TOURISM IN CRISIS: HOW COVID-19 SHAPED PERCEPTIONS OF TRAVEL RISK AND MANAGEMENT PRACTICES

Sunil MISHRA [1] , Bhuvanesh Kumar SHARMA [2*] , Ankita PATHAK [3] , Pooja JAIN [4] , Omvir SINGH [5]

[1] Sage University, Department of Management, Indore, Madhya Pradesh, India; drsunilrmishra@gmail.com (S.M.)
[2] Symbiosis Institute of Business Management, Pune, Symbiosis International (Deemed University), Pune, India; sharma.bhuvanesh86@gmail.com (B.S.)
[3] GLA University, Department of Management, Mathura, Uttar Pradesh, India; ankitapthk76@gmail.com (A.P.)
[4] Manipal University Jaipur, Department of Management-CDOE, India; pjain1203@gmail.com (P.J.)
[5] Vishwakarma University, Faculty of Commerce and Management, Pune, India; dromvirgautam1986@gmail.com (O.S.)

Abstract: Covid-19 posed numerous challenges to everyone, especially for travellers. Travellers were skeptical about travelling to places where they were not sure about hygiene and safety. These travellers were largely visiting places where they were confident that the administration take care of safety and security, also provide all the support required during and after covid 19. However, previous literature limits in understanding travellers' perceptions towards management of risk, which was one of the prevalent concerns to travellers. Therefore, this study explores how Covid-19 has reshaped tourists' risk perceptions and the tourism industry's management responses. We employed multiple cross-sectional survey to collect responses from 508 travellers who was recently travelled to the various places. The items of the questionnaire were adopted from previous studies to endure reliability and validity of the instrument. These responses were analysed using Covariance based structural equation modelling (CB-SEM), including measurement and structural model. The findings of the study underscore that post covid travellers' perception towards risk and management perception significantly changed. Travellers' positive perceptions about the destination management significantly influence the risk management, service delivery, transportation pattern, distribution channel, avoidance to the crowded places and health & hygiene. This study contributes to the academic literature by empirically linking pandemic-induced risk perceptions with travel behavior, offering a multi-dimensional framework for analysing tourist decision-making in crises. It enriches theory by integrating risk, service, and behavioral constructs in a post-crisis context. Additionally, tourism and hospitality sectors can use these insights to redesign their strategies by prioritizing health safety, flexible transportation, and de-crowding measures to align with evolved traveller expectations and build long-term trust. The study remains highly relevant as health scares, geopolitical tensions, and environmental crises continue to influence global travel. Its risk-response framework is adaptable for future disruptions, making it a valuable guide for resilient tourism planning and crisis preparedness.

Keywords: COVID-19, Pandemic, Traveller, Tourist, Tourism, Travel Risk, Tourist Travel, Management Perception

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INTRODUCTION

The COVID-19 pandemic has exerted a profound and enduring impact on global economies, with the tourism industry emerging as one of the most severely disrupted sectors (Carballo et al., 2024). In response to the crisis, governments worldwide enforced lockdowns and strict travel restrictions to curb viral transmission, leading to an unprecedented cessation of international and domestic travel (Carballo et al., 2024). This abrupt halt in mobility not only disrupted tourist flows but also compelled tourism stakeholders to rapidly adapt to evolving health, safety, and service expectations (Seyfi et al., 2023). The crisis triggered massive job losses and hindered economic development in regions heavily dependent on tourism, especially in emerging economies such as India, where healthcare access, testing infrastructure, and vaccination coverage were limited (Kaushal & Srivastava, 2021; Teng et al., 2023).

While a substantial body of literature has explored the relationship between pandemics and tourism disruptions, several limitations persist. Studies such as Wen et al. (2021) have examined tourists perceived risk in the context of global health crises, and Chinazzi et al. (2020) emphasized the effectiveness of international travel restrictions in mitigating virus transmission. Additionally, Golets et al. (2023) have documented changes in tourist behavior, particularly in relation to hygiene and destination trustworthiness, while Neuburger & Egger (2021) highlighted the emerging importance of risk management strategies in destination choice. Moreover, psychological, and mental health consequences of isolation, as noted by El-Zoghby et al. (2020), have further influenced tourist decision-making processes. Pathogen Stress Theory has been instrumental in explaining how infection-related risks affect social behavior and travel intentions (Bae & Chang,

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* Corresponding author

2021; Fincher & Thornhill, 2012). Despite these contributions, critical research gaps remain. Existing studies often isolate either traveller perceptions or public health dimensions without integrating the managerial and behavioral aspects of tourism risk. Specifically, limited research has investigated how tourists' perceptions of travel risk interact with their perceptions of risk management strategies at destinations. Empirical applications of psychological theories such as the Pathogen Stress Theory in explaining destination selection remain underdeveloped, particularly in post-pandemic contexts. Furthermore, few studies have examined the long-term adaptive responses of service providers to shifting traveller expectations, especially in developing countries (Rather, 2021). Recent scholarly discourse also calls for more localized and context-sensitive analyses that account for regional variations in healthcare infrastructure, vaccine availability, and government responsiveness (Abbas et al., 2021).

This study seeks to address these identified gaps by developing an integrative framework that examines the dual influence of perceived travel risk and risk management strategies on tourist behavior in the post-COVID-19 era. Grounded in the Pathogen Stress Theory, the study investigates how psychological and managerial perceptions collectively shape tourists' destination choices. By incorporating both travellers and managerial perspectives, this research offers a more holistic understanding of tourism recovery mechanisms. The findings aim to inform not only academic theory development but also practical policy and managerial strategies, thereby contributing to the literature on crisis and risk management in tourism. Ultimately, the study provides actionable insights for policymakers, tourism authorities, and hospitality businesses striving to build resilient and health-conscious travel ecosystems in a post-pandemic world.

