeper into the changes in the pricing structure in the tourism sector after COVID-19 and the most efficient types of institutional support for the reconstruction of the sector.

Most of the research has focused on the thematic areas previously referred to as motor themes (social media and smart tourism/smart cities) as well as emerging ones (sustainable tourism, consumer behavior, and tourist risk perception), all of which are related to the effects of COVID-19 on the most relevant micro-environmental factor, tourist behavior. Specifically, the literature has identified six fast-growing trends in tourist behavior in the new normal: sustainability, interest in the local, technology, and smart cities, luxury services, hygiene protocols, and tourism emotions. Although previous research looked into the future of these new forms of tourism and consumer behavior (Grilli, Tyllianakis, Luisetti, Ferrini & Turner, 2021; Iloranta, 2019; Pasquinelli & Trunfio, 2020), prospective investigations are well positioned to reanalyze the presence of new competitors in the new normal (such as sparsely inhabited cities, mountain-related firms, or businesses that personalize and individualize tourist services) and understand tourists' attitudes, use, adoption, and satisfaction regarding these emerging forms. Previous studies in the field of tourism management (Liberato et al., 2018 or Bastidas-Manzano, (2020) evaluated tourist preferences and behaviors with regard to technological and sustainable environments. Nevertheless, the emergence of COVID-19 should further encourage analyses of the influence of ICT, IoT, and Big Data on the spread of COVID-19 in the tourism context; explore the effects of technological developments on the environment, populations, and local economies (e.g., Gilliland, Sanchirico & Taylor, 2020); better understand the drawbacks and advantages of adopting digital and artificial intelligence in the hospitality and tourism industries; and create labels or classifications of tourism destinations based on how smart they are (i.e., considering their use of technology, accessibility, sustainability, and participatory governance). Future studies should also analyze the impact of each of dimension of smart city projects—participatory governance, sustainability, accessibility, and social economy—on the prevention, control, and spread of COVID-19 (S. Yang & Chong, 2021). Prospective studies should also focus on how the COVID-19 pandemic altered the images of particular destinations and how consumers alter their decisions in light of the pandemic. Future research should also follow the path set out by Arbolino, Boffardi, De Simone and Ioppolo (2021) for sustainability planning and management in tourism. Such research could also follow the guidelines set by Lozano-Oyola, Blancas, González and Caballero (2019) to objectively improve sustainability indices at tourist destinations. Amid this resetting of the tourism sector, Prayag (2020) recognizes the resilience of companies and consumers as a key driver of prospective research related to COVID-19.

Importantly, the growth in relevance of tourists' emotional states justifies the use of psychological and neural tools (such as eye tracking or electroencephalography) to better understand their perceived risk and emotional drivers during and after the COVID-19 pandemic (Ramsoy et al., T. Z., 2019). Recent studies confirm that the emotional component of the tourist experience is more dynamic than the cognitive one (based on perceptions and beliefs) and captures experiences to a greater extent. Indeed, Wang et al. (2020) suggest that the ultimate purpose of the tourist experience is to seek reward, and its basic level of expression is affection and emotion, which are antecedents of tourist decision-making. Accordingly, future investigations in this regard could be categorized in the branch known as consumer neuroscience, "the study of the neural conditions and processes that underlie consumption, their psychological meaning, and their behavioral consequences" (Bastiaansen et al., 2018). There is already some research in this area, such as studies by Ramsoy et al. (T. Z., 2019), Bastiaansen et al. (2018), and Li, Huang and Christianson (2016).

