

Article

Chinese Tourists' Health Risk Avoidance Behavior in the Context of Regular Epidemic Prevention and Control: An Empirical Analysis

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Abstract: The health risk avoidance behavior of tourists in China, a country actively combating COVID-19, is of research significance. This study proposes and tests a model based on three theories—stimulus-organism-response model, motivation-opportunity-ability model, and health belief model—to examine the impact mechanism of tourists' health risk avoiding behavior under COVID-19's regular epidemic prevention and control situations and the moderating effect of health risk perception. The results reveal that, from the stimulus perspective, tourists' motivation, opportunities to travel, and the ability to travel negatively affect tourists' health risk avoidance behavior. That is to say, the stronger the motivation of tourists to undertake tourist activities, the stronger the safeguards provided by the government, and the better that tourists are informed of the virus and more equipped with healthy habits and skills, the more likely it is that tourists will not take avoidance behavior. From the organism perspective, perceived severity and perceived susceptibility, as mediating factors, positively influence tourists' health risk avoidance behavior. In contrast, if tourists are more likely to believe in the controllability of the health risk of the epidemic, then they are more likely to travel and less likely to show avoidance behavior. Managerial implications and theoretical contributions are also provided.

Keywords: COVID-19; regular prevention and control; health risk perception; avoidance behavior; influencing mechanism



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1. Introduction

Most tourists' essential prerequisite and basic condition is to ensure safety [1]. As the main consumers of tourist activities, tourists tend to resort to self-protective behavior to lower health risks [2]. Generally, they are likely to make the least risky decisions [3]. However, the world is facing huge tourist and health risks because of COVID-19, which has disrupted people's normal lives in China, thus changing their risk perceptions and decision-making behavior toward travel [4]. As the recurrent and persistent pandemic poses health risks to people's mental and physical health, tourists pay more attention to their health conditions on the road. Infection avoidance, health management, and risk prevention during the epidemic have become major concerns for tourists, tourism-related enterprises, and relevant government departments [5,6].

Since the pandemic outbreak at the beginning of 2020, countries have adopted different strategies to cope with the virus, and China has chosen to actively combat it. For example, it formulated the dynamic zero-COVID policy on 11 December 2021, which means that, in the current situation, when locally transmitted cases are confirmed, China takes comprehensive prevention and control measures to quickly contain the outbreak. Under the guidance of sustained and proactive policies, China has effectively controlled COVID-19, downgrading the status of prevention and control from "emergency management" in early 2020 to the

present “regular prevention and control,” with people gradually returning to normal life. Thus, China has become an exemplar worldwide in terms of epidemic prevention and control [7]. This raises a major question: How do Chinese tourists, against the backdrop of regular prevention and control, develop perceptions and avoidance behaviors towards health risks? Do Chinese tourists display new behavioral characteristics?

Many studies have examined the impact of tourists’ risk perceptions on behavioral intention [8,9], most of which adopt social psychology as the main perspective, focusing on geological disasters and travel types in a variety of tourist destinations [10–13], with risk perception as the main variable in tourists’ decision-making behavior, to explore the structural relationships and influencing mechanisms between risk perception and tourist behavior [14,15]. However, there is a paucity of extensive research on antecedent factors in the context of the epidemic. Although some studies have focused on tourists’ health risk perceptions, relevant research has focused on fields such as tourism safety and medicine, covering possible health risks and influencing factors in tourism [16,17], tourism-related pathological analysis, suggestions for travel, and preventive and treatment measures [18,19]. In terms of theoretical methods, there is no literature integrating S-O-R, MOA and HBM, but some scholars have integrated SOR and MOA or combined other models to conduct research via quantitative or qualitative methods. Liu and Shi [20] took SOR as a framework, integrated MOA and TAM and confirmed that, under the background of the epidemic, consumers’ perception of sports tourism risk is higher, while their intention to consume sports tourism is lower. Jia and Xiong [21] explored the influence mechanism of knowledge exchange and sharing in a virtual academic community by integrating SOR and MOA. The study found that the perception of information exchange, motivation, knowledge quality, social influence and professional skills, and self-efficacy positively affect perception, which in turn has a positive impact on willingness. Arora et al. [22] took qualitative research methods, integrating a SOR-MOA framework and SAP-LAP model, to analyze shoppers’ justification for showrooming behavior. Thus, it is imperative to develop a systematic and integrated research framework [23] to study the mechanisms of action among tourists’ health risk perceptions, avoidance behavior, and variables in different countries and cultures in the wake of the pandemic [5,24].

Previous studies have shown that travel motivation, trust in government, and health literacy are important factors influencing people’s health risk avoidance behavior [25–27], which can be interpreted by Motivation-Opportunity-Ability (MOA), suggesting that an individual’s behavior is induced by a combination of three factors: intrinsic motivation, external opportunity, and personal ability [28,29]. Tourists’ perceptions of severity and susceptibility also have a significant impact on their decision-making [30,31], which can be explained by the health belief model (HBM), one of the most prominent social behavior models used to explain health behavior. The model is often used to predict individual behavior in avoiding an array of health risks [32]. In terms of predicting tourists’ behavior, the stimulus-organism-response model (S-O-R) is one of the most widely used; it classifies tourists’ behavior into stimulus and response, and posits that the behavior is induced by the stimulus [33,34]. These three models are empirically tested theoretical frameworks that are often used to analyze health-related behavior [20,35]. Furthermore, the three models emphasize the importance of various factors in predicting individual behavior from different perspectives, which are complementary to each other to some extent. Their integration, as an important theoretical basis for explaining tourist behavior, can significantly explain it.

Based on this, the present study, with S-O-R as its research framework, integrates MOA and HBM to interpret the internal logic of the risk perceptions and avoidance behavior of tourists in China against the backdrop of the regular prevention and control of COVID-19. In addition, it investigates the mediating role of health risk perception and enriches the research on the antecedent mechanisms of tourists’ health risk avoidance behavior to provide a reference for the management of public health events and risks, thus reducing health risks and psychological pressure on tourists during the pandemic and promoting the recovery and sustainable development of the tourist market.