MATERIAL

Travel risk and perception management are evaluated through pathogen stress theory. The theory determines the behaviour in societal issues. Meleady et al. (2021) explored the influence of pathogen threat concerning Covid-19. The Human sociality of Parasite stress theory highlights personality traits. The traits of getting the infection by interaction were human-to-human transmission infection, risk of spreading increases by having open human contact. As per the theory of Pathogen stress, people become less receptive to visitors, less curious, and less expletory as they exist in parasite-infested environments where people want to save themselves from getting infected. The theory has considered the cultural difference and the difference in population.

1. Effect of Covid-19 Pandemic

The pandemic situation of Covid-19 erupted in December 2019 in Wuhan, China, and rapidly escalated into a global health emergency due to human-to-human transmission. To contain the spread of the virus, almost all nations imposed stringent lockdowns and travel bans, resulting in a substantial decline in global mobility and a profound disruption in the tourism industry (Wen et al., 2021). Drawing parallels from previous crises like the 2003 SARS outbreak and the 2004 Indian Ocean Tsunami, which temporarily crippled Sri Lanka's tourism sector, it is evident that global tourism is highly susceptible to external shocks (Chinazzi et al., 2020; Gössling et al., 2020). The COVID-19 pandemic significantly reshaped travel behavior, with perceived risk emerging as a key factor influencing individuals' travel decisions. Studies have shown that risk perception affected not only the choice of travel mode (Wang et al., 2024a) but also overall travel intentions before and during the pandemic (Seyfi et al., 2024). Travelers were found to cluster into distinct groups based on their risk perceptions and behavioral responses (Brida et al., 2022), while social media and community engagement played crucial roles in shaping tourist behavior in rural destinations (Hussain et al., 2024a). These insights highlight the complex interplay between psychological, social, and contextual factors in travel decision-making during health crises.

Amid such crises, travellers tend to modify their preferences, opting for destinations that offer comprehensive safety protocols, hygiene assurance, and manageable crowd levels (Golets et al., 2023). As a result of that travellers may likely to postpone or cancel travel plans rather than exposing themselves to the risk of infection in overcrowded or poorly managed environments (Neuburger & Egger, 2021). Consequently, tourist footfall diminishes, leading to economic losses for both small and medium businesses in tourism. According to the United Nations World Tourism Organization (Grandcourt, 2020), the tourism industry was among the hardest hit sectors globally, with a loss exceeding US$300 billion due to the various travel restrictions posed amid Covid-19. Recent studies have reinforced the notion that perceived health risk and lack of confidence in destination management play a central role in shaping tourist decisions (Rather, 2021).

Therefore, it is crucial to understand how the pandemic induced fear and anxiety influence not only travel intentions but also the perception of tourism management. Thus, we proposed following hypothesis:

H$_1$: The fear of the Covid-19 pandemic significantly affects tourists' perception of travel risk and their perception of the destination management's ability to ensure safety and service quality.

2. Tourists' Travel Risk & Management Perception and Risk Management

In the wake of the COVID-19 pandemic, how tourists perceive travel risks and the way destinations manage those risks has become central to travel decisions. Health and safety are now at the forefront of travellers' minds, and people are paying close attention to the measures taken by governments, tourism boards, and service providers to protect them. Destinations that demonstrate strong, transparent, and proactive management of pandemic-related challenges are more likely to regain traveller trust and see a quicker recovery. Resilience, efficacy beliefs, and perceived risk have been found to significantly influence protective behaviors and travel intentions (Truong et al., 2025). Safety concerns, particularly among European tourists, also play a vital role in travel decisions. In destination choice, factors such as risk perception act as key moderators, especially in regions like Vietnam's Mekong Delta (Loi et al., 2024). Additionally, tourist ethnocentrism combined with perceived risk impacts consumer behavior within the hospitality and tourism

sectors (Bremser & Abraham, 2024), underscoring the multifaceted nature of travel decision-making in uncertain times. To rebuild momentum, many governments have taken steps like reopening borders, simplifying visa processes, and restoring international flights (Abbas et al., 2021). Meanwhile, tourism businesses have responded by stepping up hygiene standards, introducing contactless services, and improving health-related infrastructure all to provide reassurance and reduce travellers' fears ((Neuburger & Egger, 2021). Travellers are also taking matters into their own hands, increasingly relying on risk-mitigating options such as travel insurance, refundable bookings, and real-time alerts (Rather, 2021).

These choices show a clear link between how safe tourists feel and how prepared they perceive the destination to be. As Bassil et al. (2019) point out, tourism is particularly susceptible to crises, making effective risk management not just a best practice but a necessity. Recent research underscores that travellers are now more selective, often avoiding places that appear unprepared or communicate poorly about safety (Abdou et al., 2023; Kaushal & Srivastava, 2021).

Clear communication and visible safety efforts can ease anxiety and boost confidence in travel plans (Gössling et al., 2020). Based on this understanding, we propose the following hypothesis:

H$_2$: Travellers' perception of travel risk and destination management significantly influence the perceived effectiveness of risk management in the tourism industry.