Although not extensively, there is research underway evaluating the effects of macro- and micro-environments on tourism management. According to the analyzed studies, in order to cope with the increase in the above-mentioned typologies of tourism and the new tourist profile post-COVID-19, tourism firms will first need to change their traditional management paths and address the health and physical contact concerns of tourists, encourage the use of health passports and health identities, and develop collaborative projects to enable health professionals and tourism researchers to implement collaborative medical knowledge post-COVID-19. Second, tourism companies and institutions must reduce the risk of visiting their destinations by implementing measures such as flexible booking, virtual visits, accelerated digital data analytics, trustworthy payment environments, and visually appealing search platforms. Third, tourism companies need to integrate sustainability and corporate social responsibility as strategic elements in their entire value proposition: focusing on recycling strategies, encouraging renewable energies, and monitoring the impact of tourism activities will make a difference. This will lead to not only accessible and low-polluting tourist

Concern	Knowledge domains	Research questions to be addressed
MACRO-ENVIRONMENT **Effects of COVID-19 on the tourism industry: Economy, travel, prices and workforce**	Economic and social consequences of COVID-19 on the tourism industry Demand and price for tourist and hospitality services Governments and aid to the tourism sector	- How much are the economic costs for tourism companies to comply with hygiene protocols? - Are there differences in the number of tourist arrivals depending on the country of origin, size or characteristics of the tourist destination in the new normal? - What are the most effective aid measures implemented by governmental institutions for rebuilding the tourism and hospitality sectors? Why? - Are changes in package tour prices identical in all subsectors? Why? - What are the direct and indirect effects of losses in the tourism sector on other secondary sectors?
MICRO-ENVIRONMENT **Effects of COVID-19 on tourist behavior**	*Sustainability* Social and environmental wellbeing Circular economy model Conjoint work of tourism industry, governments, consumers and health professionals	- What are the drivers and consequences of climate change and over tourism on consumer satisfaction in the new normal? - How does the COVID-19 pandemic alter images of particular destinations and how consumers alter their decisions in light of the pandemic? - How do changes in consumers' experiences, attitudes, and intentions to visit and revisit destinations impact booking patterns and promotion strategies?
	Interest in the local Small-scale local and benefit host communities Activation of local relations, networks and connections New forms of tourism and leisure: sentiments, mountain and medical	- What are the advantages and disadvantages of local tourist destinations for tourist satisfaction in the new normal? - To what extent do local tourist destinations have sufficient infrastructure to deal with new tourists? - What are the attitudes, usage, adoption and satisfaction of tourists towards new competitors (namely, sparsely inhabited cities, mountain-related firms or medical tourism? - What kind of relationships between government institutions and tourism companies are the most efficient for the reconstruction of the tourism sector?
	Technology and smart tourism e-Hospitality and e-Tourism e-commerce, robotics and artificial intelligence Smart cities and sustainable transport	- What are the quantitative and qualitative implications of ICT, IoT, and Big Data on consumer attitudes in the new normal? - What are the effects of technological developments on the environment, the population, and the local economy in the new normal? - What are the drawbacks and advantages of the adoption of digital and artificial intelligence in the hospitality and tourism industries? Why and to what extent are these tools more highly valued? - Can *smart tourism* labels be created based on technology, accessibility and sustainability of tourism destinations?
	Luxury and private services Individualized and personalized tourism services Private dining facilities	- What are the main psychological drivers that encourage tourists to prefer private and individualized services in the new normal? - What price is the tourist willing to pay for these personalized services?
	Hygiene and health protocols Trustworthy health system as a driver Quarantine rules and flexible ticket booking Alert to crowdedness	- To what extent do hygiene protocols reduce the risk to the trip? What about attitudes and intentions? - Can labels be developed to designate 'sanitized' destinations? - Are there moderating variables such as gender, status or social class that affect the perception of hygiene measures?
	Tourist emotions Emotional experiences Effects of risk and threat perception on travel and purchase decision-making	- How can psychological and neural tools help better understand the perceived risk and inner feelings in the new normal? What is their added value? - What situational and personal factors affect the perception of risk towards the tourist destination?
EFFECTS OF MACRO- AND MICRO-FACTORS ON TOURIST AND HOSPITALITY MANAGEMENT	Cleaning and hygiene protocols Rethink business partnerships Develop health passports and identities Digital data analytics Visually appealing search platforms Implement corporate social responsibility Retain workers	- What are the effects of flexible, virtual booking visits and cleaning protocols on the cost and pricing structure and value proposition of tourist firms? - How can tourism companies integrate sustainability and corporate social responsibility as strategic elements in their entire value proposition? - How can tourism firms encourage renewable energies or monitor the impact of tourism activities in the new normal? Are these measures highly valuable for tourists? - What elements should be included in the layout of the tourism website to increase the attitude and intention to visit the tourist destination during and after the COVID-19 period? - How to create new emotional experiences for the tourist on the web and in the tourist destination while complying with social distance measures?

