



Tourists' Health Risk Threats Amid COVID-19 Era: Role of Technology Innovation, Transformation, and Recovery Implications for Sustainable Tourism

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Technology innovation has changed the patterns with its advanced features for travel and tourism industry during the outbreak of COVID-19 pandemic, which massively hit tourism and travel worldwide. The profound adverse effects of the coronavirus disease resulted in a steep decline in the demand for travel and tourism activities worldwide. This study focused on the literature based on travel and tourism in the wake global crisis due to infectious virus. The study aims to review the emerging literature critically to help researchers better understand the situation. It valorizes transformational affordance, tourism, and travel industries impacts posed by the virus COVID-19. The study proposed a research model on reviving the international tourism activities post COVID-19 pandemic to gain sustainable development and recovery. The scholars have debated seeking the best possible ways to predict a sustainable recovery of travel, tourism, and leisure sectors from the devastating consequences of coronavirus COVID-19. In the first phase, the study describes how the current pandemic can become transformational opportunities. It debates the situation and questions related to the emergence of the COVID-19 outbreak. The present research focuses on identifying fundamental values, organizations, and pre-assumptions related to travel and tourism revival and help academia and researchers to a breakthrough in initiating the frontiers based on research and practice. This study aims at exploring the role of technological innovation in the crisis management of COVID-19 tourism impacts, tourists' behavior, and experiences. The travel and tourism industry's main stakeholders include tourism demand and organizations that manage tourists' destinations and policymakers. They have already experienced the stages of responses, recovery, and resetting tourism recovery strategies. The study provides valuable insight into the coronavirus consequences on travel and tourism and practical implications for global tourism and academic research revitalization.

Keywords: COVID-19, psychological reactance, social distance, consumer behavior, employees' workplace behavior, B2C, tourism recovery strategies

INTRODUCTION

The COVID-19 virus transmits from individuals' interaction and physical contact, giving rise to mobility bans, travel restriction challenges, and community lockdowns as vaccine availability still remains a global challenge (Rothan and Byrareddy, 2020; Shi et al., 2020; Su et al., 2021a,b). As a result, psychological fear and anxiety emerged that compelled people to avoid social gatherings. Staying at home caused devastating psychological effects on the hospitality, leisure and tourism industries (Gössling et al., 2020; Yin and Ni, 2021). The pandemic has posed challenges on how tourists can cope with the COVID-19's consequences for travel, hospitality and tourism activities worldwide (Liu et al., 2021; Mubeen et al., 2021a,b; Ge et al., 2022). Travel challenges have gained much attention from academics and researchers of tourism. Scholars argued that business managers and organizations' owners of the tourism industry are keenly interested in finding alternatives to discover innovative ways to revive tourism activities amid the COVID-19 challenging situation (Duarte Alonso et al., 2020). The literature has shown a steep decline in tourism activities due to the emergence of the pandemic COVID-19. Scholars have paid attention to discover new safe ways to minimize tourists' psychological stress from the perspective of tourism firms; as less occupancy and limited rooms' availability, operations in travel and tourism have significantly declined worldwide (Buckley and Westaway, 2020; Park et al., 2020, 2021).

The steep decline in tourism activities has resulted in massive unemployment as service firms laid off employees due to bans and closure of business operations (Kreiner and Ram, 2020; Kaushal and Srivastava, 2021; Tu et al., 2021). Tourism restrictions and travel bans have resulted in mental stress and psychological problems among employees. They have felt the threat of layoff and increasing unemployment ratio that has affected hospitality and tourism firms' employees performance. Consequently, under the circumstances of the current virus pandemic, hospitality and tourism firms have experienced substantial economic losses, and employees have seen sadness, uncertainty and anxiety (Abbas et al., 2021; Rahmat et al., 2022; Yao et al., 2022). Thus, employees psychological state, emotions, and behavioral reactions are crucial to face the challenges of the COVID-19 pandemic (Sah et al., 2020). As a result, hospitality and tourism firms' employees have shown fear of providing physical services for tourists due to the chance that the COVID-19 transmission might be asymptomatic (Aguilar-Quintana et al., 2021). The past literature has shown fear, anxiety and adverse psychological state of employees working in the tourism industry (Vu et al., 2021). Thus, the pandemic COVID-19 emergence has negatively influenced employees performance working in travel, hospitality and tourism firms (Deffenbacher, 1977; Stefan and David, 2013; Frode et al., 2017; Sklett et al., 2018; Narayanamurthy and Tortorella, 2021).

This pandemic caused by the COVID-19 virus has resulted in a gigantic travel crisis for the hospitality industry such as travel and tourism (Aqeel et al., 2021, 2022; Ge et al., 2022; Zhou et al., 2022). The advent of the coronavirus outbreak has significantly affected global social, political, economic, and

socio-cultural systems worldwide. Health communications and prevention measures, such as staying at home, mandatory-quarantine campaigns, social distancing, mobility and travel bans, border closure, and community lockdowns, have halted the travel and tourism industry. It is a highly vulnerable sector to numerous risk factors. Still, tourism has become resilient in reviving to the next normal from various epidemics and pandemics, such as earthquakes, MERS, SARS, Ebola, and Zika (Novelli et al., 2018). Thus, the unprecedented settings, nature, and the COVID-19 pandemic impacts demonstrate indication that the crisis is distinct and will have profound long-term transformational and structural changes to the travel, leisure, and tourism industry (Škare et al., 2021). The pandemic posed huge adverse effects because of the global travel restrictions and a sharp slump in tourism demand among tourists and travelers (Verma and Gustafsson, 2020). The coronavirus outbreak has massively affected the tourism industry as many states and territories imposed travel restrictions and social gatherings in attempts to contain the COVID-19 disease spread (Aleta et al., 2020). The travel and tourism industry is one of the most affected industries as this sector has met the hardest hit of the COVID-19 pandemic. The global internal travel and tourism activities showed a 51% drop in revenue, amounting to 2.86 trillion U.S. dollars. Besides, the experts have forecasted the tourism market to recovery rapidly, and it will reach the next normal levels of 2019 by 2023. High-end luxury tourism is vital, and the leisure industry paid particular attention to satisfy the lavish tourists' travel expectations, as they are high-net-worth travelers. This tourism segment also saw a steeper decline in 2020.

The global internal luxurious tourism saw a 54% decline, which resulted in a slump in revenue and business growth worldwide. According to an estimation, the United Nations World Tourism Organization reported that global tourists and travelers plans might decline by 60–80% in 2020 (Neuburger and Egger, 2020). It would lead to a potential economic loss of 0.9 to 1.20 trillion dollars in the international tourism business. Many tourist places and cities reported an 80–90% decline in planned travel (Bhaskara and Filimonau, 2021). Conflicting and unilateral tourism restrictions on travelers occurred regionally (Kallbekken and Sælen, 2021), and many global tourist attractions, such as amusement parks, sports venues, and museums, were under visitor restrictions (Oum and Wang, 2020). UNWTO specified a 65% decline in international tourists' arrivals in the first half of 2020 (Miech et al., 2021). Air passengers' travel reported a drop of more than 60% worldwide (Hao et al., 2020). Globally, the travel and tourism industry is the most significant contributor to the service sector, and it plays an indispensable role in the world economy (Arbulú et al., 2021). The tourism sector is a vital socio-economic factor for the community (Aman et al., 2019). According to 2018 estimation, tourism and travel sectors helped produce almost 10.42% of the global GDP, and this industry generated a similar share of global employment (Lei et al., 2021). Tourism activities have shown massive resilience and support over the last decade. The COVID-19 pandemic has massively struck travel and tourism and caused adverse effects. Fueling this industry and relative stability for the middle-class people's growth purpose in Asia and other regions of the world helps

expand the tourism industry. Travel and tourism experts expect a significant contribution to world GDP and anticipate a rise of almost 50% in the coming decade (Jucan and Jucan, 2013; Canh and Thanh, 2020).

European countries are the major markets in the global tourism industry and represent one in two trips (50%) worldwide, which accounts for almost 48% of the total outbound tourism (Boluk et al., 2019). The tourism industry is a crucial segment of the service sector. It is the most significant contributing factor as well as an economic driver of gross domestic product (GDP) for respective countries (Wondirad et al., 2021). According to the data of 2018, the DACH region comprised of Germany (D), Austria (A), and Switzerland (C.H.), and these countries specified their GDO 5.1 trillion dollars (UNWTO, 2019). The service sector in Australia contributed 62.50% to the total Australian GDP. In Germany, the service industry contributed 61.8%, and Switzerland's service sector contributed 71.4%. The DACH region's outbound tourism accounted for over 135 million travelers in 2018. Germany is the third-largest spender at 94 billion dollars for tourism activities (Daye et al., 2019; Neuburger and Egger, 2020).

Scholars of tourism studies have paid close attention to perceived socio-economic and the actual contribution of tourism activities to communities of destinations (Lindberg and Johnson, 1997; Mamirkulova et al., 2020; Joo et al., 2021). Inbound tourism creates a profound influence on society, and in conjunction with its positive impacts, tourist arrivals interfere with residents' economic, cultural and social wellbeing in the tourist destinations (Jordan et al., 2021). However, inbound tourism's adverse effects have been exacerbated in crises and disasters, such as the emergence of the COVID-19 pandemic (Tambo et al., 2021). At present, the world has faced a global health crisis and economic disaster in the form of the novel virus COVID-19, which struck more than 200 countries and territories (Acter et al., 2020; Agarwal et al., 2021; Lange, 2021). As the ongoing COVID-19 pandemic swept the entire world, many countries and regions imposed border shutdowns and travel restrictions to curb the quick spread of the infectious virus (Jimenez et al., 2020). Richter (2016) debated that appurtenance or re-emergence of infectious viruses is one of the consequences of declining world travel and tourism mobility trends. Globalization and urbanization are driving a quick spread of emerging viruses. However, tourism and travelers' play a vital role in exacerbating public health crises resulted in the emergence of epidemics and pandemics worldwide (Hall et al., 2020; Hilsenrath, 2020).

Thus, it is essential to quantify and identify the perceived socio-economic and social cost risks of travel and tourism activities in the emergence of the coronavirus outbreak to minimize the adverse impacts on tourism destination regions and cities (Abbas, 2020a; NeJhaddadgar et al., 2020; Su et al., 2020, 2021c). Scholars have paid attention to examining the negative consequences of COVID-19 on the travel and tourism industry. They debated how to revive this sector to a normal condition. Some empirical and qualitative studies have examined the impacts of the global crisis, including natural disasters, on the travel and tourism sectors (Blake and Sinclair, 2003; Kuo et al., 2008; Wang, 2009; Cró and Martins, 2017; Aliperti et al., 2019; Song et al., 2019; SioChong

and YukChow, 2020). However, existing literature specified that academia, researchers, and policymakers had paid less attention to how the tourism and travel industry can amplify global crisis events. Such disasters pose adverse impacts on stakeholders' and residents' public interest and wellbeing at tourist destinations (Ritchie, 2008). Social media platform plays a positive role for effective communication, and people seek health-related information by using social media from peer groups (Abbas et al., 2019, 2021; Abbas, 2020b, 2021; NeJhaddadgar et al., 2020; Maqsood et al., 2021; Su et al., 2021c; Zhou et al., 2022). Scott and Laws (2006) described that crisis impacts should be viewed as the interlinked business systems and different stakeholders, which make an attractive tourist destination. Additionally, the key stakeholders and destination residents are crucial in responding to crisis management events at tourist destinations belonging to both private and public sectors (Ritchie, 2008; Karl et al., 2020; Le and Phi, 2021; Sarkar et al., 2021).

The interlinked socio-economic, cultural, political, and psychological consequences of COVID-19 pandemic of this magnitude, the unforeseen trajectories as alternative historical trends might occur, and the old explanatory models with predictive powers may not work in this crisis. Besides, there is enough indication to claim that both academic research and the travel and tourism industry have matured enough to provide sufficient knowledge about how to investigate and efficiently: (i) design and implement global crisis recovery and responsive strategies (McKercher and Chon, 2004). Moreover, (ii) it urges in building resilience to address and manage future crisis events (Hall et al., 2018). The question arises what still lacks is the knowledge about how global crisis can foster economic activities and business industry change. How enterprises can convert the global crisis disruption into innovation transformation and implement research can enable informing, shaping and rethinking, and making efforts to reset the next normal of the travel and tourism industry.

SOCIAL MEDIA TECHNOLOGY SUPPORT IN GLOBAL HEALTH CRISIS

With the arrival of the COVID-19 virus, globally, people indulge in using social media as a tool more than usual. Individuals rely on online sources to receive health-related information to follow preventive protocols to minimize the risk of virus infection. They seek health information and protocols for their family members and other loved ones (de Calheiros Velozo and Stauder, 2018; Li et al., 2018). Technological applications and social media have been a welcome relief for global communities as these platforms have provided updated health-related information in this global crisis caused by the ongoing COVID-19 pandemic (Zhong et al., 2021). This research paper argues that examining social media's practical use in the context of the health disaster posed by the COVID-19 virus should help shed light on mental health tolls worldwide (Lebni et al., 2020; Mamirkulova et al., 2022). According to a survey conducted by the U.S. Census Bureau, almost 42 percent of individuals have reported depression symptoms and higher anxiety in December 2020. The survey

reported that it was nearly 11 percent higher than the preceding year. Hazarika's survey findings report identified similar findings on global COVID-19 psychological disorder and stress (Abbott, 2021). With the appearance of the pandemic (COVID-19) health crisis, Assam police investigated 239 individuals who called during April 2020. The callers' data reported that 46 percent of people showed anxiety symptoms, 22 percent had depression, and almost 5 percent showed suicidal ideation (Sathish et al., 2020; Kalantry and Tarafder, 2021). Enough to persuade the government to roll out a nationwide tele-mental health service to address cognitive health issues and wellbeing. Physical activity could be medicine and relief for non-communicable disease (NCDs) (Saqib et al., 2020). The data of 43,000 people were recorded through the tele-mental health service after the restrictions such as social distancing and lockdown protocols were lifted in the month of December 2020. The survey revealed that almost 9% of people showed anxiety disorder, 4% depression, and approximately 12% exhibited mental stress. The COVID-19 pandemic virus caused the health crisis (Abbott, 2021).