3. Tourists' Travel Risk and Service Delivery

The restriction on the movement of citizens and perceived travel risks during the Covid-19 pandemic led to widespread flight cancellations, causing significant disruption to global tourism. These cancellations not only halted tourism flows but also triggered emotional distress, anxiety, and disappointment among travellers. The inability of service providers such as airlines, hotels, and tour operators to deliver promised services further eroded tourists' confidence in travel destinations. Efficient service delivery became a critical factor in maintaining the tourism sector's resilience during the crisis (Kaushal & Srivastava, 2021). Several studies noted that increased travel risk and negative perceptions of management significantly discouraged travel decisions (Neuburger & Egger, 2021).

Emerging technologies and service quality are becoming central to shaping tourist experiences and satisfaction in the post-pandemic era. Studies have emphasized the importance of perceived service quality in tourist transportation, particularly in destinations like Baños de Agua Santa, Ecuador (Velastegui-Hernández et al., 2024). At the same time, health and safety concerns significantly affect satisfaction and loyalty in contexts where tourism services are delivered by robots (Soliman et al., 2024). The integration of artificial intelligence in tourism businesses is also found to influence tourists' satisfaction and their intention to continue using such services (Ku & Chen, 2024), with perceived enjoyment playing a critical role in shaping future use intentions (Huang et al., 2024). Together, these findings highlight the growing relevance of technology and service quality in enhancing the tourism experience.

Racial discrimination further intensified the crisis, especially in the early stages of the pandemic. As highlighted, racial bias such as the refusal to serve Chinese tourists amplified the sense of risk and reduced the willingness to travel. Additionally, the pandemic reshaped consumer behaviour as Wen et al. (2021) noted that concerns about public health discouraged dining out, shifting preferences to contactless delivery and reduced social interactions.

These dynamics underscore the relationship between travel risk, management perception, and service delivery outcomes.

H$_3$. Tourists' travel risk and management perception significantly relate to service delivery.

4. Tourists' Travel Risk and Transportation Patterns

Covid-19 has significantly altered personal mobility and transportation preferences. While dining habits and social gatherings have changed, one of the most enduring transformations has been in tourists' transportation choices. Travellers have become increasingly cautious, avoiding crowded public transportation options due to fear of infection. According to Wen et al. (2021), tourists now prefer private modes such as car-pooling, rental vehicles, or bicycles, as these offer greater control over hygiene and social distancing. Bucsky (2020) also noted that public transport systems have been viewed as high-risk environments due to their enclosed spaces and high passenger density.

Travelers exhibit diverse behavioral patterns based on their perceptions of risk, as seen in cluster analyses during the COVID-19 pandemic (Brida et al., 2022). Parental concerns also influence family travel decisions in rural destinations (Sadeghloo et al., 2024), while tourists' attitudes toward destinations mediate the effects of motivation, image, and perceived risk in rural tourism contexts (Wanqi et al., 2024). Perception and mobility further define tourist behavior in popular destinations like Bali (Ramadhani et al., 2024) Additionally, factors such as uncertainty tolerance and travel experience significantly impact outbound travel intentions, particularly among Chinese tourists (Zhang & Hwang, 2025). These findings underscore the multifaceted interplay of psychological and contextual factors in contemporary travel decision-making.

This behavioural shift has led tourists to factor transportation accessibility, safety, and privacy into destination selection. Social distancing norms have made the availability of individual or semi-private travel modes more desirable (Bae & Chang, 2021). Moreover, destinations offering flexible, safe, and diverse transport options are seen as better managed and less risky. Management perception is thus linked with how well a destination adapts its transportation infrastructure to post-pandemic expectations (Abdou et al., 2023).

H$_4$. Tourists' travel risk and management perception are positively related transportation patterns.

5. Tourists' Travel Risk and Distribution Channel

A distribution channel serves as a bridge between service providers and end users, encompassing both online and offline agents that facilitate travel planning, bookings, and personalized packages. In the wake of Covid-19, travellers have increasingly turned to digital platforms for trip planning, seeking safe, contactless, and convenient alternatives. Online travel

agencies (OTAs) have emerged as crucial intermediaries in reducing physical interactions, offering digital booking systems that mitigate the risk of virus transmission (Gretzel et al., 2020). The pandemic has accelerated the digital transformation of travel distribution, where real-time information, virtual tours, and automated customer support influence destination decisions.

The COVID-19 pandemic has intensified the role of perceived risk in shaping travel and tourism behavior. Perceived health risks significantly influenced individuals' travel mode choices during the pandemic, leading to shifts in mobility preferences (Wang et al., 2024a). In the broader tourism context, risk perception combined with tourist ethnocentrism has impacted consumer decisions and industry dynamics (Bremser & Abraham, 2024). Moreover, in rural mountain tourism, social media and community participation played key roles in influencing tourist behavior, with perceived risk acting as a critical mediating factor (Hussain et al., 2024b). These studies collectively highlight how risk perception, social influence, and cultural attitudes intersect to shape travel decisions in times of crisis.

The behavioural shift also aligns with broader trends in e-commerce, work-from-home, remote learning, and online banking, reinforcing consumer trust in digital services (Rather, 2021). Websites such as MakeMyTrip and Booking.com allow tourists to compare fares, check safety protocols, read reviews, and manage itineraries, thereby enhancing perceived control and lowering perceived travel risks. Management perception as how well destinations are managing Covid-related safety and communication—also influences which distribution channels tourists prefer to use

H5. Tourists' travel risk and management perception significantly influence distribution channels.

6. Tourists' Travel Risk and Avoidance of Overpopulation destination

Covid-19, being a highly contagious virus transmitted through human contact, heightened global concerns around visiting crowded places. Tourist-heavy destinations such as the Maldives, Singapore, Rome, and Barcelona, once considered prime vacation spots, witnessed significant declines in tourist inflows due to perceived infection risks. The study by Wang & Ackerman (2019) emphasized that perceived health threats trigger behavioural responses such as travel postponement and destination avoidance. Similarly, Zenker & Kock (2020) explained that fear and uncertainty surrounding the pandemic led tourists to prefer isolated, nature-based, or less crowded destinations.