Fig. 8. Main knowledge domains corresponding to research questions.

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services, but also global collaboration to face climate change and environmental problems and make a strong commitment to retain and value workers.

Theoretically, this study represents an advance in the lines of research and management in the field of tourism and cities derived from COVID-19. Earlier studies in the field of sustainability and tourism bibliometrically analyzed the relevance of multidisciplinary studies on COVID-19 in tourism (Wen et al., 2020) and human mobility behavior in cities during the pandemic (Benita, 2021), and the impacts and implications of resetting research and international sectors have been specified (Farzanegan et al., 2020; Sigala, 2020; Škare et al., 2020). In order to analyze the effects of COVID-19 on environmental levels in cities, other research has clarified the impacts of COVID-19 on improved indoor air quality (Benita, 2021) or prevention and treatment methods and effective parameters (Rahmani & Mirmahaleh, 2021). Our study constitutes a step forward in this respect, as it clarifies for the first time the importance and development potential of the above-mentioned topics for the future of cities and the tourism sector. In addition to identifying the most relevant authors, journals, and articles in the discipline, we concluded that social media and smart cities and tourism are the motor themes with the greatest potential; sustainable cities, local destination development, changes in tourist behavior, and tourists' risk perception are underdeveloped streams with enormous relevance and potential for growth in the new normal. The effects of COVID-19 on citizen health and its economic effects on the tourism industry and cities are intersectional and highly developed topics, although of little relevance. Interestingly, our findings provide insight into the challenges and questions that sustainable cities research should answer in the new normal along diverse lines, such as macro-environmental factors (economy, travel, prices, and workforce), micro-environmental factors (consumer behavior, sustainability, technology, and hygiene protocols), and future management and city decisions.

It is worth noting that the current study only made use of research work indexed in the Scopus and WoS databases and did not assess all published materials. We did not consider preprints. Although unreviewed versions of articles represent a rapid advance in knowledge, it is precisely the lack of external and independent control that limits their contribution to tourism research. In fact, relying on preprints could lead to erroneous decisions by organizations and government institutions in the management of tourism. Even though we used a well-established and robust tool (SciMAT) and perspective in the area of social sciences to represent the density and centrality in the strategic diagram (e.g., Díaz-López, Carpio, Martín-Morales & Zamorano, 2019; Sepulcri, Mainardes & Marchiori, 2020), future research should corroborate the current conclusions by using Graph Theory, a math technique for studying graphs, with high applicability in the field of human brain networks (e.g., F. V. Farahani, Karwowski & Lighthall, 2019).

7. Conclusions

Despite the rapid increase in the number of publications on COVID-19 and city development, it is surprising that no research has developed

a synthesis of this increase. The present study constitutes the first bibliometric study to identify the main topics of interest, authors, and journals that are worth considering for the future of tourism research. Our findings revealed that social media and smart tourism are the themes with the greatest potential; sustainable cities, local destination development, changes in tourist behavior, and tourists' risk perception are underdeveloped streams with enormous relevance and growth in the new normal. Research on the effects of COVID-19 on citizen health and its economic impact on the tourism industry and cities are intersectional and highly developed topics, although of little relevance. Furthermore, we identified the challenges of future city development, tourism research and practice, and we proposed future directions for research on city and tourism management in the new normal. City planners and tourism managers should take advantage of such results to design more sustainable, local and smart cities.

Declaration of Competing Interest

None

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