2. Theoretical Background

2.1. Theory of Stimulus-Organism-Response

S-O-R, first proposed by environmental psychologists Mehrabian and Russell [34], is a theoretical model used to investigate the mechanisms of internal and external stimuli on individual cognitive or psychological responses and to predict individual behavior on this basis. S-O-R is mainly applied in studies of consumer buying behavior, in which S refers to the stimuli generated by individual physiological and psychological factors, as well as the external environment, and O represents consumers' perceptions and reactions triggered by S, which in turn drives consumers to make final purchasing decisions and implement consumption behavior (R).

Recently, scholars have employed S-O-R to research tourist behavior [20,36,37]. For example, Kim et al. [36] confirmed that real experiences significantly affect perception and emotional responses and are important mediators in predicting attachment and willingness to travel. Lee et al. [37] found that environmental stimuli (S) directly or indirectly influence tourists' intentions to shop (R) through changes in tourists' intrinsic organisms (O). Liu and Shi [20] integrated MOA and TAM and confirmed that tourists' perceived risks play a negative constraining role in consumption behavior.

2.2. Motivation-Opportunity-Ability Model

Macinnis and Jaworski [38] first used MOA to study the behavior of information processing, arguing that three factors—individual motivation, opportunity, and ability to process information—work together to trigger responses to advertising. The model suggests that individual behavior is jointly influenced by intrinsic motivation (M), external opportunity (O), and personal ability (A) [39]. MOA is widely used in studies of individual behavior across different disciplines to interpret individual behavior from psychological and situational perspectives.

Recently, MOA has been applied to individual behavior research in tourism [40–42]. Hung et al. [41] first introduced MOA into tourism research and found that community residents' participation in tourist development is determined by their motivation, opportunity, and ability. Jepson et al. [42] used MOA to explore the facilitators and hindering factors of community participation in festival tourism. Bi et al. [40] analyzed the influence of motivation, opportunity, and ability on tourists' uncivilized behavior based on MOA in order to explore the mechanism of such behavior.

2.3. Health Belief Model

In the 1850s, social psychologists in US public health agencies developed the HBM to understand why people reject disease prevention or early disease screening [32]. Subsequently, the constantly refined and developed HBM has been gradually applied in medical research to investigate patients' behavior and reactions to health-related issues [43,44].

The HBM has become one of the most commonly used models in health-related research to explain and predict human health practices and health-related avoidance behavior [45,46]. It assumes that individuals take measures such as prevention and control to avoid or reduce health risks when they identify a high possibility of contracting a disease (perceived susceptibility) that has a severe negative impact (perceived severity), and the benefits of avoidance outstrip the barriers (perceived benefit) [47]. A study verified that perceived susceptibility, perceived severity, and perceived benefit are antecedent influences on individuals' health-promoting behaviors such as avoidance, taking Tibet, a high-altitude tourism destination in China, as an example [35].

3. Hypotheses Development

First, the present study uses S-O-R as the main research framework, holding that tourists are stimulated by a combination of internal and external factors to generate psychological changes in response to health risks, driving them to exhibit a range of some kind of avoidance behaviors toward health-risk-related tourist activities. Second, from a

broad perspective, MOAs are considered to be the internal stimuli that trigger a certain behavior of individuals, situational factors affecting individuals' behavior, and the potential of an individual to act, involving knowledge, habits, skills, and other aspects. Thus, this study incorporates MOA into the S framework and conducts an in-depth and systematic analysis of the internal and external stimuli of tourists' health risk avoidance behavior from this perspective. Third, the perceived susceptibility, severity, and controllability of the HMB model were adopted in the O framework to explain the psychological cognition of individuals. In this study, the variables of travel motivation and ability to travel somewhat overlapped with perceived benefit, so the variable of perceived benefit was not included in the current model. Tourists influenced by S and O may show a range of avoidance behaviors, which is the response of individual health risk avoidance behavior in the R part.

3.1. Hypotheses Based on HBM

Perceived susceptibility refers to an individual's estimate of the likelihood that an activity will incur health risks [48]. Many studies have suggested that perceived risks are positively correlated with the health behavior of individuals, and individuals take measures to lower the risks [49,50]. When individuals reckon that disease is easily transmitted or they might be infected, their willingness will be hampered [51]. In the field of tourism, the higher the level of perceived susceptibility to potential risks, the more likely tourists will act defensively to reduce health risks [23]. Hence, we propose the following hypothesis:

Hypothesis 1 (H1). *Tourists' perceived susceptibility to health risks positively influences avoidance behavior.*

Perceived severity refers to an individual's subjective assessment of the possible clinical or social consequences of undertaking an activity, as perceived by the individual [48]. People take action to prevent or control the occurrence of a disease if they think it has potentially serious consequences [52]. The pandemic has induced fear of travel in some people, resulting in avoidance behavior, such as delaying travel [5,15]. The higher the level of perceived severity of the pandemic, the more likely tourists are to engage in positive health behaviors [53]. Hence, we propose the following hypothesis:

Hypothesis 2 (H2). *Tourists' perceived severity of health risks positively influences avoidance behavior.*

Perceived controllability can be interpreted as an individual's subjective feelings regarding the degree of control over the prevalence and transmission of an epidemic [54]. There is a correlation between perceived controllability of the disease and individuals' health behavior [54]. Studies have shown that, during the SARS epidemic in 2003, people experienced "emotional stress", leading to self-defensive behavior in response to environmental challenges [55]. Thus, this study introduced perceived controllability into the model framework, suggesting that tourists' perceived health risks will influence their intentions regarding avoidance behavior if they are aware that the transmission is difficult to contain or if there are consequences beyond their control, such as contracting COVID-19 on the trip, which is difficult to treat. Hence, we propose the following hypothesis:

Hypothesis 3 (H3). *Tourists' perceived controllability of health risks negatively influences avoidance behavior.*

3.2. Hypotheses Based on MOA

- **Motivation (M)**

Motivation is one of the key indicators of the MOA model and is related to an individual's willingness, wish, and interest in performing a behavior, which is an important factor influencing an individual's behavior [56]. Motivation drives individuals to shift from a static to an active state, resulting in dynamic behavior with certain directivity [57]. Studies

have shown that tourists' motivations directly drive their behavior [58]. The stronger the motivation, the more likely it is that a tourist will decide to participate in an activity [59,60]. The relationship between people's travel motivations and health risk avoidance behavior in the context of the epidemic needs to be further tested, and the following hypothesis is proposed:

Hypothesis 4 (H4). *Tourists' travel motivation negatively influences avoidance behavior.*

Motivation, as an external variable, negatively influences the severity and susceptibility of individuals' risk perceptions [61,62], and positively influences controllability [63]. In addition, the stronger an individual's motivation for a behavior, the more likely it is that they will reduce the risk-related perception and assessment and be more willing to take a certain degree of risk in terms of health, money, and time to satisfy their intrinsic needs [64]. According to media reports, during the Chinese National Day holiday in 2020, which was the first long holiday during which people were allowed to travel normally, some scenic spots witnessed a surge in the number of tourists. The number of tourists nationwide has hit 637 million, a year-on-year recovery of over 70% [65]. Hence, the following hypotheses are proposed:

Hypothesis 5 (H5). *Tourists' travel motivation negatively influences the perceived severity of health risk.*

Hypothesis 6 (H6). *Tourists' travel motivation negatively influences their perceived susceptibility to health risks.*

Hypothesis 7 (H7). *Tourists' travel motivation positively influences their perceived controllability of health risks.*

- Opportunity (O)

Opportunity can be interpreted as factors in the external environment perceived by an individual as a driving force of a behavior at a given time and in a particular space; it features objectivity, favorability, and benefit [66]. Opportunity is closely related to the objective external environment, and underlines the factors perceived by individuals that drive them to perform a behavior in the objective external environment. In light of the objectives of this study, opportunity refers to the influence of the objective external environment, such as government support in policies channeling and guaranteeing certain dimensions, on tourists' health risk avoidance behavior in the context of regular prevention and control of COVID-19. Studies have shown that government support positively influences tourists' participation in tourist activities [20,67]. Hence, we propose the following hypothesis:

Hypothesis 8 (H8). *Tourists' opportunities to travel negatively influence their avoidance behavior.*

Remarkable achievements have been made in China in terms of epidemic prevention and control, setting an example for the rest of the world [7]. Chinese residents are highly satisfied with measures to contain the virus. Residents' satisfaction with community prevention and control work is negatively correlated with their inner pressure, and the improvement of such work can considerably consolidate their sense of security [68]. Therefore, the Chinese government's policy in channeling and guaranteeing support for tourism and other supporting measures can be regarded as an opportunity for tourists to carry out health risk perceptions. As a result, tourists' mental pressure to participate in activities decreases with their belief that the pandemic is gradually less severe, individuals are less likely to be infected, and the government is able to control the transmission. Hence, the following hypotheses are proposed:

Hypothesis 9 (H9). *Tourists' opportunities to travel negatively influence the perceived severity of health risk.*

Hypothesis 10 (H10). *Tourists' opportunities to travel negatively influence their perceived susceptibility to health risk.*

Hypothesis 11 (H11). *Tourists' opportunities to travel positively influence their perceived controllability of health risks.*

- Ability (A)

Ability refers to the subjective conditions necessary for an individual to display a behavior, including intellectual and physical abilities [39]. Health literacy (HL), commonly used in medical research to measure an individual's ability to maintain health, refers to the ability to acquire, understand, and process health information or services and to make decisions that benefit health [69]. If a person has health literacy, it means that he has health knowledge, healthy behavior habits and the ability to maintain health. Besides, it influences behavioral decisions and lifestyles and has a positive impact on health. A higher level of HL motivates health-boosting behavior [70] rather than health-undermining behavior [27,71,72]. According to experimental research conducted by Dominick et al. [73] on Latino populations in the US, better HL improves individuals' perceptions of factors such as risks. Hence, the following hypotheses are proposed:

Hypothesis 12 (H12). *Tourists' abilities to travel negatively influence health risk avoidance behavior.*

Hypothesis 13 (H13). *Tourists' abilities to travel negatively influence the perceived severity of health risks.*

Hypothesis 14 (H14). *Tourists' ability to travel negatively influences their perceived susceptibility to health risks.*

Hypothesis 15 (H15). *Tourists' ability to travel positively influences their perceived controllability of health risks.*

In summary, this study constructs the following theoretical model (Figure 1).

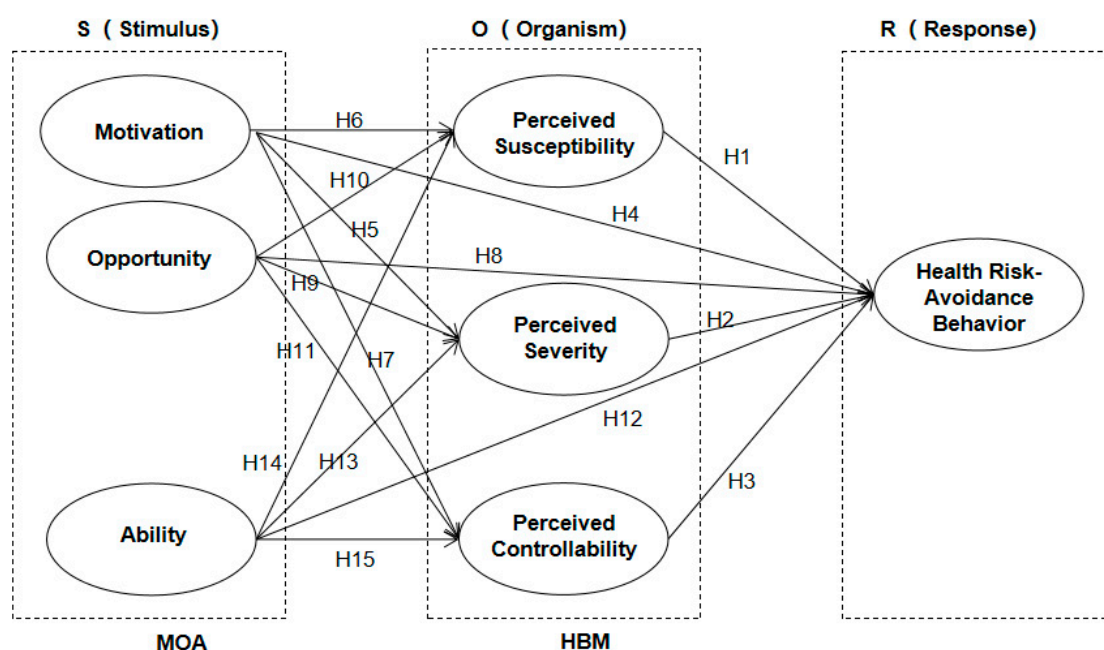


Figure 1. Theoretical model.