The COVID-19 pandemic has significantly transformed tourism dynamics, prompting a re-evaluation of sustainability, risk, and traveller perceptions. Residents in rural destinations have increasingly voiced concerns over overtourism, calling for more sustainable tourism models (Steber et al., 2024). Globally, tourism and trade landscapes have evolved in response to pandemic-induced disruptions (Yepez & Leimgruber, 2024). At a regional level, perceptions of travel risk and management among tourists, such as in Ilocos Norte, have shifted notably (Remollo et al., 2022). Motivational factors and emotional responses to travel, before, during, and after the pandemic that highlight a growing emphasis on sustainability (Papademetriou et al., 2025). Additionally, social crowding has been found to influence how travellers respond to destination advertising, impacting their relaxation or stress levels (Xue et al., 2024). Collectively, these studies underscore the pandemic's lasting impact on travel behavior, risk perception, and the future direction of sustainable tourism.

Overtourism has long been a challenge in global tourism, and the pandemic intensified the urgency to address it. Oklevik et al. (2019) noted that overcrowding not only degrades tourist experiences but also poses health and safety concerns. Management perception plays a critical role when tourists believe that destination managers are actively implementing crowd control, safety protocols, and visitor dispersion strategies, their willingness to travel improves.

H6. Tourists' travel risk and management perception significantly impact the avoidance of overpopulated destinations during the Covid-19 pandemic.

7. Tourists' Travel Risk and Hygiene and Safety

Hygiene and safety have emerged as critical determinants of travel behaviour, especially in the wake of the Covid-19 pandemic. Travellers have become increasingly vigilant about the cleanliness and safety protocols followed in public spaces, including transportation hubs, hotel lobbies, guest rooms, restaurants, and recreational facilities. To minimize virus transmission, the widespread adoption of face masks, hand sanitizers, and contactless services became the norm (Wen et al., 2021). The consistent use of masks and social distancing helped reduce infection risks and became symbols of hygiene-conscious destinations. Health and safety concerns have become central to tourist decision-making in the post-pandemic travel landscape. Tourists now closely evaluate health-safety risks when choosing destinations, with perceptions significantly influenced by the pandemic experience (Dalle Nogare & Scuderi, 2024). In Bangladesh, the assessment of tourism risk perception (TRP) reveals how local factors shape travellers' concerns (Islam et al., 2024), while in Vietnam, cluster analysis has been used to better implement tourist health safety strategies (Nguyen & Truong, 2024).

Tourists also increasingly consider health safety measures as integral to a destination's attractiveness (Roy et al., 2024). Furthermore, cultural factors such as ethnocentrism, coupled with perceived risk, continue to shape behaviors and preferences within the hospitality and tourism sectors (Bremser & Abraham, 2024). These studies collectively highlight the growing importance of health-related safety and risk perception in influencing modern tourism patterns.

Travellers now actively seek destinations that prioritize sanitation, medical preparedness, and visible enforcement of health guidelines. The perception of how well a destination is managed in terms of safety directly influences tourists' risk assessment and decision-making (Rather, 2021). Research indicates that inadequate hygiene standards lead to a decline in destination attractiveness and increased tourist anxiety (Bae & Chang, 2021). The hypothesis was thus framed to explore the extent to which perceived hygiene and safety, reinforced by destination management, impact tourists' travel risks and preferences.

H7. Tourists' travel risk and management perception significantly impact destinations' hygiene and safety.

Based on the literature review and hypothesis development, we developed a conceptual model which is presented in Figure 1.
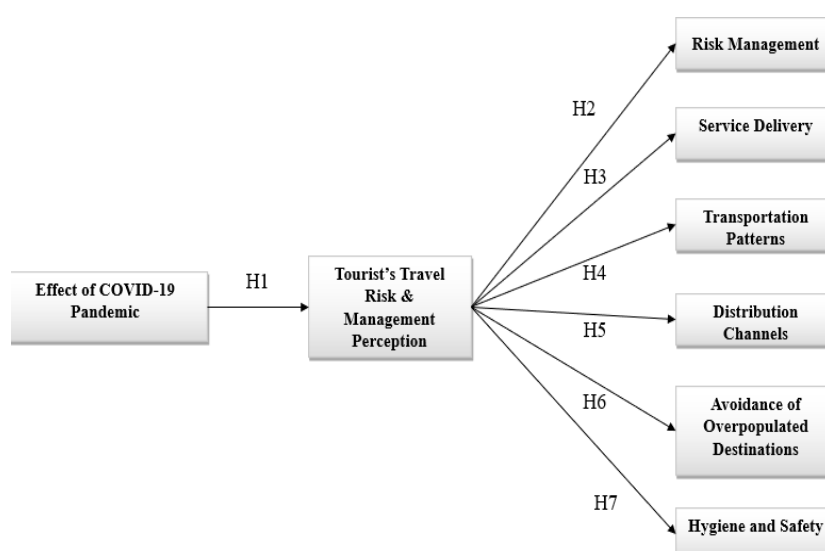
Figure 1. Conceptual Model (Source: Authors Own Model Development)

METHODS

1. Sample Design

The target population for this study consisted of individuals who frequently travel for leisure, business, or other purposes. Respondents were chosen from metropolitan areas with diverse travel behaviour. The sample was drawn using purposive sampling to ensure that only relevant and experienced travellers participated in the survey. Out of 530 distributed questionnaires, 508 valid responses were received, while 22 were excluded due to incomplete or inconsistent responses. This yielded a final response rate of approximately 95.8%. The sample comprised varied demographic backgrounds, including age, gender, occupation, and travel frequency, ensuring generalizability within the context of urban Indian travellers.