Social Media, Health-Related News, and Peer Support

In the recent era, social media use is typical to seek required information. SM use plays an active and integral role in providing people with the latest health-related information from peer support (Fang et al., 2020). Peer support is vital in this global crisis as this concept determines desired informational usefulness. It happens in situations when people share their knowledge experience and provide social, emotional support, and practical help to others in a crisis such as the COVID-19 pandemic. Peers provided health-related knowledge to help people avoid disease risk (Tan et al., 2021). Social media users consume health-related up-to-date information for themselves through their effective and useful peer support (Hosseini et al., 2019). Infected individuals need exigency treatment as they face risk factors in this global health crisis (Firouraghi et al., 2020). Users of the SM platform seek updated information related to health. Users keep connections with others, which creates a sense of belonging to like-minded people (Brewer, 2016). In emergency or critical circumstances, online resources, such as social media, offers peer support that develops self-esteem as well as self-efficacy among people and decreases the risks of self-uncertainty (McKenna and Bargh, 1998). Social media and online resources are vital to gaining knowledge about health-related information. Similarly, social interaction through social networks is essential for individuals' lives who are in need of medical care for their health issues (Naslund et al., 2016; Abbas et al., 2021; Sarfraz et al., 2021; Toqeer et al., 2021). Inclusively, online resources and social networks help receive peer support that provides communication ways for social interaction. These platforms reduce the risk of individuals' social isolation that helps manage depression symptoms, anxiety, secondary trauma, and mental disorders (Lin and Kishore, 2021; Yang et al., 2021).

Social Media Use and Health Behavior

Online resources, social sites, and social media are critical in shaping individuals' health behaviors as people gain health

information through these platforms related to the pandemic COVID-19 (Yoosefi Lebni et al., 2020, 2021; Khazaie et al., 2021). Ultimately, individuals have faced enormous stress and health threats posed by the COVID-19 pandemic, which is the reason for the excessive use of social media. The reason is that accurate information is demanded by people who seek precise health-related information. Users involve in social networks through social media, and they stay connected with their families, peers, and friends (Zhao et al., 2021). Social media apps are public communication sources, and interactions through social networks go beyond personal messages and correct protocols of the COVID-19 pandemic's information to foster reasonable awareness about virus prevention guidelines to minimize the infection among people (Tang et al., 2021). The pandemic has influenced people's behaviors in response to virus infections. It has mainly affected individuals' lifestyle patterns due to preventive protocols (Gevers et al., 2021). Due to the ongoing pandemic, the current health crisis developed a sense of prevention. People's life patterns are not in a standard routine as they follow prevention measures to avoid infection risks. This sense of prevention developed healthy behaviors, including restrictions, social isolation, and social distancing practices. Thus, health behavior theory has described individuals' health behaviors models (Rosenstock, 2005; Poursmaeil et al., 2019; Fattahi et al., 2020). These frameworks describe why people fail in adopting prevention measures, such as screening tests to identify early infection of the viral disease (Carpenter, 2010). In health crises, health behavior models provide pathways to comprehend helpful preventive protocols that help improve individuals' health-related behavior, such as the dedication of getting timely treatment that minimizes virus transmission in the community (Jones et al., 2014). The HB (health belief) model elucidates that when people feel susceptible to infectious diseases like the COVID-19 virus, they become involved in health-related behaviors that can have severe health-related consequences. Thus, its advantage to health-related individuals' behavior preponderate the barriers (Castonguay et al., 2016).

GLOBAL HEALTHCARE SYSTEMS AND CRISIS MANAGEMENT

The appearance and recurrence of infectious diseases result in a decline in economic and tourism activities worldwide (Piccinelli et al., 2021). The advent of the COVID-19 outbreak posed pressure on healthcare systems and quickly instigated disruptions to travel and tourism destinations, healthcare systems, and the world economy (Bausch et al., 2020). The ongoing global crisis resulted in numerous problems and crisis management challenges unfolding yet (Farzanegan et al., 2020). This study investigates strategic retorts on self-protective measures on travel and tourism activities to contain the virus's rapid spread and minimize the adverse impacts on mental health and economic losses (Crespí-Cladera et al., 2021). This article primarily focuses on crisis management and disruption in the travel and tourism sector and measures to revive business activities to the next normal (Zenker and Kock, 2020). The study debates that intervention strategy controls the COVID-19 quick spread

with hands-on management of the tourism industry crisis. The support of the respective governments can help revive the economic activities and service sectors, including travel and tourism, by implementing collaborations and the scientific contribution to reset the business industry to a normal situation (Pereira et al., 2020). Managing a crisis and challenging disaster is a thought-provoking and complex theme to address the emerged problems. Crisis management needs to be effectively coordinated through an interdisciplinary and multidisciplinary approach to large-scale institutional, organizational and individual responses to address this critical issue.

Each crisis event offers positive aspects and patrimonial opportunities in perceiving and responding to a global challenge or crisis events. Resilience effectively helps to deal with challenging circumstances and crisis management (Wut et al., 2021). Crisis management in threatening and stimulating conditions provide numerous opportunities in capitalizing on new economic horizons. Thus, enterprises, business experts, policymakers, and decision-makers need to implement reasonable practical and innovative skills and creative, intelligent business plans to handle the crisis positively. Hence, it helps in reviving the travel and tourism industry. It helps explore and proficiently: (1) design and implement crisis management and practical strategies. Still, (2) establishing resilience to resolve and manage the events of future crises (Wong et al., 2021; Wut et al., 2021; Zheng et al., 2021). The current study aims to address these identified gaps and critically review the existing and emerging literature to help university circles, investigators' professionals, and scholars alike to better understand, accomplish and valorize the travel and tourism industry impact and the COVID-19 pandemic affordance setting. Thus, to attain this end, this study discusses how the COVID-19 global challenges urge to design and implement crisis management strategies that might be a transformational opportunity to raise questions about transformational opportunities and recovery strategies associated with the virus circumstances.

CHALLENGES TO TRAVEL AND TOURISM INDUSTRY IN THE WAKE OF A GLOBAL HEALTH CRISIS

The development of the COVID-19 virus has infected people across the globe, affecting almost every region worldwide. Ultimately, in response to this health crisis, many countries and regions imposed border shutdown and travel restrictions to combat the infectious virus's quick transmission. The ongoing pandemic has instigated a significant decline to all segments of the world economy; however the service sector faced a massive hit, including the travel and tourism industry. This industry is the most critical contributor to the organizations of service industry worldwide. The appearance of the COVID-19 virus resulted in a global health crisis and economic crunch and posed a significant decline in the travel and tourism industry. As of March 9, 2021, there were more than 117.989 million confirmed patients of the COVID-19 disease, with more than 2.617 million death toll attributed to the ongoing coronavirus pandemic, making

it the deadliest pandemic in human history. There were more than 93.641 successful recovered patients as of March 9, 2021, worldwide (Wang et al., 2020).

Europe

Europe was the epicenter, and there was a massive struck of the COVID-19 pandemic in many European countries. There was a falling trend in daily new cases in most countries earlier, but many countries are now reporting a rise in the ongoing COVID-19 pandemic. Poland, France, Italy, Germany, and the Czech Republic have recorded the highest number of infected patients in recent weeks. The worst-affected countries imposed border shutdowns and restrictions on social gatherings at public places and tightened preventive measures to combat the disease's quick spread. The rise in the number of infected cases was due to relaxation on restrictions. As of March 13, 2020, the number of new confirmed cases crossed China's total confirmed patients. The World Health Organization instigated considering the European region as the active epicenter of the COVID-19 pandemic. In the first wave, cases by country in the region of Europe had doubled within 3–4 days, with some countries, mostly those states at earlier phases of the virus detection, reported doubling of cases every 2 days. As of March 17, 2020, each country in Europe had reported a confirmed patient of the COVID-19.

As of March 18, 2020, the European countries imposed lockdowns and restrictions on social gatherings, and more than 250 million European people faced lockdowns against COVID-19 protective measures to contain the quick spread. As of March 01, 2021, there were more than 37.75 million confirmed COVID-19 cases across the entire European region since the first confirmed infected patients were reported in France on January 25, 2020 (Aqeel et al., 2021; Shuja et al., 2020). Europe reported almost two million new cases in the week ending November 8, the highest record of confirmed cases in a single week. Since the end of August 2020, Europe reported a distinct rise in the number of newly infected patients. This ongoing global health crisis posed a sharp decline in travel and tourism activities worldwide. The daily new cases of the COVID-19 (based on the 7-Days moving average) as of March 8, 2021 indicated that North America and the U.S. are the most affected countries, and the ongoing pandemic has massively struck in these countries. South America, France, Germany, India, and the United Kingdom are also positively affected by infectious disease. In China, the situation remains under control, as they have successfully contained the spread of the virus in the country. These infections of the pandemic COVID-19 virus has resulted in psychological issues, fear and anxiety among employees of the hospitality and tourism industry.

Global Effects of the COVID-19 Pandemic

As of March 9, 2021, the WHO has confirmed global cases of over 117.99 million infected by the COVID-19 virus. More than 2.62 million deaths were attributed to the COVID-19 pandemic, making it one of the lethal pandemics in human history. The

global preventive measures to the COVID-19 pandemic have resulted in significant disruptions in social, economic, and health systems. It has caused the most significant recession worldwide since the great depression, which began as the most severe economic depression during the 1930s. The ongoing pandemic has led to the cancelation or postponement of economic events, widespread supply chain shortage exacerbated by consumers' panic buying, agricultural disruptions and food items shortage, and low emissions of pollutants and greenhouse gasses. Governments imposed restrictions on face-to-face education and closed partially or fully the public areas and educational institutions to combat the virus damages. The COVID-19 outbreak resulted in an infodemic through mass media and social media platforms. It has shaken public trust, impeded the virus's restraint, and endured the pandemic itself. The emergence of the COVID-19 has raised numerous problems, such as health equity, the balance between individuals' rights and public health imperatives, and racial and geographic discrimination.

Table 1 indicates the cases and mortality ratio of the COVID-19 by most patients in the top affected countries, as of March 9, 2021, worldwide. The WHO statistics reported that the United States had the most number of confirmed cases, 29,038,631 death toll 525,752, and a case-fatality ratio of 1.80% in the world. India is the second most victim of the COVID-19 confirmed patients and reported 11,244,786, with a death toll of 157,930 and a case-fatality rate of 1.40%. Brazil is the third most affected country and declared confirmed 11,051,665 cases, death toll 266,398, and case fatality ratio 2.40%. Russia reported total cases of 4,284,408, deaths 87,985, with a case fatality ratio of 2.10%, and the United Kingdom reported 4,235,989 confirmed patients of the coronavirus, death toll 124,801, with a case fatality rate of 2.90%, correspondingly. See **Figure 1** for details about daily new cases of the COVID-19 of the selected countries and regions based on confirmed cases and the most affected country's mortality rate worldwide. See **Table 1** for further details. The increasing cases and infection of the coronavirus has resulted in psychological issues, fear and anxiety among employees of the hospitality and tourism industry, which resulted in negative impacts on employees performance.

The COVID-19 data indicated that the number of deaths due to daily new cases of the COVID-19 of the selected countries and regions caused challenges. There was a quick rise in the number of patients from March to April 2020, and new patients significantly decreased from May to August 2020. From September 2020 to February 2021, there was a rising trend of new cases worldwide. The number of new cases has sharply decreased, but the pandemic is still growing across the world. Some countries have faced massive spread, while some nations have controlled the infection effectively. The increasing cases and infection of the coronavirus has resulted in psychological issues, fear and anxiety among employees of the hospitality and tourism industry, which resulted in negative impacts on employees performance. Globally, the COVID-19 mortality rate is almost 3.4%, which shows a ratio of the reported confirmed cases has died. By comparison, the seasonal flu usually causes death far fewer than 1% of the infected patients globally—initially, the WHO has mentioned a 2% mortality rate. However,

TABLE 1 | COVID-19: Confirmed infected cases, and mortality ratio (most affected countries) by March 9, 2021.