4. Methodology

4.1. Measurement

In the questionnaire, items about perceived severity were mainly based on the studies of Becker et al. [74], Jones et al. [75], and Dai et al. [54]. Items about perceived susceptibility were based on the studies of Huang et al. [35] and Dai et al. [54]; and items about perceived controllability were based on the studies of Dai et al. [54]; there were nine items in total. The measurement of travel motivation was based on Cohen's study [26], which includes five dimensions and 15 items. Six items about opportunity and ability were mainly based on the studies of Liu and Shi [20] while three items about health risk avoidance behavior were based on the studies of Zhang and Yu [76]. We translated the scales in foreign languages into Chinese and made repeated comparisons to avoid ambiguities. We confirmed that the translated versions reflect the meanings and intentions of the original versions. On this basis, two PhD students in tourism management and three professors in the field of tourism safety, health and medicine, and tourist behavior, respectively, were invited to revise the questions in the context of regular epidemic prevention and control. A five-point Likert scale was adopted in this study, with five levels ranging from 1 to 5. In addition, respondents were surveyed in terms of basic demographic characteristics, such as gender, age, education, annual income, and other basic information, such as health status, purpose of travel, and place of origin. The questionnaire is presented in Appendix A.

4.2. Data Collection and Analysis

Chinese tourists who had traveled and those who had not traveled during regular epidemic prevention and control (after 2020) were selected as respondents. The reasons are twofold. First, as a country that is actively containing COVID-19, China has taken a series of measures under the leadership of the CPC Central Committee, setting an example for the rest of the world [7], which is of research significance. Second, Chinese tourists, influenced by distinctive Chinese culture, have profound content in approaches to health risk avoidance, such as wearing masks in public places, using serving chopsticks, staggered travel and reservations at scenic spots, which are of great practical value to the study of Chinese tourists' health behavior. The survey was conducted between December 2021 and January 2022. Owing to the impact of the pandemic, the questionnaire was distributed online through China's largest questionnaire website, Questionnaire Star (Wenjuanxing in Chinese), using snowball sampling, with respondents filling out the questionnaire and recommending it to others.

A total of 916 questionnaires were collected. Of these, 828 were valid after irregular items, such as those with identical answers and contradictory items, were excluded, accounting for 90.3% of the total. Among the valid samples, men and women made up 52.5% and 47.5%, respectively. The average age was 34.12, with a median of 33. In terms of health status, 53.26% of the samples were good. In terms of education, undergraduate degrees comprised 33.45%, which was the largest proportion and 22.22% were employees of large state-owned enterprises. Over 30% of the sample had a monthly income between RMB 6000 to 8000. Regarding the question "Have you traveled since the outbreak of the pandemic," 50% selected yes and 50% selected no.

IBM SPSS AMOS 25.0 was used in the data screening and assessment process. First, Cronbach's alpha, exploratory factor analysis, and confirmatory factor analysis were used to test the reliability and validity of potential variables. Notably, half of the data were used for exploratory factor analysis and the remaining data were used for confirmatory factor analysis. Second, a structural equation model and bootstrap method were used to test the relationships between the potential variables, including the fit of the structural model and the significance of the influence relationship. Finally, a multigroup analysis was used to test the constancy of the measurement and structural models.

5. Results and Analysis

5.1. Reliability Analysis

First, the data collected from the questionnaires were processed and analyzed. We found that the overall Cronbach's alpha coefficient value of the scale was greater than 0.7, with the corresponding Cronbach's alpha coefficient values of the 11 dimensions all being greater than 0.7, indicating that the internal consistency of the questionnaires was good [77]. Thus, the reliability of the results of this survey was excellent (Table 1). To identify the correlation between each item and the population, we removed items with a correlation coefficient lower than 0.3 from the questionnaire. The correlations between the items in this questionnaire and the population after reliability test analysis were all higher than 0.3, indicating that most of the items were correlated with the population.

Table 1. Reliability Analysis of the Questionnaire.

Variable	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha If Item Deleted	Cronbach's Alpha	Total Cronbach's Alpha
PS1	6.492	7.721	0.820	0.882	0.914	0.730
PS2	6.681	6.433	0.858	0.855		
PS3	6.487	7.844	0.815	0.887		
PV1	6.585	7.803	0.835	0.887	0.919	
PV2	6.599	7.817	0.837	0.885		
PV3	6.773	6.471	0.855	0.877		
PC1	6.171	5.750	0.690	0.799	0.842	
PC2	6.054	4.530	0.760	0.734		
PC3	6.245	5.702	0.689	0.799		
SAM1	6.905	5.385	0.683	0.778	0.832	
SAM2	6.829	5.547	0.670	0.792		
SAM3	6.627	4.374	0.739	0.726		
ERM1	6.884	4.898	0.679	0.746	0.819	
ERM2	6.627	4.307	0.699	0.727		
ERM3	6.861	5.106	0.648	0.777		
SCM1	6.560	4.355	0.709	0.733	0.824	
SCM2	6.709	5.111	0.685	0.753		
SCM3	6.682	5.354	0.657	0.782		
ASM1	6.885	4.938	0.659	0.770	0.821	
ASM2	6.675	4.149	0.707	0.724		
ASM3	6.850	4.913	0.667	0.762		
EPM1	6.813	5.386	0.668	0.779	0.827	
EPM2	6.617	4.399	0.726	0.723		
EPM3	6.800	5.314	0.670	0.776		

5.2. Exploratory Factor Analysis

The KMO value was used to determine the suitability of the extracted information, and the communality value was used to exclude unreasonable items. The explained variance ratio was used to indicate the level of information extraction, and factor loading was used to measure the correspondence between the factors (dimensions) and items of the questionnaire. As shown in Table 2, the communality values of all items were greater than 0.4, which means that information about the items could be effectively extracted. The KMO value was 0.938, which was greater than 0.7, and the Bartlett's Test of Sphericity was significant at $p = 0.000$ (p -value < 0.05 is recommended level), indicating that information could be effectively extracted from the data. The explained variance ratios of the 11 factors were 7.936, 7.804, 7.782, 7.774, 7.024, 7.010, 6.918, 6.855, 6.822, 6.790, and 6.753%, respectively, and the rotated cumulative explained variance ratio was 79.469% ($>60\%$), implying that the amount of information in the items could be effectively extracted.