2. Survey Instrument

The survey considered various constructs such as the Covid-19 pandemic, tourists' travel risk and management perceptions, risk management, service delivery, transportation patterns, distribution channels, avoidance of overpopulated destinations, and hygiene and safety. The instrument was multidimensional and intended to explore the complex impact of Covid-19 on travel behaviours and industry responses. A structured questionnaire was designed in English and included both demographic questions and measurement items for the key constructs. The measurement items were primarily adapted from established literature to ensure validity. Items for the Covid-19 pandemic were based on El-Zoghby et al. (2020) and (Wen & Huang, 2019). Travel risk and management perception items were adapted from Wen & Huang (2019).

Risk management items were taken from Wen & Huang (2019). Service delivery and transportation patterns were measured using items from Wen & Huang (2019). Items for distribution channels were adapted from (Pourfakhimi et al., 2020, 2018; Wen & Huang, 2019). Avoidance of overpopulated destinations was measured using items developed by Lee (2020), while hygiene and safety measures were derived from Wen et al. (2021), and Esposito & Principi (2020).

Respondents were asked to rate their agreement with statements on a five-point Likert scale, ranging from "strongly disagree" to "strongly agree." On average, participants took 20 minutes to complete the 31-item questionnaire, which was distributed digitally via Google Forms on platforms like Facebook, WhatsApp, Instagram, and Telegram.

3. Instrument Designing

The items were pretested with a small group (n = 20) to ensure clarity, face validity, and logical flow. Based on the feedback, minor wording adjustments were made. Construct reliability was later assessed using Cronbach's alpha (see Table 2). All items met the standard reliability thresholds (> 0.7), and validity was confirmed through confirmatory factor analysis (CFA), ensuring that constructs accurately captured the intended phenomena (Hair et al., 2019).

4. Ethical Statement

The study followed all ethical research guidelines. Informed consent was obtained from all participants before data collection. The purpose of the study was clearly stated in the introduction section of the questionnaire. Participants were assured that their responses would remain confidential and used solely for academic research purposes. No personal identifying information was collected, and participation was entirely voluntary, with the option to withdraw at any point.

5. Common Method Bias

To mitigate potential common method bias (CMB), several procedural remedies were applied. Firstly, anonymity was assured to reduce social desirability bias. Secondly, the questionnaire structure ensured proximal and psychological separation of independent and dependent variables by randomizing question order. Thirdly, Harman's single-factor test was conducted, and results showed that a single factor did not account for most of the variance (< 50%), indicating that CMB was not a significant concern.

RESULTS

1. Correlation analysis

Table 1 presents the Pearson correlation coefficients among the eight variables examined in the study: Covid-19 Epidemic (ECP), Tourists' Travel Risk and Management Perception (TRMP), Risk Management (RM), Service Delivery (SD), Transportation Patterns (TP), Distribution Channels (DC), Avoidance of Overpopulated Destinations (AOD), and Hygiene and Safety (HAS). All correlations are significant at the 0.01 level (2-tailed), indicating a strong and statistically significant relationship among the variables (Table 1). The Covid-19 Epidemic (ECP) shows a very strong positive correlation with all other constructs, notably with Risk Management (RM) (r = .935), Tourists' Travel Risk and Management Perception (TRMP) (r = .932), and Avoidance of Overpopulated Destinations (AOD) (r = .926). This suggests that the perceived impact of the pandemic has a high association with how tourists perceive risk, the strategies used for risk mitigation, and decisions to avoid crowded destinations. Similarly, TRMP is strongly correlated with HAS (r = .919) and AOD (r = .911), implying that tourists' risk perceptions directly influence their sensitivity to hygiene and safety practices and their tendency to avoid overpopulated areas. Further, Risk Management (RM) shares very high correlations with HAS (r = .926) and DC (r = .910), showing that effective risk management is closely linked with perceptions of hygiene and the utilization of digital or physical distribution channels. All variables exhibit high inter-correlations, with coefficients ranging between .824 and .935, reflecting a tightly interconnected framework where improvements or shifts in one area (e.g., hygiene or service delivery) are likely to influence other components of tourist decision-making and destination management strategies. These strong associations confirm the conceptual framework's robustness and support the study's hypotheses regarding the interconnectedness of travel risk, management perception, and key decision-making factors in the tourism industry post-Covid-19 (Table 1).

Table 1. Correlation among the Studied Variables (Source: Correlation Analysis of the data acquired from the respondents by the authors using SPSS v27.0) (**Correlation is significant at the 0.01 level (2-tailed)

	ECP	TRMP	RM	SD	TP	DC	AOD	HAS
ECP	1	.932**	.935**	.909**	.848**	.914**	.926**	.925**
TRMP		1	.914**	.898**	.834**	.906**	.911**	.919**
RM			1	.899**	.844**	.910**	.928**	.926**
SD				1	.837**	.895**	.906**	.907**
TP					1	.824**	.839**	.846**
DC						1	.905**	.911**
AOD							1	.917**
HAS								1

2. Reliability analysis

The reliability estimates presented in Table 2 demonstrate the internal consistency of the measurement items used in this study, confirming the robustness of the survey instrument. The overall reliability coefficient (Cronbach's alpha) for the entire scale is 0.986, indicating excellent internal consistency across all constructs measured (Table 2).