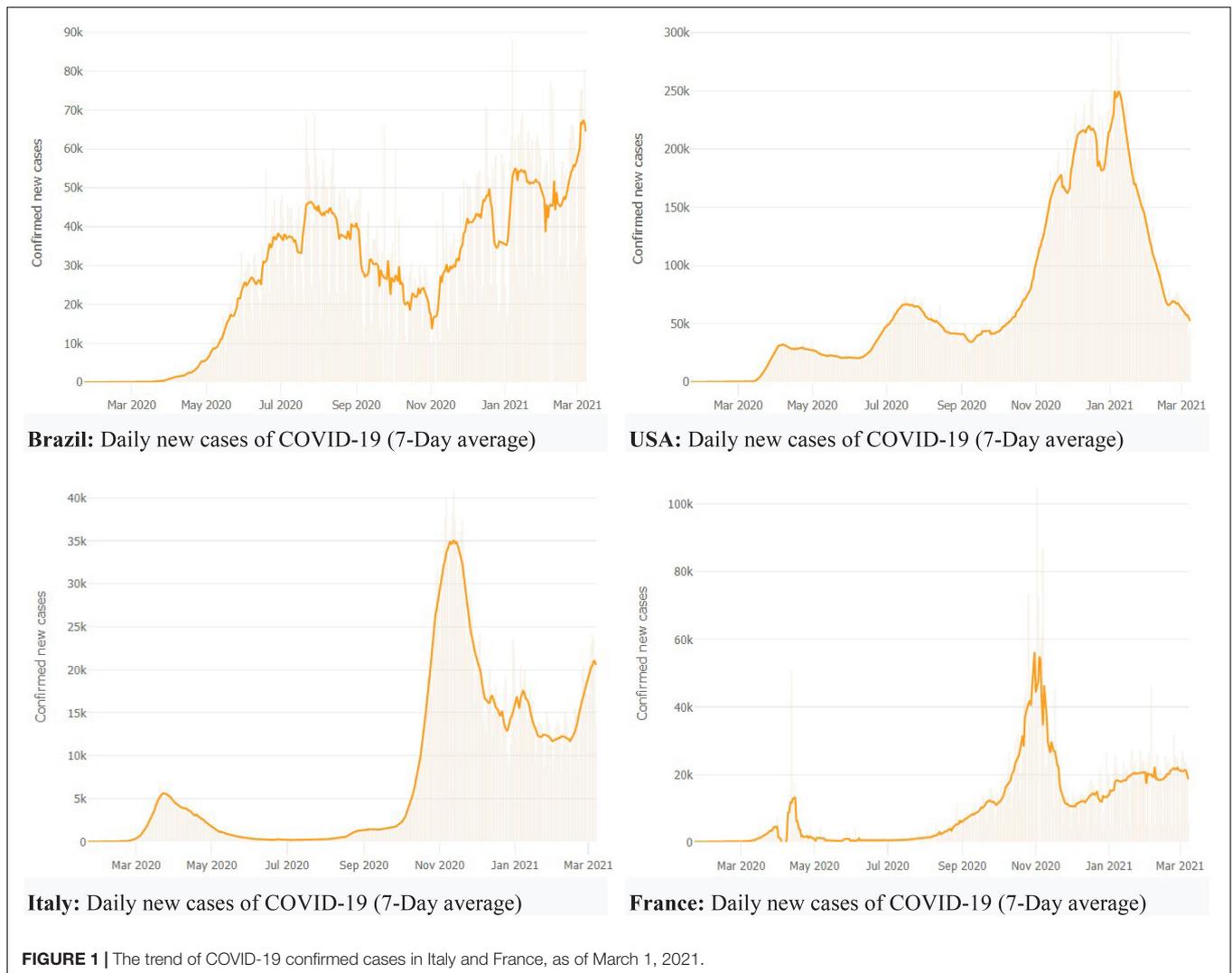
Country	Confirmed	Deaths	Case-fatality%	Deaths/100k pop.
United States	29,038,631	525,752	1.80	160.7
India	11,244,786	157,930	1.40	11.68
Brazil	11,051,665	266,398	2.40	127.18
Russia	4,284,408	87,985	2.10	60.9
United Kingdom	4,235,989	124,801	2.90	187.7
France	3,969,612	89,090	2.20	133
Spain	3,160,970	71,436	2.30	152.89
Italy	3,081,368	100,103	3.20	165.65
Turkey	2,793,632	29,094	1.00	35.34
Germany	2,513,784	72,236	2.90	87.11
Colombia	2,278,861	60,598	2.70	122.05
Argentina	2,154,694	53,121	2.50	119.39
Mexico	2,130,477	190,923	9.00	151.3
Poland	1,801,083	45,317	2.50	119.32
Iran	1,698,005	60,786	3.60	74.31
South Africa	1,521,706	50,803	3.30	87.93
Ukraine	1,455,421	28,616	2.00	64.13
Indonesia	1,386,556	37,547	2.70	14.03
Peru	1,371,176	47,854	3.50	149.59
Czechia	1,325,291	21,882	1.70	205.93
Netherlands	1,139,102	15,990	1.40	92.8
Canada	896,247	22,271	2.50	60.1
Chile	860,533	21,163	2.50	112.99

Source: John Hopkins University CSSE COVID-19 Data.

the WHO specified that the estimation of 2% was much early, and provisional forecasting has been changed over time. Surveillance indicated an increasing trend within China, but it also reported a growing number of infected patients worldwide (D'Amico et al., 2020).

Table 2 specifies the infected cases of the virus with mortality ratio in the countries with the highest number of patients suffering from the COVID-19, as of March 9–10, 2021. Accordingly, WHO declared that the USA remained the country with the highest death toll caused by this lethal virus. The U.S. reported virus-infected cases of, 29,038,631 deaths, 525,752, and CFR (case-fatality ratio) 1.80%. Similarly, Brazil remained the second country with the highest death toll and reported total infected people of 11,051,665, a death toll of 266,398, and a CFR of 2.40%. Data showed the third-highest infected country was Mexico. They reported 2,130,477 infected patients, with total deaths of 190,923 and CFR of 9.00%. In comparison, India is the fourth nation with the reported patients. They reported the highest recorded deaths caused by this viral disease (COVID-19).

India reported 11,244,786 patients with virus infection, 157,930 deaths, and a CFR of 1.40%. The fifth highest victim of the virus was the UK. They declared infected patients 4,235,989 who had suffered from the COVID-19. There total deaths 124,801, and a CFR of 2.90%. Accordingly, Russia reported total viral infections of 4,284,408, total deaths 87,985, and CFR of 2.10%. France had shown actual confirmed patients of 3,969,612, with a death toll of 89,090 and a case fatality rate



of 2.20%. Germany reported 2,513,784 established virus-infected patients of COVID-19 disease, with total deaths of 72,236 and a corresponding case fatality ratio of 2.90%. **Figure 1** shows the trend of the COVID-19 confirmed cases in some countries, including Italy and France, as of March 1, 2020.

Figure 1 specifies that Brazil has indicated a rising trend as they reported new infected patients' cases on a 7-day average. The number of daily cases has decreased in the U.S. after January 2021. France has shown an increasing trend in recording daily new patients, and Italy has faced a rise in new cases in February 2021. Many countries face second and third viral disease waves of the pandemic worldwide. Europe remained the epicenter of this virus, and there were around 38 million cases of the virus. The global arrival of COVID-19 has caused substantial disruption to the service industry, including the travel and tourism sector, as the hospitality industry is a significant contributor to the global GDP.

The global COVID-19 health crisis has massively disrupted global economies and posed substantial damage to the hospitality

industry, mainly travel and tourism firms encounter abnormal environment worldwide. The UN World's Tourism Organization estimates that international visitors declined by 60–80 percent by the end of 2020. The consequences results showed potential economic damages of \$0.9–1.20 trillion for the global tourism industry. Many resorts and cities reported an 80–90 percent drop in planned travel and tourism. Travel restrictions on tourists are conflicting and unilateral, and many global tourist attractions, such as amusement parks, sports venues, and museums, are under restrictions. UNWTO stipulates that the number of international visitors will fall by 65% in the first half of 2020. Air passenger travel reports are down more than 60% globally.

Table 3 specifies that Yemen recorded the highest rate of CFR = 25.0% with 2677 infected patients of COVID-19. Yemen showed a 667 death toll. The number of deaths per 100K population remained 2.34, as of March 12, 2021. Mexico has reported the second-highest rate of CFR = 9%. There are 2,150,955 confirmed infected patients with a death toll of 193,152,

TABLE 2 | Cases with COVID-19's mortality rate (Deaths), by March 9, 2021.

Country	Confirmed	Deaths	Case-fatality%	Deaths/100k pop.
United States	29,038,631	525,752	1.80	160.7
Brazil	11,051,665	266,398	2.40	127.18
Mexico	2,130,477	190,923	9.00	151.3
India	11,244,786	157,930	1.40	11.68
United Kingdom	4,235,989	124,801	2.90	187.7
Italy	3,081,368	100,103	3.20	165.65
France	3,969,612	89,090	2.20	133
Russia	4,284,408	87,985	2.10	60.9
Germany	2,513,784	72,236	2.90	87.11
Spain	3,160,970	71,436	2.30	152.89
Iran	1,698,005	60,786	3.60	74.31
Colombia	2,278,861	60,598	2.70	122.05
Argentina	2,154,694	53,121	2.50	119.39
South Africa	1,521,706	50,803	3.30	87.93
Peru	1,371,176	47,854	3.50	149.59
Poland	1,801,083	45,317	2.50	119.32
Indonesia	1,386,556	37,547	2.70	14.03
Turkey	2,793,632	29,094	1.00	35.34
Ukraine	1,455,421	28,616	2.00	64.13
Belgium	789,008	22,292	2.80	195.17
Canada	896,247	22,271	2.50	60.1
Czechia	1,325,291	21,882	1.70	205.93
Chile	860,533	21,163	2.50	112.99

Source: John Hopkins University CSSE COVID-19 Data.

and per 100K population, deaths are 153.06. Syria reported a CFR ratio (6.7%), and Sudan reported ratio (CFR = 6.3%).

Table 3 explains the spread of lethal virus infection and mortality (CFR) ratio. The data reports the high victim countries with COVID-19 patients. Yemen remains the most affected country with 2.5%. **Table 3** shows 2,667 virus-infected sick patients with 667 deaths. **Table 3** reveals the number of deaths/per 100,000 is 2.34 by March 12, 2021.

Table 4 indicates the infected patients with COVID-19 positive scenario worldwide. Showing the transmission, new cases, total deaths, overall recoveries worldwide. **Table 4** designates a detailed COVID-19's analysis with its global spread, recoveries, total deaths, and serious/critical COVID-19 patients as of October 09, 2021. The current COVID-19 virus has caused domestic, regional and global health issues worldwide (Aman et al., 2021; Aqeel et al., 2021; Azadi et al., 2021; Local Burden of Disease HIVEC, 2021; Paulson et al., 2021; Soroush et al., 2021; Wang et al., 2021).

RISK PERCEPTION AND CRISIS MANAGEMENT AMID COVID-19 PANDEMIC

The opinion of travel and tourism research scholars about tourism and crisis falls into two contexts: perception of risks at individuals' level on tourism travel demand and crisis management developed by the lethal viral disease COVID-19 at

the collective levels, such as supply side. Besides, research on the perceived risk perception related to hospitality sectors, including travel and tourism industry focuses on travelers' viewpoints rather than considering destination communities' views. The notion of perceived risks in tourism is linked primarily with consumer behavior research (Fu et al., 2021; Im et al., 2021; Ma et al., 2021). Scholars have examined safety and risk perception issues, typically from tourists' perspectives, and have looked for the logic as to why tourists perceive risk factors differently. What types of elements impact travelers' risk perception (Lepp and Gibson, 2003; Gössling et al., 2012; Wang et al., 2019). Tourism-related risk perception may indicate an association with abnormal circumstances, such as war, terrorism, social instability, political, criminal, or health-related public concerns. Perceived risks or anxiety can influence tourists to avoid specific regions or cities. Still, travelers might drop visiting such places due to past unpleasant experiences, novelty-seeking behaviors (Sharifpour et al., 2014; Wong et al., 2014; García-Villaverde et al., 2021; Halder and Sarda, 2021), or their cultural orientations (Reisinger and Mavondo, 2006; Cuomo et al., 2021). From the perspective of the tourism supply side, the previous studies on the travel and tourism industry have taken crises and pandemics as a dominant theme, as it affects tourists' psychology and mental health at a large scale worldwide. The existing research studies have focused on examining the effects on tourism demand during various global crises, such as the September 11 attacks on the U.S. in 2001, earthquakes, other terrorist activities (Seabra et al., 2020),

TABLE 3 | COVID-19: cases and mortality (Case-Fatality Ratio) by the most affected countries.

Country	Confirmed	Deaths	Case-fatality%	Deaths/100k pop.
Yemen	2,667	667	25.0	2.34
Mexico	2,150,955	193,152	9.0	153.06
Syria	16,257	1,085	6.7	6.42
Sudan	30,686	1,940	6.3	4.64
Egypt	189,000	11,169	5.9	11.35
Ecuador	297,957	16,128	5.4	94.40
China	101,225	4,839	4.8	0.35
Bolivia	257,240	11,903	4.6	104.84
Afghanistan	55,917	2,451	4.4	6.59
Liberia	2,026	85	4.2	1.76
Bulgaria	272,700	11,094	4.1	157.94
Zimbabwe	36,377	1,492	4.1	10.33
Mali	8,782	359	4.1	1.88
Tanzania	509	21	4.1	0.04
Comoros	3,615	146	4.0	17.54
Bosnia and H.*	140,990	5,410	3.8	162.76
Eswatini	17,215	659	3.8	58.00
Somalia	8,820	338	3.8	2.25
Niger	4,853	180	3.7	0.80
Guatemala	181,143	6,531	3.6	37.87
Chad	4,246	151	3.6	0.98
Peru	1,387,457	48,323	3.5	151.06
Iran	1,723,470	61,016	3.5	74.59

John Hopkins University CSSE COVID-19 Data. *Bosnia and Herzegovina.

TABLE 4 | COVID-19 infected cases in top 20 countries worldwide, as of October 09, 2021.