Table 2. Validity Analysis of the Questionnaire.

Items	Factor Loading (CFA)											Communality
	1	2	3	4	5	6	7	8	9	10	11	
Eigen value (Unrotated)	12.828	2.556	1.492	1.416	1.396	1.216	1.129	1.099	1.069	1.022	1.003	-
% of Variance (Unrotated)	38.87%	7.75%	4.52%	4.29%	4.23%	3.68%	3.42%	3.33%	3.24%	3.10%	3.04%	-
Cumulative % of Variance (Unrotated)	38.87%	46.62%	51.14%	55.43%	59.66%	63.34%	66.76%	70.10%	73.33%	76.43%	79.47%	-
Eigen value (Rotated)	2.619	2.575	2.568	2.566	2.318	2.313	2.283	2.262	2.251	2.241	2.229	-
% of Variance (Rotated)	7.94%	7.80%	7.78%	7.77%	7.02%	7.01%	6.92%	6.86%	6.82%	6.79%	6.75%	-
Cumulative % of Variance (Rotated)	7.94%	15.74%	23.52%	31.30%	38.32%	45.33%	52.25%	59.10%	65.93%	72.72%	79.47%	-
KMO	0.938											-
Bartlett's Test of Sphericity	18,257.69											-
df	528											-
p value	0											-

Based on the meaning of the questions in the scale and the rotated component matrix, a factor loading greater than 0.5 indicates that the question can be analyzed as a significant item. The results show that the factor loading for each dimension was greater than 0.5. Additionally, the results obtained by rotating the component matrix were consistent with the scales and dimensions classified in the research design (Table 2). Therefore, the questionnaire was deemed to be valid.

5.3. Confirmatory Factor Analysis

To further verify the validity of the variables, confirmatory factor analysis was conducted on the data using AMOS. As shown in Table 3, the model fit indices of CMIN/DF, NFI, IFI, TLI, CFI, GFI, and RMSEA met the criteria (CMIN/DF = 1.414, NFI = 0.966, IFI = 0.990, TLI = 0.988, CFI = 0.990, GFI = 0.957, and RMSEA = 0.022); therefore, the model fit was good.

Table 3. Model Fit Indices.

CMIN	df	CMIN/DF	NFI	IFI	TLI	CFI	GFI	RMSEA
621.966	440.000	1.414	0.966	0.990	0.988	0.990	0.957	0.022
Suggested value		<3	>0.8	>0.9	>0.8	>0.9	>0.8	<0.08

Table 4 shows that the coefficient estimates corresponding to variables passed the significance test ($p < 0.05$) and the corresponding factor loadings were greater than 0.6, which met the criteria. In addition, this study used composite reliability (CR) and average variance extracted (AVE) as the criteria for evaluating convergent validity [78]. Convergent validity is usually considered good when the CR of each factor is greater than 0.7 and AVE greater than 0.50. When the square root of the AVE of each factor is greater than each factor's correlation coefficient, the model has good discriminant validity.

Table 4. Confirmatory factor analysis.

Variable Relations			Estimated Coefficient	Std. Error	CV	<i>p</i>	Factor Loadings
PS1	←	Perceived severity	1.000	0.000	0.000	0.000	0.875
PS2	←	Perceived severity	1.211	0.033	36.311	***	0.915
PS3	←	Perceived severity	0.979	0.029	33.461	***	0.868
PV1	←	perceived susceptibility	1.000	0.000	0.000	0.000	0.885
PV2	←	perceived susceptibility	0.996	0.028	35.707	***	0.885
PV3	←	perceived susceptibility	1.211	0.032	37.418	***	0.910
PC1	←	perceived controllability	1.000	0.000	0.000	0.000	0.784
PC2	←	perceived controllability	1.289	0.053	24.298	***	0.851
PC3	←	perceived controllability	1.003	0.045	22.519	***	0.778
SAM1	←	Social affective motivation	1.000	0.000	0.000	0.000	0.772
SAM2	←	Social affective motivation	0.964	0.045	21.383	***	0.761
SAM3	←	Social affective motivation	1.278	0.055	23.316	***	0.848
ERM1	←	Escape release motivation	1.000	0.000	0.000	0.000	0.789
ERM2	←	Escape release motivation	1.114	0.051	21.859	***	0.790
ERM3	←	Escape release motivation	0.939	0.045	21.000	***	0.754
SCM1	←	Stimulating challenge motivation	1.000	0.000	0.000	0.000	0.801
SCM2	←	Stimulating challenge motivation	0.873	0.038	22.802	***	0.797
SCM3	←	Stimulating challenge motivation	0.802	0.037	21.572	***	0.752
ASM1	←	Achievement satisfaction motivation	1.000	0.000	0.000	0.000	0.768
ASM2	←	Achievement satisfaction motivation	1.182	0.055	21.663	***	0.798
ASM3	←	Achievement satisfaction motivation	1.006	0.048	21.114	***	0.773
EPM1	←	External propaganda motive	1.000	0.000	0.000	0.000	0.768
EPM2	←	External propaganda motive	1.234	0.055	22.439	***	0.817
EPM3	←	External propaganda motive	1.024	0.048	21.498	***	0.776
TO1	←	Travel opportunities	1.000	0.000	0.000	0.000	0.888
TO2	←	Travel opportunities	0.991	0.027	36.680	***	0.885
TO3	←	Travel opportunities	1.187	0.029	40.483	***	0.935
TA1	←	Tourists' abilities	1.000	0.000	0.000	0.000	0.885
TA2	←	Tourists' abilities	1.169	0.030	39.176	***	0.930
TA3	←	Tourists' abilities	1.010	0.029	35.174	***	0.874
RAB1	←	Risk avoidance behavior	1.000	0.000	0.000	0.000	0.763
RAB2	←	Risk avoidance behavior	1.063	0.048	22.051	***	0.780
RAB3	←	Risk avoidance behavior	1.431	0.060	23.959	***	0.864

Note: *** $p < 0.001$.