Each individual construct also shows high reliability, with Cronbach's alpha values exceeding the commonly accepted threshold of 0.70 (Hair et al., 2019). Specifically, the Effect of Covid-19 Pandemic (ECP) consists of five items and records an alpha value of 0.936, reflecting strong consistency in the responses. Similarly, Travel Risk and Management Perception (TRMP) (α = 0.923) and Risk Management (RM) (α = 0.934) demonstrate excellent reliability. Constructs with fewer items such as Service Delivery (SD), Transportation Patterns (TP), and Distribution Channels (DC) also show satisfactory reliability, with alpha values of 0.895, 0.825, and 0.885 respectively.

Additionally, the constructs Avoidance of Overpopulated Destinations (AOD) and Hygiene and Safety (HAS) each have four items and show identical reliability values of 0.913, again suggesting strong item consistency. The mean and standard deviation values further reflect the central tendency and variability of responses across constructs, with all variables displaying moderate variability. These findings support the reliability of the measurement scales used and confirm the internal consistency of the constructs derived from prior literature (Table 2).

Table 2. Reliability Estimates of the Studied Variables (Source: Reliability Analysis of the authors' data acquired from the respondents using SPSS v27.0) (Note: ECO= Effect of Covid-19 Pandemic, TRMP= Travel Risk and Management Perception, RM= Risk Management, SD= Service Delivery, TP= Transportation Patterns, DC= Distribution Channels, AOD= Avoidance of Overpopulated Destinations, and HS= Hygiene and Safety)

Variables	No. of Items	Reliability α	Overall Reliability α = 0.986	
			Mean	SD
ECP	5	0.936	20.31	4.99
TRMP	4	0.923	16.24	4.03
RM	5	0.934	20.30	4.92
SD	3	0.895	12.20	3.00
TP	3	0.825	9.55	2.02
DC	3	0.885	12.16	2.99
AOD	4	0.913	16.22	3.86
HAS	4	0.913	16.26	3.88

3. Model fit indices

The model fit indices presented in Table 3 indicate an excellent overall fit of the structural models, both with and

without the mediator effect, based on standard thresholds recommended in the structural equation modelling (SEM) literature (Hair et al., 2019; Hu & Bentler, 1999). For the proposed model with the mediator effect, key fit indices such as the Goodness-of-Fit Index (GFI = 0.94) and Adjusted Goodness-of-Fit Index (AGFI = 0.92) are well above the recommended threshold of 0.90, suggesting strong model-data congruence. Similarly, the Comparative Fit Index (CFI = 0.99), Normed Fit Index (NFI = 0.97), and Tucker-Lewis Index (TLI = 0.99) all exceed the benchmark of 0.95, indicating an excellent fit. The Root Mean Square Error of Approximation (RMSEA = 0.025) is well below the cut-off of 0.05, confirming a close fit of the model to the data. The normed chi-square value (χ^2/df = 1.31) also falls within the acceptable range of 1 to 3, further supporting the model's adequacy (Table 3).

The proposed model without the mediator effect also shows comparably strong fit indices, with GFI = 0.94, AGFI = 0.93, and CFI = 0.99, indicating robustness. However, a slightly better Expected Cross-Validation Index (ECVI = 1.07) suggests that the model without the mediator may have a marginally better predictive accuracy. Overall, both models demonstrate excellent fit, but the model with the mediator shows slightly improved parsimony (PGFI = 0.81) and stability in explaining relationships among constructs, supporting its suitability for further analysis (Table 3).

Table 3. Overall fit indices for the Structural Model

Fit Indices	GFI	AGFI	PGFI	TLI	NFI	CFI	ECVI	RMSEA	χ^2 (df)	Normed χ^2
Proposed model (with mediator effect)	0.94	0.92	0.81	0.99	0.97	0.99	1.38	0.025	559.55 (427)	1.31
Proposed model (without mediator effect)	0.94	0.93	0.79	0.99	0.97	0.99	1.07	0.025	420.92 (318)	1.324

4. Regression estimates

The regression estimates presented in Table 4 provide strong empirical support for the hypothesized relationships in the proposed structural model. All seven hypotheses (H1 to H7) are statistically significant at $p < 0.01$, as indicated by high Critical Ratios (CR) and t-values, demonstrating robust path coefficients across the model (Table 4). Specifically, H1 confirms a strong positive relationship between the Effect of Covid-19 (ECO) and Travel Risk and Management Perception (TRMP), with a standardized regression estimate of 1.034, a CR of 26.812, and an R^2 value of 0.869, indicating that 86.9% of the variance in TRMP is explained by the Covid-19 effect. The beta value (.932) and t-value (57.83) further reinforce the strength of this relationship. H2 through H7 examine the influence of TRMP on various outcome variables. The relationship between TRMP and Risk Management (RM) (H2) is strong ($\beta = 0.914$, $R^2 = 0.836$), followed by its impact on Service Delivery (SD) (H3: $\beta = 0.898$, $R^2 = 0.807$), Transportation Patterns (TP) (H4: $\beta = 0.834$, $R^2 = 0.696$), Distribution Channels (DC) (H5: $\beta = 0.906$, $R^2 = 0.820$), Avoidance of Overpopulated Destinations (AOD) (H6: $\beta = 0.911$, $R^2 = 0.831$), and Hygiene and Safety (HS) (H7: $\beta = 0.919$, $R^2 = 0.844$). All estimates show high statistical significance with CR values above 26 and t-values exceeding 34, suggesting that TRMP is a critical predictor across all dependent variables.