Country,	Total	New	Total	New	Total	New	Serious,	Total	Tests/	Population
other	cases	cases	deaths	deaths	recovered	recovered	critical	tests	1M pop	
World	237,979,622	450,499	4,856,844	7,666	215,119,880	448,807	83,334			
1 United States	45,136,852	107,097	732,477	1,937	34,577,516	98,385	17,497	656,553,737	1,968,860	333,468,970
2 India	33,934,335	19,870	450,408	248	33,240,703	23,066	8,944	580,043,190	415,136	1,397,235,287
3 Brazil	21,550,730	18,172	600,493	628	20,665,273	58,917	8,318	63,776,166	297,354	214,479,029
4 United Kingdom	8,085,109	41,024	137,564	147	6,593,525	32,842	808	311,519,071	4,558,427	68,339,166
5 Russia	7,717,356	27,246	214,485	936	6,819,796	20,566	2,300	195,600,000	1,339,597	146,014,021
6 Turkey	7,387,537	30,201	65,778	188	6,843,487	28,167	633	89,154,839	1,042,851	85,491,480
7 France	7,047,786	4,470	117,029	38	6,832,528	7,380	1,200	146,046,715	2,231,182	65,457,114
8 Iran	5,683,980	9,897	122,197	185	5,186,096	16,097	5,451	32,619,228	382,147	85,357,709
9 Argentina	5,265,058	753	115,444	28	5,130,084	1,450	981	24,252,818	530,435	45,722,524
10 Spain	4,973,619	2,309	86,778	77	4,800,693	3,190	550	65,473,038	1,399,660	46,777,803
11 Colombia	4,969,131	1,607	126,552	35	4,812,120	1,808	342	25,895,959	502,136	51,571,586
12 Italy	4,695,290	3,022	131,228	30	4,478,137	4,234	383	94,716,158	1,569,480	60,348,769
13 Germany	4,316,499	9,742	94,988	78	4,074,300	9,700	1,336	73,348,901	871,909	84,124,457
14 Indonesia	4,225,871	1,384	142,560	66	4,057,760	3,514		41,116,704	148,331	277,196,503
15 Mexico	3,707,234	7,613	281,121	514	3,063,722	6,012	4,798	10,838,697	82,958	130,652,960
16 Poland	2,918,862	1,894	75,835	32	2,666,589	760	203	21,204,795	561,064	37,793,902
17 South Africa	2,910,681	924	88,236	132	2,789,432	1,302	546	17,931,034	297,571	60,257,979
18 Philippines	2,643,440	10,616	39,232	191	2,485,858	7,490	3,194	21,657,259	194,353	111,432,443
19 Ukraine	2,514,005	16,362	58,081	241	2,282,482	4,720	177	13,164,600	303,335	43,399,511
20 Malaysia	2,323,478	9,751	27,191	78	2,170,289	12,724	792	31,182,322	948,009	32,892,425

Source: WHO and CSSE COVID-19 cases details by JHU Data. The yellow text color indicates new infected cases and the red text color illustrates new deaths.

the severe acute respiratory syndrome (SARS) outbreak in 2003 (Wang, 2009), and the swine flu (H1N1) pandemic in 2009 and the global economic crisis from 2007 to 2008 (Page et al., 2011), tourists boycotts and the COVID-19 outbreak (Yu et al., 2020).

Another study explored the swine flu impact on destination planning by considering perceived risks through media coverage on influenza outbreaks (Page et al., 2011). Nevertheless, Ritchie and Jiang (2019) reviewed 142 published studies related to travel and tourism crisis management. They identified responses and recovery strategies, preventive measures of crisis and planning practices, a lack of in-depth theoretical and methodological evaluations of crises in the travel and tourism industry (Ritchie and Jiang, 2019). Some researchers emphasize that crisis management in the tourism industry should consider destination residents' welfare. With the expansion of industry-related infrastructure, the speedy growth of the tourism sector has posed environmental crises in some destination cities and regions (Lukashina et al., 1996; Ma et al., 2020; Lee and Chen, 2021). The literature documents that tourist destination residents are aware of tourism activities' positive economic contribution and other associated adverse socio-environmental risk factors affecting local communities' livelihood (Schmidt et al., 2014; Bires and Raj, 2020; Pham, 2020). However, risk perception and reactions differ among various clusters of destination residents (Antunes et al., 2020). Easterling (2004), Scott and Laws (2006), Abbas (2020b), Mubeen et al. (2021a), Aman et al. (2022), and Mamirkulova et al. (2022) paid precise attention to identifying destination residents' interests and their representatives to manage a tourist place, including tourism crisis management (Easterling, 2004;

Cartier and Taylor, 2020; McCabe and Qiao, 2020). Eitzinger and Wiedemann (2007) emphasized investigating residents' risk perception because their understandings are based on their specific experiences that differ from tourist destinations. With the appearance of the COVID-19 global crisis, more than 200 territories and countries governments have shut down borders and imposed unprecedented restrictions on social gatherings, movements (Yang et al., 2020). This pandemic has changed their populations' behavior, and economic activities have decreased enormously worldwide. Besides, tourists' health risks have increased the concern that infected tourists can spread the lethal infectious disease to destination residents and communities (Gautret et al., 2012). In the emergence of a global pandemic, international travel spreads infectious disease quickly and brings health-related threats to populated urban areas worldwide (Ritchie and Jiang, 2019; Zheng et al., 2021). Travel within communities increases higher risks of transmission of the COVID-19 fatal illness and other respiratory viruses, such as seasonal influenza (MacIntyre, 2020).

COVID-19 SETTINGS, TRAVEL, AND TOURISM INDUSTRY: CHALLENGES AND RECOVERY STRATEGIES

Scholars have focused on investigating, gauging, and predicting the consequences of coronavirus on the tourism sector is vital to eliminate health risks, formulate, monitor, and improve responsive strategies. However, research concentrating on the

characteristics and effects of crises rather than their structural roots often obscures and stabilizes the conditions and inevitable social structures under which crises arise (Barrios, 2017). Examining the actual root causes of the COVID-19 impact can last longer to cross the tourism and leisure research boundaries and scope. However, the latter needs further investigation and challenge the “environment” and structure of tourism, enabling and sometimes accelerating the global spread of COVID-19. Deplorably, economists restrain the idea that the pandemic stems purely from natural events outside the economic system (Nowlin, 2017). However, considering COVID-19 as an external shock and phenomenon unrelated to the structure of socio-economic factors and values can continue and strengthen the virus roots of the post-COVID-19 era and limit the process of change and transformation. The coronavirus pandemic is the global crisis that is associated with economized societies having roots in growth patterns. Tourism requires traveling, travel and leisure growth patterns, and evaluation are the major contributors to current socio-economic systems that accelerate the quick spread and further consequences of the lethal virus. Tourism industry stands responsible for a highly interconnected worldwide, waste and climate change, pollution, national, international, regional economic growth, capitalism superiority values and economic activities decision-making, and policymaking and politics formulation. The increasing growth in climate change is responsible for more outbreaks; epidemics and pandemics are more commonly expected in the future, highlighting a vicious circle of forces and interwoven nature between physical, biological, and socio-economic systems (Sands, 2019).

Besides, economic systems and mindsets have contributed to the ongoing pandemic and kept guiding and shaping responses and recovery strategies tailored by people, business houses, institutions, and governments. Economic priorities to maintain business stability, jobs, revival, and recovery to the old average economic growth are the main agenda and driving business professionals, policymakers, practitioners, and governments. For instance, financial support with tax relief and subsidies to tourism companies and employees. Scholars have debated on relaxing restrictions to reopen and re-start economic activities at the cost of the second and third wave of the pandemic COVID-19 to increase human lives' risks. Similarly, people have started to panic buying and consumption through online buying experiences, such as traveling, drinking, dining, and virtual entertainment. The lockdowns demonstrate public preference, persistence, and fear of losing traditional lifestyle and consumerism deemed fit for their happiness and success. The research on COVID-19 tourism reinforces similar mindsets. Scholars have investigated the economic effects of COVID-19 on the tourism industry and traded them off to socio-cultural, biological, and socio-economic impacts. Research focusing on measuring and predicting when tourism will revive and tourists start traveling like a normal situation before and when we can achieve the old traditional targets. Globally, governments are trying to manage the crisis to avoid economic losses on a large scale. They are determined to become first in reopening borders and business activities, including travel and tourism. Financial markets, cash liquidity, and economic survival equally press multinational companies

and small tourism firms. They also look forward to receiving help to resume their business operations on the old patterns and business models. Discussion and research rely on trading between financial advantages and economic losses in exchange for morals, humanoid lives, human rights, and ethics.

In general, research, our education, socio-economic and political systems, which shape and each other, frame our mindset on how to conduct research, measurement, understanding, response, and recovery from the COVID-19 global crisis. Subsequently, we have transformed the COVID-19 outbreak from the spread of biological viruses to the financial crisis contagion. We have recently initiated an economic revival race to rebuild the old model based on financial competitiveness. Tourism and leisure research should undertake more responsibility to inform, drive and lead sustainable features to avoid such kinds of perpetuations. To this end, COVID-19 tourism and leisure industry research should not be seen, executed, directed, and used solely as a helpful tool to help restore the traditional old business models. On the contrary, COVID-19 tourism and leisure research should also set challenges to business growth models and assumptions, which have led to existing circumstances and enabled our business phenomena to reimagine and reset the travel and tourism industry to gain the next normal. It is helpful in capitalizing opportunities in the crisis for escaping the unsuitable truism-paradigms paths (Gössling et al., 2020; Hall et al., 2020; Higgins-Desbiolles, 2020; Ioannides and Gyimóthy, 2020). The covid-19 travel, tourism, and leisure research need to assume responsibility on criticism to epistemic and ontological basics, practicalities, and assumptions, which helps underpin the prevailing scientific and technological growth paradigms (Brodbeck, 2019). It should also analyze and challenge mechanisms, patterns, and systems, which help sustain the evolution of deleterious and unsustainable tourism (Higgins-Desbiolles, 2020). However, in order to restore and transform the travel and tourism industry, its social and economic system, tourism research should assume responsibility to find ways, support, and perspectives of research, knowledge, awareness, and development. COVID-19 tourism research should also stimulate, motivate and inform all tourism stakeholders to adopt new ways of existing, doing things, and politicalizing to regain the old successful business growth models.

INDISPENSABLE ROLE OF TECHNOLOGY IN COMBATING COVID-19 PANDEMIC

Technological applications and Social media platforms have played an indispensable role in fostering economic growth. In the advent of the global health and financial crises, technology remains at the front to provide the core of solutions to combat the adverse of the COVID-19 on international economic activities, including the leisure and tourism industry. Technological innovations have played an essential role in healthcare systems to treat patients. It helps reopen the world economy and tourism sectors, such as social distancing, crowd controlling technologies, prominent big-data use for quick

and real-time managerial decision making, identity controls, and digital health passports. It is useful to seeking peer support and health-related information through social media, human robots delivery system materials, robotized-AI touchless mechanism of service delivery, neutering and disinfecting public spaces, measuring and detecting human body temperature, and proving security and safety measures. In the time of the global pandemic, technology offers endless support, such as panacea to human-driven needs for normalizing surveillance under the COVID-19 circumstances to precise and safeguard the safety of human health, to gather information, and analyze personal data for timely decision-making. Though the COVID-19 travel and tourism research cannot prevent technology advancements, it should combat this technological Trojan horse from within to ask questions and resetting its drive, design, formulation, affordance, and ethics interpretation and applications. Technology is made up of a unique affordance, and its development and expression are determined by the institutional logic of design, implementation, and use of technological knowledge (Zuboff, 2015).

The coronavirus Tourism research can merely explore and advance COVID-19 information and technical capabilities to gather, examine, and use big data sets. It helps to understand better, predict, control, and modify human behavior, such as that of tourists and employees, thereby generating revenue, economic growth, and market control (Zuboff, 2015). However, such research-based on the tourism industry will only further support producing the daily data, which imprints the main objectives of the internal components of organizational and institutional life and the commercialization strategy. Technology has always played a role as an enabler, a catalyst for change and innovation, a disruptor of the travel and tourism industry, and a tool for building tourism resilience in the global crisis. In the advent of the COVID-19 pandemic, the crisis strengthens the role of technology in tourism recovery and reimagining while reinforcing the existing paradigms in the evolution of e-tourism. Trends and the espousal of smart tourism destinations and travel services, artificial intelligence, digital advances, and robotics are now accelerating in combating COVID-19 tourism implications. The research of COVID-19 tourism should assume responsibility in reimagining and reshaping the travel purpose, use, and means of these technological advancements, which have primarily shaped how our societies and global economies are transforming and how tourism activities are being implemented, managed, and developed with the help of COVID-19 crisis (Constantiou and Kallinikos, 2015).

DISCUSSION AND CONCLUSION

The COVID-19 pandemic resulted in long-lasting economic, socio-cultural, and adverse psychological consequences on different stakeholders. Scholars feared that some impacts of the pandemic would stay for several years ahead. This study primarily aims to encourage and motivate the tourism and leisure industry scholars to analyze and assume responsibility to consider the COVID-19 pandemic as the transformational

opportunity for crisis management. They need to reform their minds to design and conduct research. Technological innovations are helpful to handle the global crisis, and tourism institutions should reset and redesign their metrics and standards to motivate and evaluate the research purpose, role, and consequences related to tourism and the leisure industry. Besides, crises create opportunities to accelerating technological advancements, changes, and innovation. Technological advances, tools, and social media use play a vital role in driving economic stability and growth. In the digital health and financial crisis contexts, technology applications are forefront to address the undesirable COVID-19 impacts on business activities, such as travel, leisure, and tourism. Technological innovation and advancements are essential in the global health care systems to treat patients. Technology supports to reopen the world economy and tourism industry, for instance, social alienation, crowd control technologies, prominent big data use for rapid and real-time management decision-making, identity control, and digital health passports (Colombo et al., 2016). Although, these preventive measures are helpful to combat the COVID-19 tourism impacts. They are not inevitable and unquestionable to reshape and reallocate humans' actual needs and purposeful values. Scholars should assume the responsibility to safeguard that COVID-19 tourism research ensures the latter.