As shown in Table 5, the basic average variance extracted (AVE) values of all dimensions were greater than 0.5, and the CR values were greater than 0.7, indicating that this dimension had good convergent validity. According to discriminant validity, the square root of the AVE was greater than the correlation coefficient with the other factors; therefore, the discriminant validity between the factors within each variable was good.

5.4. Correlation Analysis

As shown in Table 6, correlation analysis was used to investigate the correlation between the variables, and the Pearson correlation coefficient was used to indicate the degree of correlation. The values of the correlation coefficients between the variables were significant. Against the backdrop of regular epidemic prevention and control and from the stimulus perspective, tourists' motivation to travel was at a relatively high level, with the mean value of the subjects' perceived motivation to travel ranging from 3.325 to 3.402. Among these, the mean value of the motivation for achievement satisfaction was the highest of all the variables, indicating that tourists recognize the positive value achieved and gained from post-pandemic travel. The mean value of perceived opportunity to travel was 3.316, indicating that tourists did not have strong perceptions of the support provided by the government and relevant enterprises through tourism policies and guarantees in terms of channels and services in the context of regular epidemic prevention and control in China. The mean value of perceived ability to travel is 3.349, indicating that tourists need to further consolidate their knowledge, essential behavior, and habits, as well as skills in maintaining health when traveling amid regular epidemic prevention and control.

Table 5. Convergent validity and discriminant validity.

Variable	CR	AVE	1	2	3	4	5	6	7	8	9	10	11
Perceived severity	0.917	0.786	0.886										
perceived susceptibility	0.922	0.798	0.553 ***	0.894									
perceived controllability	0.847	0.649	−0.524 ***	−0.479 ***	0.805								
Social affective motivation	0.836	0.631	−0.453 ***	−0.400 ***	0.455 ***	0.794							
Escape release motivation	0.821	0.605	−0.406 ***	−0.452 ***	0.468 ***	0.568 ***	0.778						
Stimulating challenge motivation	0.827	0.614	−0.419 ***	−0.461 ***	0.501 ***	0.590 ***	0.628 ***	0.784					
Achievement satisfaction motivation	0.823	0.608	−0.435 ***	−0.460 ***	0.474 ***	0.625 ***	0.605 ***	0.608 ***	0.780				
External propaganda motivation	0.830	0.620	−0.463 ***	−0.447 ***	0.501 ***	0.597 ***	0.616 ***	0.642 ***	0.616 ***	0.787			
Travel opportunities	0.930	0.815	−0.482 ***	−0.523 ***	0.553 ***	0.404 ***	0.418 ***	0.435 ***	0.418 ***	0.447 ***	0.903		
Tourists abilities	0.925	0.804	−0.500 ***	−0.553 ***	0.554 ***	0.437 ***	0.424 ***	0.490 ***	0.424 ***	0.476 ***	0.496 ***	0.896	
Risk avoidance behavior	0.845	0.646	0.564 ***	0.574 ***	−0.587 ***	−0.451 ***	−0.470 ***	−0.491 ***	−0.470 ***	−0.492 ***	−0.553 ***	−0.562 ***	0.804

Note: *** $p < 0.001$.**Table 6.** Pearson correlation analysis.

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11
Risk avoidance behavior	3.025	1.077	1										
Perceived severity	3.277	1.326	0.509 **	1									
perceived susceptibility	3.326	1.330	0.515 **	0.513 **	1								
perceived controllability	3.079	1.111	−0.507 **	−0.469 **	−0.429 **	1							
Social affective motivation	3.393	1.085	−0.390 **	−0.407 **	−0.358 **	0.392 **	1						
Escape release motivation	3.395	1.046	−0.393 **	−0.354 **	−0.393 **	0.393 **	0.475 **	1					
Stimulating challenge motivation	3.325	1.065	−0.417 **	−0.367 **	−0.403 **	0.422 **	0.493 **	0.517 **	1				
Achievement satisfaction motivation	3.402	1.035	−0.380 **	−0.381 **	−0.402 **	0.397 **	0.520 **	0.499 **	0.502 **	1			
External propaganda motivation	3.372	1.076	−0.418 **	−0.405 **	−0.393 **	0.422 **	0.504 **	0.510 **	0.534 **	0.491 **	1		
Travel opportunities	3.316	1.354	−0.501 **	−0.450 **	−0.493 **	0.500 **	0.357 **	0.371 **	0.384 **	0.390 **	0.395 **	1	
Tourists abilities	3.349	1.326	−0.508 **	−0.468 **	−0.515 **	0.496 **	0.387 **	0.368 **	0.430 **	0.364 **	0.421 **	0.469 **	1

Note: ** $p < 0.01$.

From the organism's perspective, the mean value of perceived severity was 3.277, indicating that tourists believed that COVID-19 would have serious consequences on their health. The mean value of perceived susceptibility was 3.326, the highest among the organism variables, indicating that tourists thought there would be a high risk of infection despite traveling in the context of regular epidemic prevention and control. The mean value of perceived controllability was 3.079, indicating that tourists considered the epidemic constantly changing and difficult to contain. From the response perspective, tourists' intention to avoid travel was $3.025 > 3$, indicating a higher tendency to avoid behavior in such a context. The correlations among the variables laid the foundation for the following path test of the structural model:

5.5. Correlation Analysis Structural Model Testing

According to Table 7, the model fit indices of CMIN/DF, NFI, IFI, TLI, CFI, GFI, and RMSEA in the model met the criteria (CMIN/DF = 1.477, NFI = 0.962, IFI = 0.988, TLI = 0.986, CFI = 0.987, GFI = 0.987, and RMSEA = 0.024); thus, the model fit was good.

Table 7. Model Fit Indices.