These findings collectively demonstrate that travel risk and management perception (TRMP) play a central role in influencing key aspects of tourist behavior and destination management during the Covid-19 pandemic (Table 4). The high R^2 values across constructs reflect strong explanatory power, supporting the overall model robustness.

Table 4. Regression Estimates of the Structural Model (Default model) (Source: SEM Analysis of the authors' data acquired from the respondents using AMOS v21.0) (Note: C.R. and t-value is significant at *p < 0.01)

Hypotheses Associations		Estimate	SE.	CR.	R^2	Beta	t-value	Decision
H1	ECO → TRMP	1.034	.039	26.812*	.869	.932	57.83*	Accepted
H2	TRMP → RM	.909	.035	26.157*	.836	.914	50.78*	Accepted
H3	TRMP → SD	.974	.036	26.999*	.807	.898	45.95*	Accepted
H4	TRMP → TP	.987	.036	27.537*	.696	.834	34.06*	Accepted
H5	TRMP → DC	.918	.035	26.243*	.820	.906	48.02*	Accepted
H6	TRMP → AOD	.964	.035	27.386*	.831	.911	49.85*	Accepted
H7	TRMP → HS	.918	.035	26.581*	.844	.919	52.33*	Accepted

Table 5. Regression Estimates of the Proposed Model (Mediation Effects Constrained) (Source: SEM Analysis of the authors' data acquired from the respondents using AMOS v21.0) (Note: ECO= Effect of Covid-19 Pandemic, TRMP= Travel Risk and Management Perception, RM= Risk Management, SD= Service Delivery, TP= Transportation Patterns, DC= Distribution Channels, AOD= Avoidance of Overpopulated Destinations, and HS= Hygiene and Safety)

Hypothesis Associations		Estimate	SE.	CR.	Decision
H8a	ECO → TRMP → RM	.940	.037	25.561*	Accepted
H8b	ECO → TRMP → SD	1.008	.038	26.373*	Accepted
H8c	ECO → TRMP → TP	1.021	.038	26.846*	Accepted
H8d	ECO → TRMP → DC	.950	.037	25.683*	Accepted
H8e	ECO → TRMP → AOD	.997	.037	26.728*	Accepted
H8f	ECO → TRMP → HS	.951	.037	26.008*	Accepted

5. Mediation effects

The results presented in Table 5 provide compelling evidence for the mediating role of Travel Risk and Management Perception (TRMP) in the relationship between the Effect of Covid-19 (ECO) and multiple outcome variables. All six hypothesized mediation paths (H8a to H8f) are statistically significant at $p < 0.01$, as reflected by high Critical Ratios (CRs) ranging from 25.561 to 26.846, clearly supporting each proposed indirect relationship (Table 5). Specifically, the path ECO → TRMP → Risk Management (RM) (H8a) shows a strong standardized estimate of 0.940, indicating that the effect of the

Covid-19 pandemic on risk management practices is significantly mediated by tourists' perception of travel risk and management. Similarly, the mediation effects for Service Delivery (SD) (H8b: estimate = 1.008), Transportation Patterns (TP) (H8c: estimate = 1.021), and Distribution Channels (DC) (H8d: estimate = 0.950) confirm that TRMP plays a critical role in how Covid-related concerns translate into operational and behavioural changes in the tourism sector. Further, the impact of ECO on Avoidance of Overpopulated Destinations (AOD) (H8e: estimate = 0.997) and Hygiene and Safety (HS) (H8f: estimate = 0.951) is also significantly mediated by TRMP. These strong indirect effects indicate that travellers' perceptions during the pandemic substantially influence both their destination choices and their expectations around safety, service, and infrastructure.

Overall, Table 5 confirms that TRMP fully mediates the effect of the pandemic on key behavioural and management outcomes, reinforcing the centrality of perceived risk and management response in shaping post-Covid tourism dynamics.

DISCUSSION

The results of this study provide strong empirical support for all hypothesized relationships, confirming the substantial impact of Covid-19 on tourist behavior, particularly through the mediating role of Travel Risk and Management Perception (TRMP) (Yang & Wibowo, 2025). Each of the direct and mediated paths reflects the evolving dynamics of travel decision-making during and after the pandemic, offering theoretical and practical insights into the role of perceived risk and management responses. The significant positive association between the Effect of Covid-19 (ECO) and Travel Risk and Management Perception (TRMP) ($\beta = 0.932$) underscores how the pandemic heightened public sensitivity toward health risks in travel. These findings align with previous studies indicating that public health emergencies dramatically influence tourists' psychological evaluations of travel safety and managerial credibility (Salman et al., 2024; Wen et al., 2021).

The pandemic introduced uncertainty, leading tourists to scrutinize management practices such as hygiene protocols, communication, and contingency planning more critically (Bae & Chang, 2021; Pascual-Fraile et al., 2024; Salman et al., 2024). Similarly, Tourists' perception of travel risk significantly influenced their evaluation of risk management practices at destinations ($\beta = 0.914$). This finding supports the assertion that the ability of tourism stakeholders to mitigate perceived risks directly affects consumer confidence (Rather, 2021; Teng et al., 2023). In particular, crisis response capabilities and the communication of safety standards became critical in restoring trust. This reflects the growing expectation that tourism management not only acknowledges but actively manages emergent health threats (Jahari et al., 2023; Seyfi et al., 2023; Yang & Wibowo, 2025). Further, the link between TRMP and Service Delivery ($\beta = 0.898$) highlights the reconfiguration of service expectations post-Covid (Rahman et al., 2021). Tourists now expect contactless check-ins, personalized yet physically distanced services, and heightened cleanliness standards across all touchpoints (Devkota et al., 2022).