The study findings can inspire travel and tourism firms to monitor, understand, and manage the crisis evolution scenarios and execute preventive anti-COVID-19 pandemic strategies to strive for the tourism industry revival to the next normal and revitalization. The tourism research practitioners and managers can adopt the COVID-19 crisis management framework to manage tourists' mental health-related catastrophes in broader contexts that enhance the study findings' generalizability. The travel and tourism industry in China became the first victim of the COVID-19 pandemic ramifications. They adopted timely preventive safety measures to contain and reduce the economic losses and implemented safeguard policies to secure tourists and employees. The tourism industry implemented social responsibilities, participated in anti-pandemic campaigns during social gathering restrictions, and elongated lockdown. After witnessing recoveries and positive signs, the travel and tourism industry adopted a series of health guidelines and innovative measures to revitalize its performance. However, the COVID-19 tourism ramifications remain uncertain as the leisure industry's economic crisis is existentially intimidating.

Crisis management strengthens the tourism and leisure industry and aims to examine: (1) designing and implementing global crisis and hands-on strategies. Besides, (2) to establish resilience in resolving and managing the crisis events for future pandemics (Wong et al., 2021; Wut et al., 2021; Zheng et al., 2021). This study aimed to address the recognized literature gaps and critically review the existing and emerging literature to help university circles, investigators' professionals, and scholars alike to better understand, accomplish and valorize the travel and tourism industry impact and the COVID-19 pandemic affordance setting. Thus, to attain this end, this study discusses how the COVID-19 global challenges urge to design and implement crisis management strategies that might

be a transformational opportunity to raise questions about transformational opportunities and recovery strategies associated with the circumstances of the coronavirus pandemic. This study aims to recognize fundamental values, enterprises, and pre-assumptions unified with the travel and leisure industry. It helps revive tourism, academia, and researchers to bring breakthroughs in introducing frontier areas of practical research. The present article debated the actual impacts of the next phase, visitor behavior, and experience. The travel and tourism industry's principal shareholders include tourism demands and enterprises' that organize tourist places and decision-makers. They have response experiences, rehabilitation, and relocation of tourism events.

This article offers helpful awareness of COVID-19 effects on tourism and the practical vitalizing to tourism research. The study steps forward to discuss significant COVID-19 tourism impacts, public behaviors, understandings, experiences that major tourism stakeholders (tourism demand, supply, and firms or enterprises managing tourist destinations and policymakers) have experienced during the pandemic appearance. The study analysis provides an insightful understanding and overview of the impacts of the coronavirus on the tourism industry. Besides, the study describes the paths that are helpful for academic, researchers, and stakeholders to understand better, respond or behave in the phenomena of the global crisis and reshape, form, and reset the next new normal successful business models in the advent of the pandemic and the era of post-COVID-19. The study discusses responses to the call for the opportunities of transformational research, which develops rationales based on critical discussions that tourism and leisure industry research should conduct further investigations to replicate and reconfirm the general knowledge within the contexts of a pandemic. Instead, the COVID-19 research ought to seek new patterns and pursue novel ways to share information and guidance for tourism futures. The study aims to offer practical, real-time, and theoretical implications on conducting future research in managing, understanding, and transformative valorize the ongoing COVID-19 tourism effects.

This study provides valuable practical insights and helpful implications amid the challenging situation of the COVID-19 crisis. The study offers practical suggestions to manage the employees coping behavior and mental stress. Managers and supervisors employed with tourism and hospitality organizations should focus on employees' emotions, fear, and anxiety to take safety measures to prevent negative emotions and health behavior at the workplace. The managers of tourism firms should provide employees with clear safety instructions about the transmission of the COVID-19 virus that can help decrease the fear of the virus transmission. The supervisors and management must control employees' emotions, psychological stress, and anxiety of the COVID-19 spread through various learning programs, social support, medical insurance plans, and skill training (Sheldon and King, 2001). The firms operating in the tourism industry need to develop a safer and more relaxed working environments for the staff. Social security and encouraging an emotional state of mind contribute to productivity, which develops skills among employees. Hospitality firms' employees' satisfaction helps use

firms' resources for business growth, leading to profitability and better operational performance (Mafini and Poee David, 2013; Tengilimoglu et al., 2021; Zhang et al., 2021).

The study findings deliver helpful and practical suggestions for economic recovery and tourism revival by stimulating stimulus-response and preventive protocols and measurements during and after the pandemic (COVID-19) virus. Thus, social cost, and relief packages in combating the pandemic should be designed to help the society at a large scale in tourist cities, regions, and destinations, which have suffered significantly and experienced adverse socio-economic influences because of the ongoing pandemic. Conformist policy measures might not be able to manage and overcome the global economic crisis, as this disaster has intensely changed public perception of the risks related to public health concerns associated with travel and tourism. The evidence from China has shown that the tourism industry has initiated partially to regain the momentum in leisure destinations closer to tourists' homes. Globally, during the weekends, some people have started traveling to closer destinations, but it is still not applicable to main cities at large. The policymakers and decision-makers should formulate recovery strategies with an innovative and holistic mindset rather than just focusing on narrow and direct travel and tourism recovery strategies that were the earlier approaches adopted by many destinations organizing bodies after MERS and SARS. Yang et al. (2020) debated that governments should formulate welfare policies and economic relief packages to respond to adverse consequences of the COVID-19 pandemic. The decision-makers should design packages by allocating financial support across all business sectors, particularly the health, travel, and leisure industry, to ensure a balanced recovery of the affected cities, regions, and residents' destinations.

This article has critically analyzed the prevailing phenomena of the COVID-19 era and specified some limitations, like any behavioral sciences studies. Nonetheless, this present study has not detracted broader standing to manage and implement protective measures, such as monitoring and executing preventive strategies that help reduce the quick transmission of the infectious disease. Thus, the study's limitations lie in the lack of experimental or clinical exploration. The results related to the coronavirus pandemic are unpredictable. Additionally, future tourism research studies can incorporate empirical data using a cross-sectional research design to add various swaying elements to explore tourists' mental health wellbeing. This current research findings provide contributions to scientific knowledge with a broader discourse aiming at tourists' fears and psychological disorders associated with the pandemic. The COVID-19 pandemic is still leading to psychological issues in the masses under the prevailing global health crisis. This research has not created, delivered, or proposed probable new interventional practical strategies and public health policies that minimize tourists' mental health toll during and after the COVID-19 tourism impacts on the global health crisis and beyond. Hence, upcoming researches should assume the responsibility to incorporate more accurate predictive research models and methods. Surveys about tourists and organizers of the tourism destinations related to post COVID-19 pandemic

impacts and travel willingness and leisure products consumption preferences would help practitioners, the academic world, policymakers, and decision-makers foresee the rehabilitated services delivery ecosystem.

There are possibilities of deterioration in the performance of business firms; however, the travel and tourism industry has faced product market competition in the turbulent environment amid the COVID-19 crisis (Liu et al., 2021; Mubeen et al., 2021a,b; Ge et al., 2022). The hotels providing quarantine stations service have experienced a significant decline. More demands for hospital and healthcare center extensions and more dormitories for medical crew to handle the pandemic burden are required. The development of the COVID-19 virus has resulted in an abrupt corrosion in travel and tourism as tourists have had a negative association with the destinations due to their unpleasant experiences about the pandemic horror, suffering, shock, and stories of death. The leisure industry's performance can boost when corporate social responsibility practices are implemented in the industry during and after the global crisis times. Researchers, the academic world, and practitioners can assume the responsibility to conduct longitudinal studies to examine the leisure industry's performance and explore whether travel and tourism have improved through better innovative marketing strategies. The increasing cases and infection of the coronavirus posed various psychological challenges, fear and anxiety among tourists as

well as employees of the hospitality and tourism industry that caused negative impacts on employees performance. The future research may empirically explore technology adoption impacts on the experiences of the tourists, customers, and destination residents' participation, loyalty, satisfaction, and hotel brands performance during and after the post-COVID-19 pandemic era. Besides, adopting technology innovation can produce beneficial results to explore the live streaming advantages. Future studies can also explore the post-pandemic impacts and strategies of hotel mergers, acquisitions, and franchise deals to reduce the adverse effects of COVID-19 on tourism. It can help revive the economic activities to bring the next normal to boost economic growth.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

REFERENCES

- Abbas, J. (2020a). The impact of coronavirus (SARS-CoV2) epidemic on individuals mental health: the protective measures of pakistan in managing and sustaining transmissible disease. *Psychiatr. Danub.* 32, 472–477. doi: 10.24869/psyd.2020.472
- Abbas, J. (2020b). The role of interventions to manage and reduce Covid-19 mortality rate of the COVID-19 patients worldwide. *Found. Univ. J. Psychol.* 4, 33–36.
- Abbas, J. (2021). Crisis management, transnational healthcare challenges and opportunities: the intersection of COVID-19 pandemic and global mental health. *Res. Glob.* 3:100037. doi: 10.1016/j.resglo.2021.100037
- Abbas, J., Aman, J., Nurunnabi, M., and Bano, S. (2019). The impact of social media on learning behavior for sustainable education: evidence of students from selected Universities in Pakistan. *Sustainability* 11:1683. doi: 10.3390/su11061683
- Abbas, J., Wang, D., Su, Z., and Ziapour, A. (2021). The role of social media in the advent of COVID-19 pandemic: crisis management, mental health challenges and implications. *Risk Manag. Healthc. Policy* 14, 1917–1932. doi: 10.2147/rmhp.S284313
- Abbott, A. (2021). COVID's mental-health toll: how scientists are tracking a surge in depression. *Nature* 590, 194–195. doi: 10.1038/d41586-021-00175-z
- Acter, T., Uddin, N., Das, J., Akhter, A., Choudhury, T. R., and Kim, S. (2020). Evolution of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) as coronavirus disease 2019 (COVID-19) pandemic: a global health emergency. *Sci. Total Environ.* 730:138996.
- Agarwal, A., Ranjan, P., Rohilla, P., Saikaustubh, Y., Sahu, A., Dwivedi, S. N., et al. (2021). Development and validation of a questionnaire to assess preventive practices against COVID-19 pandemic in the general population. *Prev. Med. Rep.* 22:101339. doi: 10.1016/j.pmedr.2021.101339
- Aguiar-Quintana, T., Nguyen, T. H. H., Araujo-Cabrera, Y., and Sanabria-Díaz, J. M. (2021). Do job insecurity, anxiety and depression caused by the COVID-19 pandemic influence hotel employees' self-rated task performance? The moderating role of employee resilience. *Int. J. Hosp. Manag.* 94:102868. doi: 10.1016/j.ijhm.2021.102868
- Aleta, A., Hu, Q., Ye, J., Ji, P., and Moreno, Y. (2020). A data-driven assessment of early travel restrictions related to the spreading of the novel COVID-19 within mainland China. *Chaos Solitons Fractals* 139:110068. doi: 10.1016/j.chaos.2020.110068
- Aliperti, G., Sandholz, S., Hagenlocher, M., Rizzi, F., Frey, M., and Garschagen, M. (2019). Tourism, crisis, disaster: an interdisciplinary approach. *Ann. Tourism Res.* 79:102808. doi: 10.1016/j.annals.2019.102808
- Aman, J., Abbas, J., and Shi, G. (2022). Community wellbeing under China-Pakistan economic corridor: role of social, economic, cultural, and educational factors in improving residents' quality of life. *Front. Psychol.* 12:816592. doi: 10.3389/fpsyg.2021.816592
- Aman, J., Abbas, J., Lela, U., and Shi, G. (2021). Religious affiliation, daily spirituals, and private religious factors promote marital commitment among married couples: does religiosity help people amid the COVID-19 crisis? *Front. Psychol.* 12:657400. doi: 10.3389/fpsyg.2021.657400
- Aman, J., Abbas, J., Mahmood, S., Nurunnabi, M., and Bano, S. (2019). The influence of islamic religiosity on the perceived socio-cultural impact of sustainable tourism development in pakistan: a structural equation modeling approach. *Sustainability* 11:3039.
- Antunes, B., March, H., and Connolly, J. J. T. (2020). Spatializing gentrification in situ: a critical cartography of resident perceptions of neighbourhood change in Vallcarca, Barcelona. *Cities* 97:102521. doi: 10.1016/j.cities.2019.102521
- Aqeel, M., Abbas, J., Shuja, K. H., Rehna, T., Ziapour, A., Yousof, I., et al. (2021). The influence of illness perception, anxiety and depression disorders on students mental health during COVID-19 outbreak in Pakistan: a Web-based cross-sectional survey. *Int. J. Hum. Rights Healthc.* 15, 17–30. doi: 10.1108/ijhrh-10-2020-0095
- Aqeel, M., Rehna, T., Shuja, K. H., and Abbas, J. (2022). Comparison of students' mental wellbeing, anxiety, depression, and quality of life during COVID-19's full and partial (smart) lockdowns: a follow-up study at a five-month interval. *Front. Psychiatry* 12:828040. doi: 10.3389/fpsyg.2022.828040
- Arbulú, I., Razumova, M., Rey-Maqueieira, J., and Sastre, F. (2021). Can domestic tourism relieve the COVID-19 tourist industry crisis? The case of Spain. *J. Destination Mark. Manag.* 20:100568. doi: 10.1016/j.jdmm.2021.100568