CMIN	df	CMIN/DF	NFI	IFI	TLI	CFI	GFI	RMSEA
697.090	472.000	1.477	0.962	0.988	0.986	0.987	0.951	0.024
Suggested value		<3	>0.8	>0.9	>0.8	>0.9	>0.8	<0.08

Path analysis was conducted using AMOS, and the results of the path coefficients of the structural model are listed in Table 8. In terms of stimuli for traveling, travel motivation had a significant effect on perceived severity ($\beta = -0.359, p < 0.05$), perceived susceptibility ($\beta = -0.309, p < 0.05$), perceived controllability ($\beta = 0.365, p < 0.05$), and avoidance behavior ($\beta = -0.162, p < 0.05$), with H1, H6, H8, and H12 supported. Opportunities to travel had a significant effect on perceived susceptibility ($\beta = -0.222, p < 0.05$), perceived severity ($\beta = -0.187, p < 0.05$), perceived controllability ($\beta = 0.241, p < 0.05$), and avoidance behavior ($\beta = -0.139, p < 0.05$), with H2, H3, H9, and H13 supported. Ability to travel had a significant effect on perceived susceptibility ($\beta = -0.267, p < 0.05$), perceived severity ($\beta = -0.205, p < 0.05$), perceived controllability ($\beta = 0.225, p < 0.05$), and avoidance behavior ($\beta = -0.134, p < 0.05$), supporting H4, H5, H7, and H14. In terms of the organism factors of tourism, perceived controllability ($\beta = -0.174, p < 0.05$), perceived severity ($\beta = 0.16, p < 0.05$), and perceived susceptibility ($\beta = 0.166, p < 0.05$) all had significant effects on tourists' avoidance behavior, with H10, H11, and H15 supported. Among the organism factors, perceived susceptibility had the largest direct effect on avoidance behavior (0.166), followed by perceived severity (0.160), and perceived controllability (-0.174).

Table 8. Results of the Path Test.

Path	The Relation Paths between Variables			Unstandardized Regression Coefficients	Standardized Regression Coefficients	Std. Error	t-Test	p	Results
P1	Perceived severity	←	Tourists motivation	−0.616	−0.359	0.084	−7.318	***	Supported
P2	perceived susceptibility	←	Travel opportunities	−0.215	−0.222	0.037	−5.777	***	Supported
P3	Perceived severity	←	Travel opportunities	−0.181	−0.187	0.038	−4.698	***	Supported
P4	perceived susceptibility	←	Tourists abilities	−0.265	−0.267	0.039	−6.728	***	Supported
P5	Perceived severity	←	Tourists abilities	−0.204	−0.205	0.041	−5.006	***	Supported
P6	perceived susceptibility	←	Tourists motivation	−0.531	−0.309	0.080	−6.657	***	Supported
P7	perceived controllability	←	Tourists abilities	0.174	0.225	0.032	5.421	***	Supported
P8	perceived controllability	←	Tourists motivation	0.488	0.365	0.067	7.321	***	Supported
P9	perceived controllability	←	Travel opportunities	0.182	0.241	0.030	5.968	***	Supported
P10	Risk avoidance behavior	←	perceived controllability	−0.158	−0.174	0.043	−3.677	***	Supported
P11	Risk avoidance behavior	←	Perceived severity	0.114	0.160	0.029	3.978	***	Supported
P12	Risk avoidance behavior	←	Tourists motivation	−0.198	−0.162	0.067	−2.955	0.003	Supported
P13	Risk avoidance behavior	←	Travel opportunities	−0.096	−0.139	0.028	−3.377	***	Supported
P14	Risk avoidance behavior	←	Tourists abilities	−0.095	−0.134	0.030	−3.142	0.002	Supported
P15	Risk avoidance behavior	←	perceived susceptibility	0.118	0.166	0.030	3.951	***	Supported

Note: *** $p < 0.001$.

5.6. Mediating Effect Test

To further investigate the mediating effects of perceived severity, perceived susceptibility, and perceived controllability between stimuli and avoidance behavior in tourism, this study used the bootstrap method for validation by taking 5000 bootstrap samples for 95% confidence interval estimates [79] (Wen and Ye 2014). Table 9 shows the bias-corrected confidence intervals for the indirect effects corresponding to the various paths and test significance. The mediating effects of perceived severity, susceptibility, and controllability between travel motivation and avoidance behavior were significant, reaching 17.37%, 15.27%, and 18.86%, respectively. The total mediating and direct effects were 51.50% and 48.50%, respectively, indicating that the total mediating effects played a dominant role in travel motivation's influence on avoidance behavior, but direct effects should not be overlooked. Perceived severity, susceptibility, and controllability had significant mediating effects between travel opportunities and avoidance behavior, reaching 12.1%, 17.60%, and 15.6%, respectively. The total mediating and direct effects were 43.55% and 56.05%, respectively, indicating that direct effects played a dominant role in the influence of travel opportunities on avoidance behavior, but total mediating effects should not be overlooked. Perceived severity, susceptibility, and controllability had significant mediating effects on the ability to travel and avoidance behavior, reaching 13.20%, 14.92%, and 16.94%, respectively. The total mediating and direct effects were 46.40% and 53.60%, respectively, indicating that direct effects played a dominant role in the influence of the ability to travel on avoidance behavior, but total mediating effects should not be overlooked.

5.7. Multigroup Constancy Test

To test whether the model could be applied to different groups, this study grouped the samples according to whether they had travel experience after the outbreak of the epidemic, and conducted multigroup CFA tests for the group with travel experience after the outbreak of the epidemic and the group with no travel experience after the outbreak of the epidemic to analyze the difference between the restricted and unrestricted models. In the restricted model, the factor loading, factor variance, and regression path coefficients were set equally. The results of the tests are shown in Table 10, where the chi-square difference ($\Delta\chi^2$) between the fully restricted model and the baseline model did not reach a significant level ($\Delta\chi^2(130) = 130.480, p > 0.05$), indicating that the restricted model was acceptable and that the measured model was constant across groups.

Multigroup tests were conducted on the causal paths of the structural equations (Tables 11 and 12), and the baseline model for the group with or without post-epidemic travel experience showed better goodness of fit ($\chi^2/df = 1.308, p < 0.001$, RMSEA = 0.019, GFI = 0.918, NFI = 0.935, TLI = 0.982, CFI = 0.984, and IFI = 0.984). The different parameters of the structural model were restricted separately to form a series of nested models, and the baseline model was compared with the nested models to test the significance of the difference in chi-square between them. The results showed no significant differences between the various paths. In addition, the models of the group with travel experience after the outbreak of the epidemic ($\chi^2/df = 1.322$, GFI = 0.918, NFI = 0.934, IFI = 0.983, TLI = 0.981, CFI = 0.983, RMSEA = 0.028) and that of the group with no travel experience after the outbreak of the epidemic ($\chi^2/df = 1.293$, GFI = 0.918, NFI = 0.937, IFI = 0.985, TLI = 0.983, CFI = 0.985, RMSEA = 0.027) were slightly different in terms of model fit, indicating that the model was stable across groups.