These results align with prior studies which found that tour operators and service providers must ensure consistent service quality and implement robust risk management strategies to address tourists' concerns (Gjerald & Lyngstad, 2015). These services included maintaining hygiene standards, providing safety information, and avoiding overpopulated destinations (Devkota et al., 2022; Nguyen & Truong, 2024; Rahman et al., 2021).

Safety-integrated service experiences are now considered a fundamental expectation rather than a luxury (Kaushal & Srivastava, 2021). The strong relationship between TRMP and Transportation Patterns ($\beta = 0.834$) indicates a behavioural shift in transport preferences. Tourists are likely to prefer transportation modes that they perceive as safer and less crowded, such as private cars and shared bikes, over public transport (Wang et al., 2024). Also, Wen et al. (2021) noted, tourists are increasingly opting for private or semi-private travel options like rental vehicles, car-pooling, or cycling to avoid crowd exposure (Pagliara et al., 2025). Bucsky (2020) also observed that public transportation was perceived as high-risk, prompting destination managers to diversify mobility options. Tourists now factor in the availability of safe, flexible transport when selecting a destination. Additionally, Economic, environmental, technological, psychological, and destination-specific aspects also shape transportation decisions (Pagliara et al., 2025).

The significant impact of TRMP on Distribution Channels ($\beta = 0.906$) confirms the accelerated digital transformation in tourism. Tourists' risk perception drives their information-seeking behavior, influencing how they interact with distribution channels (Muñoz-Mazón et al., 2021). They rely heavily on both online and offline sources to gather information about potential risks (Muñoz-Mazón et al., 2021). The pandemic amplified consumer dependence on digital platforms for booking, comparing safety features, and reading real-time reviews. As Gretzel et al. (2020) noted, OTAs and meta-search engines have become critical in bridging the trust gap between tourists and service providers. This shift also highlights how online distribution channels serve as proxies for managerial credibility and transparency. The positive association between TRMP and the Avoidance of Overpopulated Destinations ($\beta = 0.911$) illustrates a growing preference for low-density tourism environments. Zenker & Kock (2020) found that fear of infection significantly discouraged visits to traditionally crowded tourist hubs. Similarly, Oklevik et al. (2019) argued that overtourism now poses not only environmental but also epidemiological risks. The findings suggest that tourists seek destinations that actively manage crowd control and prioritize spatial distancing. The significant influence of TRMP on Hygiene and Safety ($\beta = 0.919$) reflects how public health consciousness has become central to destination appeal. Tourists now demand visible sanitation protocols, access to medical care, and adherence to global safety standards (Esposito & Principi, 2020). According to Gavurova et al. (2023), a destination's hygiene infrastructure significantly affects its post-pandemic competitiveness.

The mediation effects (H8a–H8f) demonstrate that TRMP fully mediates the relationship between the perceived impact of Covid-19 and key behavioural outcomes like risk management, service delivery, transportation, distribution, overcrowding, and hygiene. These findings reinforce the theoretical relevance of TRMP as a central mechanism through which the pandemic reshapes tourist behavior. Mediated relationships emphasize that the psychological processing of risk and not just the external event that drives decision-making (Huang et al., 2022; Neuburger & Egger, 2021).

1. Academic Implications

This study contributes significantly to the evolving body of literature on crisis-induced behavioural shifts in tourism. It provides empirical evidence supporting the role of Travel Risk and Management Perception (TRMP) as a mediating construct, offering new insights into how tourists cognitively process health risks in the travel context.

This aligns with the Pathogen Stress Theory, suggesting that perceived infection threats can reshape risk perception and behavior (Fincher & Thornhill, 2012). By integrating TRMP into the structural model, this research advances theoretical understanding of how external shocks like pandemics are internalized and translated into consumer behaviour. Moreover, it expands on earlier works (e.g., Bae & Chang, 2021; Wen et al., 2021) by validating these relationships in a developing economy context, such as India, where health infrastructure and policy communication play a more prominent role in shaping public confidence.

2. Managerial Implications

From a practical standpoint, the findings underscore the necessity for destination managers, policy makers, and tourism businesses to prioritize risk-sensitive planning and communication strategies. Tourism providers must not only implement rigorous health and safety protocols but also actively communicate these efforts through trusted digital channels to influence distribution and destination choice (Rather, 2021; Abbas et al., 2021). Clear signage, contactless services, mobile app integration, and real-time updates on hygiene practices are now expected elements of modern travel experiences. Managers should also rethink spatial design in public spaces, transportation, and service delivery to prevent overcrowding and foster safety. Investments in training frontline staff on crisis handling and guest assurance will further enhance trust. By aligning risk management strategies with consumer perceptions, tourism stakeholders can regain confidence, improve service satisfaction, and ensure long-term sustainability in the post-Covid era.

CONCLUSION

This study highlights that the Covid-19 pandemic has significantly influenced tourists' perceptions of travel risk and management, shaping behaviors related to transportation, distribution channels, hygiene, and destination choice. Heightened health concerns led to travel cancellations and increased demand for safety measures.

The findings offer valuable insights for tourism stakeholders to rebuild traveler confidence through improved crisis preparedness and communication. Behavioral shifts such as preference for less crowded destinations and health-focused travel suggest a move toward more selective and cautious tourism.

However, the study has limitations, including reliance on self-reported data and a demographically skewed sample. Future research should adopt mixed methods to capture deeper insights and develop more robust measurement instruments. Despite these limitations, the study contributes to the understanding of pandemic-driven behavioral changes and supports the development of adaptive strategies for tourism recovery in the face of public health crises.

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