- Azadi, N. A., Ziapour, A., Lebni, J. Y., Irandoost, S. F., Abbas, J., and Chaboksavar, F. (2021). The effect of education based on health belief model on promoting preventive behaviors of hypertensive disease in staff of the Iran University of Medical Sciences. *Arch. Public Health Arch. Belges Sante Publique* 79:69. doi: 10.1186/s13690-021-00594-4
- Barrios, R. E. (2017). What does catastrophe reveal for whom? The anthropology of crises and disasters at the onset of the anthropocene. *Annu. Rev. Anthropol.* 46, 151–166. doi: 10.1146/annurev-anthro-102116-041635
- Bausch, T., Gartner, W. C., and Ortanderl, F. (2020). How to avoid a COVID-19 research paper tsunami? A tourism system approach. *J. Travel Res.* 60, 467–485. doi: 10.1177/0047287520972805
- Bhaskara, G. I., and Filimonau, V. (2021). The COVID-19 pandemic and organisational learning for disaster planning and management: a perspective of tourism businesses from a destination prone to consecutive disasters. *J. Hosp. Tour. Manag.* 46, 364–375. doi: 10.1016/j.jhtm.2021.01.011
- Bires, Z., and Raj, S. (2020). Tourism as a pathway to livelihood diversification: evidence from biosphere reserves, Ethiopia. *Tour. Manag.* 81, 104159. doi: 10.1016/j.tourman.2020.104159
- Blake, A., and Sinclair, M. T. (2003). Tourism crisis management. *Ann. Tour. Res.* 30, 813–832.
- Boluk, K. A., Cavaliere, C. T., and Higgins-Desbiolles, F. (2019). A critical framework for interrogating the United Nations Sustainable Development Goals 2030 Agenda in tourism. *J. Sustain. Tour.* 27, 847–864. doi: 10.1080/09669582.2019.1619748
- Brewer, M. B. (2016). The social self: on being the same and different at the same time. *Pers. Soc. Psychol. Bull.* 17, 475–482.
- Brodbeck, K.-H. (2019). *Die Illusion Der Identität Und Die Krise Der Wissenschaften: Working Paper Serie*. koblenz: Cusanus Hochschule.
- Buckley, R., and Westaway, D. (2020). Mental health rescue effects of women's outdoor tourism: a role in COVID-19 recovery. *Ann. Tour. Res.* 85:103041. doi: 10.1016/j.annals.2020.103041
- Canh, N. P., and Thanh, S. D. (2020). Domestic tourism spending and economic vulnerability. *Ann. Tour. Res.* 85:103063.
- Carpenter, C. J. (2010). A meta-analysis of the effectiveness of health belief model variables in predicting behavior. *Health Commun.* 25, 661–669.
- Cartier, E. A., and Taylor, L. L. (2020). Living in a wildfire: the relationship between crisis management and community resilience in a tourism-based destination. *Tour. Manag. Perspect.* 34:100635. doi: 10.1016/j.tmp.2020.10.0635
- Castonguay, J., Filer, C. R., and Pitts, M. J. (2016). Seeking help for depression: applying the health belief model to illness narratives. *South. Commun. J.* 81, 289–303. doi: 10.1080/1041794x.2016.1165729
- Colombo, M. G., Piva, E., Quas, A., and Rossi-Lamastra, C. (2016). How high-tech entrepreneurial ventures cope with the global crisis: changes in product innovation and internationalization strategies. *Ind. Innov.* 23, 647–671.
- Constantiou, I. D., and Kallinikos, J. (2015). New games, new rules: big data and the changing context of strategy. *J. Inf. Technol.* 30, 44–57. doi: 10.1057/jit.2014.17
- Crespí-Cladera, R., Martín-Oliver, A., and Pascual-Fuster, B. (2021). Financial distress in the hospitality industry during the Covid-19 disaster. *Tour. Manag.* 85:104301. doi: 10.1016/j.tourman.2021.104301
- Cró, S., and Martins, A. M. (2017). Structural breaks in international tourism demand: are they caused by crises or disasters? *Tour. Manag.* 63, 3–9. doi: 10.1016/j.tourman.2017.05.009
- Cuomo, M. T., Tortora, D., Foroudi, P., Giordano, A., Festa, G., and Metallo, G. (2021). Digital transformation and tourist experience co-design: big social data for planning cultural tourism. *Technol. Forecast. Soc. Change* 162:120345. doi: 10.1016/j.techfore.2020.120345
- D'Amico, F., Peyrin-Biroulet, L., and Danese, S. (2020). Inflammatory bowel diseases and COVID-19: the invisible enemy. *Gastroenterology* 158, 2302–2304. doi: 10.1053/j.gastro.2020.04.032
- Daye, M., Charman, K., Wang, Y., and Suzhikova, B. (2019). Exploring local stakeholders' views on the prospects of China's Belt & Road Initiative on tourism development in Kazakhstan. *Curr. Issues Tour.* 23, 1948–1962. doi: 10.1080/13683500.2019.1700941
- de Calheiros Velozo, J., and Stauder, J. E. A. (2018). Exploring social media use as a composite construct to understand its relation to mental health: a pilot study on adolescents. *Child. Youth Serv. Rev.* 91, 398–402. doi: 10.1016/j.childyouth.2018.06.039
- Deffenbacher, J. L. (1977). Relationship of worry and emotionality to performance on the miller analogies test. *J. Educ. Psychol.* 69, 191–195.
- Duarte Alonso, A., Kok, S. K., Bressan, A., O'Shea, M., Sakellarios, N., Koresis, A., et al. (2020). COVID-19, aftermath, impacts, and hospitality firms: an international perspective. *Int. J. Hosp. Manag.* 91:102654. doi: 10.1016/j.ijhm.2020.102654
- Easterling, D. S. (2004). The residents' perspective in tourism research. *J. Travel Tour. Mark.* 17, 45–62. doi: 10.1300/J073v17n04_05
- Eitzinger, C., and Wiedemann, P. (2007). Risk perceptions in the alpine tourist destination Tyrol—An exploratory analysis of residents' views. *Tour. Manag.* 28, 911–916.
- Fang, J., Wang, X., Wen, Z., and Zhou, J. (2020). Fear of missing out and problematic social media use as mediators between emotional support from social media and phubbing behavior. *Addict. Behav.* 107:106430. doi: 10.1016/j.addbeh.2020.106430
- Farzanegan, M. R., Gholipour, H. F., Feizi, M., Nunkoo, R., and Andargoli, A. E. (2020). International tourism and outbreak of coronavirus (COVID-19): a cross-country analysis. *J. Travel Res.* 60, 687–692. doi: 10.1177/0047287520931593
- Fattahi, E., Solhi, M., Abbas, J., Kasmaei, P., Rastaghi, S., Pouresmaeil, M., et al. (2020). Prioritization of needs among students of University of Medical Sciences: a needs assessment. *J. Educ. Health Promot.* 9:57. doi: 10.4103/0445-7706.281641
- Firouraghi, N., Bagheri, N., Kiani, F., Goshayeshi, L., Ghayour-Mobarhan, M., Kimiafar, K., et al. (2020). A spatial database of colorectal cancer patients and potential nutritional risk factors in an urban area in the Middle East. *BMC Res. Notes* 13:466. doi: 10.1186/s13104-020-05310-z
- Frode, M., Kenneth, M., and Maria, H. (2017). The effects of coach-athlete working alliance on affect, worry and performance satisfaction among junior elite athletes. *IJASS (Int. J. Appl. Sports Sci.)* 29, 180–194. doi: 10.24985/ijass.2017.29.2.180
- Fu, Q., and Abbas, J. (2021). Reset the industry redux through corporate social responsibility: the COVID-19 tourism impact on hospitality firms through business model innovation. *Front. Psychol.* 12:709678. doi: 10.3389/fpsyg.2021.709678
- García-Villaverde, P. M., Ruiz-Ortega, M. J., Hurtado-Palomino, A., De La Gala-Velásquez, B., and Zirena-Bejarano, P. P. (2021). Social capital and innovativeness in firms in cultural tourism destinations: divergent contingent factors. *J. Destination Mark. Manag.* 19:100529. doi: 10.1016/j.jdmm.2020.100529
- Gautret, P., Botelho-Nevers, E., Brouqui, P., and Parola, P. (2012). The spread of vaccine-preventable diseases by international travellers: a public-health concern. *Clin. Microbiol. Infect.* 18, 77–84. doi: 10.1111/j.1469-0691.2012.03940.x
- Ge, T., Abbas, J., Abbas, A., Ullah, R., Sadiq, I., and Zhang, R. (2022). Women's entrepreneurial contribution to family income: innovative technologies promote females' entrepreneurship amid COVID-19 crisis. *Front. Psychol.* 12:828040. doi: 10.3389/fpsyg.2022.828040
- Gever, V. C., Talabi, F. O., Adelabu, O., Sanusi, B. O., and Talabi, J. M. (2021). Modeling predictors of COVID-19 health behaviour adoption, sustenance and discontinuation among social media users in Nigeria. *Telematics Inform.* 60:101584. doi: 10.1016/j.tele.2021.101584
- Gössling, S., Scott, D., and Hall, C. M. (2020). Pandemics, tourism and global change: a rapid assessment of COVID-19. *J. Sustain. Tour.* 29, 1–20. doi: 10.1080/09669582.2020.1758708
- Gössling, S., Scott, D., Hall, C. M., Ceron, J.-P., and Dubois, G. (2012). Consumer behaviour and demand response of tourists to climate change. *Ann. Tour. Res.* 39, 36–58. doi: 10.1016/j.annals.2011.11.002
- Halder, S., and Sarda, R. (2021). Promoting intangible cultural heritage (ICH) tourism: strategy for socioeconomic development of snake charmers (India) through geoeducation, geotourism and geoconservation. *Int. J. Geohierit. Parks* 9, 212–232. doi: 10.1016/j.ijgeop.2021.02.008
- Hall, C. M., Prayag, G., and Amore, A. (2018). *Tourism And Resilience: Individual, Organisational And Destination Perspectives*. Bristol: Channel View Publications.
- Hall, C. M., Scott, D., and Gössling, S. (2020). Pandemics, transformations and tourism: be careful what you wish for. *Tour. Geogr.* 22, 577–598. doi: 10.1080/14616688.2020.1759131

- Hao, F., Xiao, Q., and Chon, K. (2020). COVID-19 and China's hotel industry: impacts, a disaster management framework, and post-pandemic agenda. *Int. J. Hosp. Manag.* 90:102636. doi: 10.1016/j.ijhm.2020.102636
- Higgins-Desbiolles, F. (2020). Socialising tourism for social and ecological justice after COVID-19. *Tour. Geogr.* 22, 610–623.
- Hilsenrath, J. (2020). Global viral outbreaks like coronavirus, once rare, will become more common. *Wall Street J.*
- Hosseini, N., Fakhar, F., Kiani, B., and Eslami, S. (2019). Enhancing the security of patients' portals and websites by detecting malicious web crawlers using machine learning techniques. *Int. J. Med. Inform.* 132, 103976. doi: 10.1016/j.ijmedinf.2019.103976
- Im, J., Kim, J., and Choeh, J. Y. (2021). COVID-19, social distancing, and risk-averse actions of hospitality and tourism consumers: a case of South Korea. *J. Destination Mark. Manag.* 20:100566.
- Ioannides, D., and Gyimóthy, S. (2020). The COVID-19 crisis as an opportunity for escaping the unsustainable global tourism path. *Tour. Geogr.* 22, 624–632.
- Jimenez, T., Restar, A., Helm, P. J., Cross, R. I., Barath, D., and Arndt, J. (2020). Fatalism in the context of COVID-19: Perceiving coronavirus as a death sentence predicts reluctance to perform recommended preventive behaviors. *SSM Popul. Health* 11:100615. doi: 10.1016/j.ssmph.2020.100615
- Jones, C. J., Smith, H., and Llewellyn, C. (2014). Evaluating the effectiveness of health belief model interventions in improving adherence: a systematic review. *Health Psychol. Rev.* 8, 253–269.
- Joo, D., Xu, W., Lee, J., Lee, C.-K., and Woosnam, K. M. (2021). Residents' perceived risk, emotional solidarity, and support for tourism amidst the COVID-19 pandemic. *J. Destination Mark. Manag.* 1:100553. doi: 10.1016/j.jdmm.2021.100553
- Jordan, E. J., Moran, C., and Godwyll, J. M. (2021). Does tourism really cause stress? A natural experiment utilizing ArcGIS Survey123. *Curr. Issues Tour.* 24, 1–15. doi: 10.1080/13683500.2019.1702001
- Jucan, C. N., and Jucan, M. S. (2013). Travel and tourism as a driver of economic recovery. *Proc. Econ. Finance* 6, 81–88. doi: 10.1016/s2212-5671(13)00117-2
- Kallbekken, S., and Sælen, H. (2021). Public support for air travel restrictions to address COVID-19 or climate change. *Transp. Res. Part D* 93, 102767.
- Kalantry, S., and Tarafder, A. (2021). Death by paperwork: determination of citizenship and detention of alleged foreigners in Assam. *SSRN Electronic J.* 1–41. doi: 10.2139/ssrn.3873978
- Karl, M., Muskat, B., and Ritchie, B. W. (2020). Which travel risks are more salient for destination choice? An examination of the tourist's decision-making process. *J. Destination Mark. Manag.* 18:100487.
- Kaushal, V., and Srivastava, S. (2021). Hospitality and tourism industry amid COVID-19 pandemic: perspectives on challenges and learnings from India. *Int. J. Hosp. Manag.* 92:102707. doi: 10.1016/j.ijhm.2020.102707
- Khazaie, H., Lebni, J. Y., Abbas, J., Mahaki, B., Chaboksavar, F., Kianipour, N., et al. (2021). Internet addiction status and related factors among medical students: a cross-sectional study in Western Iran. *Int. Q. Community Health Educ.* 272684X211025438. doi: 10.1177/0272684X211025438
- Kreiner, N. C., and Ram, Y. (2020). National tourism strategies during the Covid-19 pandemic. *Ann. Tour. Res.* 992:103076. doi: 10.1016/j.annals.2020.103076
- Kuo, H.-I., Chen, C.-C., Tseng, W.-C., Ju, L.-F., and Huang, B.-W. (2008). Assessing impacts of SARS and Avian Flu on international tourism demand to Asia. *Tour. Manag.* 29, 917–928. doi: 10.1016/j.tourman.2007.10.006
- Lange, K. W. (2021). Coronavirus disease 2019 (COVID-19) and global mental health. *Glob. Health J.* 5, 31–36. doi: 10.1016/j.glohj.2021.02.004
- Le, D., and Phi, G. (2021). Strategic responses of the hotel sector to COVID-19: toward a refined pandemic crisis management framework. *Int. J. Hosp. Manag.* 94:102808. doi: 10.1016/j.ijhm.2020.102808
- Lebni, J. Y., Toghroli, R., Abbas, J., Nejhaddadgar, N., Salahshoor, M. R., Mansourian, M., et al. (2020). A study of internet addiction and its effects on mental health: a study based on Iranian University Students. *J. Educ. Health Promot.* 9:205. doi: 10.4103/jehp.jehp_148_20
- Lee, C.-C., and Chen, M.-P. (2021). Ecological footprint, tourism development, and country risk: international evidence. *J. Cleaner Prod.* 279:123671. doi: 10.1016/j.jclepro.2020.123671
- Lei, K., Wen, C., and Wang, X. (2021). Research on the coordinated development of tourism economy based on embedded dynamic data. *Microprocess. Microsyst.* 82:103933. doi: 10.1016/j.micpro.2021.103933
- Lepp, A., and Gibson, H. (2003). Tourist roles, perceived risk and international tourism. *Ann. Tour. Res.* 30, 606–624. doi: 10.1016/s0160-7383(03)00024-0
- Li, Y., Wang, X., Lin, X., and Hajli, M. (2018). Seeking and sharing health information on social media: a net valence model and cross-cultural comparison. *Technol. Forecast. Soc. Change* 126, 28–40. doi: 10.1016/j.techfore.2016.07.021
- Lin, X., and Kishore, R. (2021). Social media-enabled healthcare: a conceptual model of social media affordances, online social support, and health behaviors and outcomes. *Technol. Forecast. Soc. Change* 166:120574. doi: 10.1016/j.techfore.2021.120574
- Lindberg, K., and Johnson, R. L. (1997). The economic values of tourism's social impacts. *Ann. Tour. Res.* 24, 90–116. doi: 10.1016/s0160-7383(96)00033-3
- Liu, Q., Qu, X., Wang, D., Abbas, J., and Mubeen, R. (2021). Product market competition and firm performance: business survival through innovation and entrepreneurial orientation amid COVID-19 financial crisis. *Front. Psychol.* 12:790923. doi: 10.3389/fpsyg.2021.790923
- Local Burden of Disease HIVC (2021). Mapping subnational HIV mortality in six Latin American countries with incomplete vital registration systems. *BMC Med.* 19:4. doi: 10.1186/s12916-020-01876-4
- Lukashina, N. S., Amirkhanov, M. M., Anisimov, V. I., and Trunev, A. (1996). Tourism and environmental degradation in sochi, Russia. *Ann. Tour. Res.* 23, 654–665. doi: 10.1016/0160-7383(95)00086-0
- Ma, D., Hu, J., and Yao, F. (2021). Big data empowering low-carbon smart tourism study on low-carbon tourism O2O supply chain considering consumer behaviors and corporate altruistic preferences. *Comput. Ind. Eng.* 153:107061. doi: 10.1016/j.cie.2020.107061
- Ma, X., de Jong, M., Sun, B., and Bao, X. (2020). Nouveauté or cliché? Assessment on island ecological vulnerability to tourism: application to zhoushan, China. *Ecol. Indic.* 113:106247. doi: 10.1371/journal.pone.0190309
- MacIntyre, C. R. (2020). Global spread of COVID-19 and pandemic potential. *Glob. Biosecur.* 1, 1–3. doi: 10.31646/gbio.55
- Mafini, C., and Poee David, R. I. (2013). The relationship between employee satisfaction and organisational performance : evidence from a South African government department : original research. *SA J. Ind. Psychol.* 39, 1–9.
- Mamirkulova, G., Mi, J., Abbas, J., Mahmood, S., Mubeen, R., and Ziapour, A. (2020). New Silk Road infrastructure opportunities in developing tourism environment for residents better quality of life. *Glob. Ecol. Conserv.* 24:e01194. doi: 10.1016/j.gecco.2020.e01194
- Mamirkulova, G., Mi, J., and Abbas, J. (2022). Economic corridor and tourism sustainability amid unpredictable COVID-19 challenges: assessing community well-being in the World Heritage Sites. *Front. Psychol.* 12:797568. doi: 10.3389/fpsyg.2022.797568
- Maqsood, A., Abbas, J., Rehman, G., and Mubeen, R. (2021). The paradigm shift for educational system continuance in the advent of COVID-19 pandemic: Mental health challenges and reflections. *Curr. Res. Behav. Sci.* 2:100011. doi: 10.1016/j.crbeha.2020.100011
- McCabe, S., and Qiao, G. (2020). A review of research into social tourism: launching the annals of tourism research curated collection on social tourism. *Ann. Tour. Res.* 85:103103. doi: 10.1016/j.annals.2021.103313
- McKenna, K. Y. A., and Bargh, J. A. (1998). Coming out in the age of the Internet: identity “demarginalization” through virtual group participation. *J. Pers. Soc. Psychol.* 75, 681–694. doi: 10.1037/0022-3514.75.3.681
- McKercher, B., and Chon, K. (2004). The over-reaction to sars and the collapse of asian tourism. *Ann. Tour. Res.* 31, 716–719. doi: 10.1016/j.annals.2003.11.002
- Miech, J. A., Herckes, P., and Fraser, M. P. (2021). Effect of COVID-19 travel restrictions on phoenix air quality after accounting for boundary layer variations. *Atmos. Environ.* 10:100105. doi: 10.1016/j.aea.2021.100105
- Mubeen, R., Han, D., Abbas, J., Alvarez-Otero, S., and Sial, M. S. (2021a). The relationship between CEO duality and business firms' performance: the moderating role of firm size and corporate social responsibility. *Front. Psychol.* 12:669715. doi: 10.3389/fpsyg.2021.669715
- Mubeen, R., Han, D., Abbas, J., and Raza, S. (2021b). Examining the relationship between product market competition and Chinese firms performance: the mediating impact of capital structure and moderating influence of firm size. *Front. Psychol.* 12:709678. doi: 10.3389/fpsyg.2021.709678
- Narayanamurthy, G., and Tortorella, G. (2021). Impact of COVID-19 outbreak on employee performance – moderating role of industry 4.0 base technologies. *Int. J. Prod. Econ.* 234:108075. doi: 10.1016/j.ijpe.2021.108075

- Naslund, J. A., Aschbrenner, K. A., Marsch, L. A., and Bartels, S. J. (2016). The future of mental health care: peer-to-peer support and social media. *Epidemiol. Psychiatr. Sci.* 25, 113–122. doi: 10.1017/s2045796015001067
- NeJhaddadgar, N., Ziapour, A., Zakkipour, G., Abbas, J., Abolfathi, M., and Shabani, M. (2020). Effectiveness of telephone-based screening and triage during COVID-19 outbreak in the promoted primary healthcare system: a case study in Ardabil province, Iran. *Z. Gesundh. Wiss* 29, 1–6. doi: 10.1007/s10389-020-01407-8
- Neuburger, L., and Egger, R. (2020). Travel risk perception and travel behaviour during the COVID-19 pandemic 2020: a case study of the DACH region. *Curr. Issues Tour.* 24, 1003–1016. doi: 10.1080/13683500.2020.1803807
- Novelli, M., Gussing Burgess, L., Jones, A., and Ritchie, B. W. (2018). 'No Ebola still doomed' – the ebola-induced tourism crisis. *Ann. Tour. Res.* 70, 76–87. doi: 10.1016/j.annals.2018.03.006
- Nowlin, C. (2017). Understanding and undermining the growth paradigm. *Dialogue* 56, 559–593. doi: 10.1017/s0012217317000555
- Oum, T. H., and Wang, K. (2020). Socially optimal lockdown and travel restrictions for fighting communicable virus including COVID-19. *Transp. Policy (Oxf)*, 96, 94–100. doi: 10.1016/j.tranpol.2020.07.003
- Page, S., Song, H., and Wu, D. C. (2011). Assessing the Impacts of the global economic crisis and swine flu on inbound tourism demand in the United Kingdom. *J. Travel Res.* 51, 142–153. doi: 10.1177/0047287511400754
- Park, E., Kim, W.-H., and 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 Tour.* 1–5. doi: 10.1080/13683500.2020.1823336
- Park, J.-Y., Hight, S. K., Bufquin, D., de Souza Meira, J. V., and Back, R. M. (2021). An examination of restaurant employees' work-life outlook: the influence of support systems during COVID-19. *Int. J. Hosp. Manag.* 97:102992. doi: 10.1016/j.ijhm.2021.102992
- Paulson, K. R., Kamath, A. M., Alam, T., Bienhoff, K., Abady, G. G., Abbas, J., et al. (2021). Global, regional, and national progress towards sustainable development goal 3.2 for neonatal and child health: all-cause and cause-specific mortality findings from the Global Burden of Disease Study 2019. *Lancet* 398, 870–905. doi: 10.1016/S0140-6736(21)01207-1
- Pereira, V., Temouri, Y., Patnaik, S., and Mellahi, K. (2020). Managing and preparing for emerging infectious diseases: avoiding a catastrophe. *Acad. Manag. Perspect.* 34, 480–492. doi: 10.15585/mmwr.mm6936a1
- Pham, T. T. T. (2020). Tourism in marine protected areas: can it be considered as an alternative livelihood for local communities? *Mar. Policy* 115:103891. doi: 10.1016/j.marpol.2020.103891
- Piccinelli, S., Moro, S., and Rita, P. (2021). Air-travelers' concerns emerging from online comments during the COVID-19 outbreak. *Tour. Manag.* 85:104313. doi: 10.1016/j.tourman.2021.104313
- Pouresmael, M., Abbas, J., Solhi, M., Ziapour, A., and Fattahi, E. (2019). Prioritizing health promotion lifestyle domains in students of Qazvin University of Medical Sciences from the students and professors' perspective. *J. Educ. Health Promot.* 8:228. doi: 10.4103/jehp.jehp_250_19
- Rahmat, T. E., Raza, S., Zahid, H., Abbas, J., Mohd Sobri, F., and Sidiki, S. (2022). Nexus between integrating technology readiness 2.0 index and students' e-library services adoption amid the COVID-19 challenges: implications based on the theory of planned behavior. *J. Educ. Health Promot.* 11:50. doi: 10.4103/jehp.jehp_508_21
- Reisinger, Y., and Mavondo, F. (2006). Cultural differences in travel risk perception. *J. Travel Tour. Mark.* 20, 13–31. doi: 10.1300/j073v20n01_02
- Richter, L. K. (2016). International tourism and its global public health consequences. *J. Travel Res.* 41, 340–347. doi: 10.1177/0047287503041004002
- Ritchie, B. (2008). Tourism disaster planning and management: from response and recovery to reduction and readiness. *Curr. Issues Tour.* 11, 315–348. doi: 10.1080/13683500802140372
- Ritchie, B. W., and Jiang, Y. (2019). A review of research on tourism risk, crisis and disaster management: launching the annals of tourism research curated collection on tourism risk, crisis and disaster management. *Ann. Tour. Res.* 79:102812. doi: 10.1016/j.annals.2019.102812
- Rosenstock, I. M. (2005). Why people use health services. *Milbank Q.* 83, 1–32. doi: 10.1111/j.1468-0009.2005.00425.x
- Rothan, H. A., and Byrareddy, S. N. (2020). The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. *J. Autoimmun.* 109:102433. doi: 10.1016/j.jaut.2020.102433
- Sah, R., Sigdel, S., Ozaki, A., Kotera, Y., Bhandari, D., Regmi, P., et al. (2020). Impact of COVID-19 on tourism in Nepal. *J. Travel Med.* 27:taaa105.
- Sands, P. (2019). *Outbreak Readiness and Business Impact: Protecting Lives and Livelihoods across the Global Economy*. Boston, MA: Harvard Global Health Institute & World Economic Forum.
- Sarfraz, R., Aqeel, M., Lactao, J., Khan, S., and Abbas, J. (2021). Coping strategies, pain severity, pain anxiety, depression, positive and negative affect in osteoarthritis patients; a mediating and moderating model. *Nat. Nurt. J. Psychol.* 1, 18–28.
- Saqib, Z. A., Dai, J., Menhas, R., Mahmood, S., Karim, M., Sang, X., et al. (2020). Physical activity is a medicine for non-communicable diseases: a survey study regarding the perception of physical activity impact on health wellbeing. *Risk Manag. Healthc. Policy.* 13, 2949–2962. doi: 10.2147/rmh.p.s280339
- Sarkar, P., Debnath, N., and Reang, D. (2021). Coupled human-environment system amid COVID-19 crisis: a conceptual model to understand the nexus. *Sci. Total Environ.* 753:141757. doi: 10.1016/j.scitotenv.2020.141757
- Sathish, R., Manikandan, R., Priscila, S. S., Sara, B. V., and Mahaveerakannan, R. (2020). "A Report on the impact of information technology and social media on Covid19." *Proceeding of the 2020 3rd International Conference on Intelligent Sustainable Systems (ICISS)*.
- Schmidt, L., Gomes, C., Guerreiro, S., and O'Riordan, T. (2014). Are we all on the same boat? The challenge of adaptation facing Portuguese coastal communities: risk perception, trust-building and genuine participation. *Land Use Policy* 38, 355–365. doi: 10.1016/j.landusepol.2013.11.008
- Scott, N., and Laws, E. (2006). Tourism crises and disasters: enhancing understanding of system effects. *J. Travel Tour. Mark.* 19, 149–158. doi: 10.1300/J073v19n02_12
- Seabra, C., Reis, P., and Abrantes, J. L. (2020). The influence of terrorism in tourism arrivals: a longitudinal approach in a Mediterranean country. *Ann. Tour. Res.* 80:102811. doi: 10.1016/j.annals.2019.102811
- Sharifpour, M., Walters, G., and Ritchie, B. W. (2014). Risk perception, prior knowledge, and willingness to travel: investigating the Australian tourist market's risk perceptions towards the Middle East. *J. Vacat. Mark.* 20, 111–123. doi: 10.1177/1356766713502486
- Sheldon, K. M., and King, L. (2001). Why positive psychology is necessary. *Am. Psychol.* 56, 216–217. doi: 10.1037/0003-066x.56.3.216
- Shi, Y., Wang, J., Yang, Y., Wang, Z., Wang, G., Hashimoto, K., et al. (2020). Knowledge and attitudes of medical staff in Chinese psychiatric hospitals regarding COVID-19. *Brain Behav. Immun. Health* 4:100064. doi: 10.1016/j.bbih.2020.100064
- Shuja, K. H., Aqeel, M., Jaffar, A., and Ahmed, A. (2020). COVID-19 pandemic and impending global mental health implications. *Psychiatr. Danub.* 32, 32–35. doi: 10.24869/psyd.2020.32
- Shuja, K. H., Shahidullah, Aqeel, M., Khan, E. A., and Abbas, J. (2020). Letter to highlight the effects of isolation on elderly during COVID-19 outbreak. *Int. J. Geriatr. Psychiatry* 35, 1477–1478. doi: 10.1002/gps.5423
- SioChong, U., and YukChow, S. (2020). The impacts of financial and non-financial crises on tourism: evidence from Macao and Hong Kong. *Tour. Manag. Perspect.* 33:100628. doi: 10.1016/j.tmp.2019.100628
- Škare, M., Soriano, D. R., and Porada-Rochoń, M. (2021). Impact of COVID-19 on the travel and tourism industry. *Technol. Forecast. Soc. Change* 163:120469.
- Sklett, V. H., Lorås, H. W., and Sigmundsson, H. (2018). Self-Efficacy, flow, affect, worry and performance in elite world cup ski jumping. *Front. Psychol.* 9:1215. doi: 10.3389/fpsyg.2018.01215
- Song, H., Livat, F., and Ye, S. (2019). Effects of terrorist attacks on tourist flows to France: is wine tourism a substitute for urban tourism? *J. Destination Mark. Manag.* 14:100385. doi: 10.1016/j.jdmm.2019.100385
- Sorosh, A., Ziapour, A., Abbas, J., Jahanbin, I., Andayeshgar, B., Moradi, F., et al. (2021). Effects of group logotherapy training on self-esteem, communication skills, and impact of event scale-revised (IES-R) in older adults. *Ageing Int.* 46, 1–12. doi: 10.1007/s12126-021-09458-2
- Stefan, S., and David, D. (2013). The functions of worry and its relation to performance in controllable and uncontrollable situations. *Cogn. Emot.* 27, 521–529. doi: 10.1080/02699931.2012.722075

- Su, Z., McDonnell, D., Cheshmehzangi, A., Abbas, J., Li, X., and Cai, Y. (2021a). The promise and perils of Unit 731 data to advance COVID-19 research. *BMJ Glob. Health* 6:e004772. doi: 10.1136/bmjgh-2020-004772
- Su, Z., McDonnell, D., Li, X., Bennett, B., Segalo, S., Abbas, J., et al. (2021b). COVID-19 vaccine donations-vaccine empathy or vaccine diplomacy? A narrative literature review. *Vaccines (Basel)* 9:1024. doi: 10.3390/vaccines9091024
- Su, Z., McDonnell, D., Wen, J., Kozak, M., Abbas, J., Segalo, S., et al. (2021c). Mental health consequences of COVID-19 media coverage: the need for effective crisis communication practices. *Glob. Health* 17:4. doi: 10.1186/s12992-020-00654-4
- Su, Z., Wen, J., Abbas, J., McDonnell, D., Cheshmehzangi, A., Li, X., et al. (2020). A race for a better understanding of COVID-19 vaccine non-adopters. *Brain Behav. Immun. Health* 9:100159. doi: 10.1016/j.bbih.2020.100159
- Tambo, E., Djuikoue, I. C., Tazemda, G. K., Fotsing, M. F., and Zhou, X.-N. (2021). Early stage risk communication and community engagement (RCCE) strategies and measures against the coronavirus disease 2019 (COVID-19) pandemic crisis. *Glob. Health J.* 5, 44–50. doi: 10.1016/j.glohj.2021.02.009
- Tan, Y. T., Rehm, I. C., Stevenson, J. L., and De Foe, A. (2021). Social media peer support groups for obsessive-compulsive and related disorders: understanding the predictors of negative experiences. *J. Affect. Disord.* 281, 661–672. doi: 10.1016/j.jad.2020.11.094
- Tang, Z., Miller, A. S., Zhou, Z., and Warkentin, M. (2021). Does government social media promote users' information security behavior towards COVID-19 scams? Cultivation effects and protective motivations. *Gov. Inf. Q.* 38:101572. doi: 10.1016/j.giq.2021.101572
- Tengilimoglu, D., Zekioglu, A., Tosun, N., Isik, O., and Tengilimoglu, O. (2021). Impacts of COVID-19 pandemic period on depression, anxiety and stress levels of the healthcare employees in Turkey. *Leg. Med. (Tokyo)* 48:101811. doi: 10.1016/j.legalmed.2020.101811
- Toqeer, S., Aqeel, M., Shuja, K. H., Bibi, A., and Abbas, J. (2021). Attachment styles, facebook addiction, dissociation and alexithymia in university students; a mediational model. *Nat. Nurt. J. Psychol.* 1, 28–37.
- Tu, Y., Li, D., and Wang, H.-J. (2021). COVID-19-induced layoff, survivors' COVID-19-related stress and performance in hospitality industry: the moderating role of social support. *Int. J. Hosp. Manag.* 95:102912. doi: 10.1016/j.ijhm.2021.102912
- UNWTO (2019). *International Tourism Highlights*. Madrid: UNWTO.
- Verma, S., and Gustafsson, A. (2020). Investigating the emerging COVID-19 research trends in the field of business and management: a bibliometric analysis approach. *J. Bus. Res.* 118, 253–261. doi: 10.1016/j.jbusres.2020.06.057
- Vu, T.-V., Vo-Thanh, T., Phong Nguyen, N., Van Nguyen, D., and Chi, H. (2021). The COVID-19 pandemic: workplace safety management practices, job insecurity, and employees' organizational citizenship behavior. *Saf. Sci.* 145:105527. doi: 10.1016/j.ssci.2021.105527
- Wang, C., Wang, D., Abbas, J., Duan, K., and Mubeen, R. (2021). Global financial crisis, smart lockdown strategies, and the COVID-19 spillover impacts: a global perspective implications from Southeast Asia. *Front. Psychiatry* 12:643783. doi: 10.3389/fpsy.2021.643783
- Wang, G., Zhang, Y., Zhao, J., Zhang, J., and Jiang, F. (2020). Mitigate the effects of home confinement on children during the COVID-19 outbreak. *Lancet* 395, 945–947.
- Wang, J., Liu-Lastres, B., Ritchie, B. W., and Pan, D.-Z. (2019). Risk reduction and adventure tourism safety: an extension of the risk perception attitude framework (RPAF). *Tour. Manag.* 74, 247–257. doi: 10.1016/j.tourman.2019.03.012
- Wang, Y. S. (2009). The impact of crisis events and macroeconomic activity on Taiwan's international inbound tourism demand. *Tour. Manag.* 30, 75–82. doi: 10.1016/j.tourman.2008.04.010
- Wondirad, A., Kebete, Y., and Li, Y. (2021). Culinary tourism as a driver of regional economic development and socio-cultural revitalization: evidence from amhara national regional state, ethiopia. *J. Destination Mark. Manag.* 19:100482. doi: 10.1016/j.jdmm.2020.100482
- Wong, I. A., Ou, J., and Wilson, A. (2021). Evolution of hoteliers' organizational crisis communication in the time of mega disruption. *Tour. Manag.* 84:104257. doi: 10.1016/j.tourman.2020.104257
- Wong, J., Newton, J. D., and Newton, F. J. (2014). Effects of power and individual-level cultural orientation on preferences for volunteer tourism. *Tour. Manag.* 42, 132–140. doi: 10.1016/j.tourman.2013.11.004
- Wut, T. M., Xu, J., and Wong, S.-M. (2021). Crisis management research (1985–2020) in the hospitality and tourism industry: a review and research agenda. *Tour. Manag.* 85:104307.
- Yang, E., Kim, J., and Pennington-Gray, L. (2021). Social media information and peer-to-peer accommodation during an infectious disease outbreak. *J. Destination Mark. Manag.* 19:100538. doi: 10.1016/j.jdmm.2020.10.0538
- Yang, Y., Zhang, H., and Chen, X. (2020). Coronavirus pandemic and tourism: Dynamic stochastic general equilibrium modeling of infectious disease outbreak. *Ann. Tour. Res.* 83:102913. doi: 10.1016/j.annals.2020.10.2913
- Yao, J., Ziapour, A., Abbas, J., Toraji, R., and Nejhadadgar, N. (2022). Assessing puberty-related health needs among 10–15-year-old boys: a cross-sectional study approach. *Arch. Pédiatr.* 29. doi: 10.1016/j.arcped.2021.11.018
- Yin, J., and Ni, Y. (2021). COVID-19 event strength, psychological safety, and avoidance coping behaviors for employees in the tourism industry. *J. Hosp. Tour. Manag.* 47, 431–442.
- Yoosefi Lebni, J., Abbas, J., Khorami, F., Khosravi, B., Jalali, A., and Ziapour, A. (2020). Challenges facing women survivors of self-immolation in the Kurdish regions of Iran: a qualitative study. *Front. Psychiatry* 11:778. doi: 10.3389/fpsy.2020.00778
- Yoosefi Lebni, J., Abbas, J., Moradi, F., Salahshoor, M. R., Chaboksavar, F., Irandoost, S. F., et al. (2021). How the COVID-19 pandemic effected economic, social, political, and cultural factors: a lesson from Iran. *Int. J. Soc. Psychiatry* 67, 298–300. doi: 10.1177/0020764020939984
- Yu, Q., McManus, R., Yen, D. A., and Li, X. (2020). Tourism boycotts and animosity: a study of seven events. *Ann. Tour. Res.* 80:102792.
- Zenker, S., and Kock, F. (2020). The coronavirus pandemic – a critical discussion of a tourism research agenda. *Tour. Manag.* 81:104164. doi: 10.1016/j.tourman.2020.104164
- Zhang, J., Xie, C., and Morrison, A. M. (2021). The effect of corporate social responsibility on hotel employee safety behavior during COVID-19: the moderation of belief restoration and negative emotions. *J. Hosp. Tour. Manag.* 46, 233–243. doi: 10.1016/j.jhtm.2020.12.011
- Zhao, J., Han, H., Zhong, B., Xie, W., Chen, Y., and Zhi, M. (2021). Health information on social media helps mitigate Crohn's disease symptoms and improves patients' clinical course. *Comput. Hum. Behav.* 115:106588. doi: 10.1016/j.chb.2020.106588
- Zheng, D., Luo, Q., and Ritchie, B. W. (2021). Afraid to travel after COVID-19? Self-protection, coping and resilience against pandemic 'travel fear'. *Tour. Manag.* 83:104261. doi: 10.1016/j.tourman.2020.104261
- Zhong, B., Huang, Y., and Liu, Q. (2021). Mental health toll from the coronavirus: social media usage reveals Wuhan residents' depression and secondary trauma in the COVID-19 outbreak. *Comput. Hum. Behav.* 114:106524. doi: 10.1016/j.chb.2020.106524
- Zhou, Y., Draghici, A., Abbas, J., Mubeen, R., Boatca, M. E., and Salam, M. A. (2022). Social media efficacy in crisis management: effectiveness of non-pharmaceutical interventions to manage COVID-19 challenges. *Front. Psychiatry* 12:626134. doi: 10.3389/fpsy.2021.626134
- Zuboff, S. (2015). Big other: surveillance capitalism and the prospects of an information civilization. *J. Inf. Technol.* 30, 75–89. doi: 10.1057/jit.2015.5

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