Table 9. Results of the Mediating Effect Testing.

Effect Type	Path Relation	β	LLCI	ULCI	p	Proportion of the Effect
Total effect1	Tourists motivation → Risk avoidance behavior	−0.334	−0.433	−0.234	0.000	
Direct effect1	Tourists motivation → Risk avoidance behavior	−0.162	−0.278	−0.051	0.003	48.50%
Total indirect effect1	Tourists motivation → Risk avoidance behavior	−0.172	−0.245	−0.116	0.000	51.50%
Indirect effect1	Tourists motivation → perceived controllability → avoidance behavior	−0.063	−0.111	−0.025	0.001	18.86%
Indirect effect2	Tourists' motivation → perceived susceptibility → Risk avoidance behavior	−0.051	−0.088	−0.023	0.001	15.27%
Indirect effect3	Tourists' motivation → Perceived severity → Risk avoidance behavior	−0.058	−0.097	−0.026	0.000	17.37%
Total effect2	Tourists' abilities → Risk avoidance behavior	−0.250	−0.343	−0.160	0.000	
Direct effect2	Tourists' abilities → Risk avoidance behavior	−0.134	−0.231	−0.040	0.005	53.60%
Total indirect effect2	Tourists' abilities → Risk avoidance behavior	−0.116	−0.171	−0.073	0.000	46.40%
Indirect effect2	Tourists' abilities → perceived controllability → avoidance behavior	−0.039	−0.077	−0.015	0.001	15.60%
Indirect effect2	Tourists' abilities → perceived susceptibility → Risk avoidance behavior	−0.044	−0.079	−0.020	0.001	17.60%
Indirect effect3	Tourists' abilities → Perceived severity → Risk avoidance behavior	−0.033	−0.062	−0.013	0.000	13.20%
Total effect3	Travel opportunities → Risk avoidance behavior	−0.248	−0.336	−0.155	0.000	
Direct effect3	Travel opportunities → Risk avoidance behavior	−0.139	−0.231	−0.051	0.003	56.05%
Total indirect effect3	Travel opportunities → Risk avoidance behavior	−0.108	−0.161	−0.069	0.000	43.55%
Indirect effect3	Travel opportunities → perceived controllability → avoidance behavior	−0.042	−0.078	−0.017	0.001	16.94%
Indirect effect3	Travel opportunities → perceived susceptibility → Risk avoidance behavior	−0.037	−0.066	−0.016	0.001	14.92%
Indirect effect3	Travel opportunities → Perceived severity → Risk avoidance behavior	−0.030	−0.059	−0.011	0.000	12.10%

Table 10. Constancy Test of the Model.

Group	Model	χ^2	df	RMSEA	IFI	TLI	CFI	$\Delta\chi^2$	Multi-Group Constancy
Travel experience after the outbreak of the pandemic (Yes/No)	Baseline	1111.292	880	0.018	0.987	0.985	0.987	130.480 ($p > 0.05$)	Supported
	Restricted	1241.772	1001	0.017	0.987	0.986	0.987		

Table 11. Model Fit Indices of the Group.

With Travel Experience after the Outbreak of the Epidemic				With No Travel Experience after the Outbreak of the Epidemic			
Suggested Value				Suggested Value			
CMIN	623.947			CMIN	610.345		
df	472.000			df	472.000		
CMIN/DF	1.322	<3		CMIN/DF	1.293	<3	
NFI	0.934	>0.8		NFI	0.937	>0.8	
IFI	0.983	>0.9		IFI	0.985	>0.9	

Table 11. Cont.

With Travel Experience after the Outbreak of the Epidemic				With No Travel Experience after the Outbreak of the Epidemic			
Suggested Value				Suggested Value			
TLI	0.981	>0.8		TLI	0.983	>0.8	
CFI	0.983	>0.9		CFI	0.985	>0.9	
GFI	0.918	>0.8		GFI	0.918	>0.8	
RMSEA	0.028	<0.08		RMSEA	0.027	<0.08	

Table 12. Constancy Test of the Structural Model.

Path		Path Relations		With Travel Experience after the Outbreak of the Epidemic	With No Travel Experience after the Outbreak of the Epidemic	Baseline Model	Restricted Model (Equal Restricted Paths)	Chi-Square Test Results
				Path Coefficient (β)	Path Coefficient (β)			
P1	Risk avoidance behavior	←	Tourists' motivation	−0.167 *	−0.152 *	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.432$	$\chi^2(1) = 0.141, p > 0.05$
P2	Perceived severity	←	Tourists' motivation	−0.379 ***	−0.35 ***	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.565$	$\chi^2(2) = 0.274, p > 0.05$
P3	perceived susceptibility	←	Tourists' motivation	−0.355 ***	−0.264 ***	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1236.039$	$\chi^2(3) = 1.748, p > 0.05$
P4	perceived controllability	←	Tourists' motivation	0.315 ***	0.41 ***	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.475$	$\chi^2(4) = 0.184, p > 0.05$
P5	Risk avoidance behavior	←	Travel opportunities	−0.124 *	−0.157 **	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.46$	$\chi^2(5) = 0.169, p > 0.05$
P6	Perceived severity	←	Travel opportunities	−0.218 ***	−0.143 *	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.788$	$\chi^2(6) = 0.497, p > 0.05$
P7	perceived susceptibility	←	Travel opportunities	−0.173 **	−0.274 ***	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1236.403$	$\chi^2(7) = 2.112, p > 0.05$
P8	perceived controllability	←	Travel opportunities	0.267 ***	0.216 ***	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.602$	$\chi^2(8) = 0.311, p > 0.05$
P9	Risk avoidance behavior	←	Tourists' abilities	−0.127 *	−0.147 *	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.304$	$\chi^2(9) = 0.013, p > 0.05$
P10	Perceived severity	←	Tourists' abilities	−0.168 **	−0.245 ***	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1235.235$	$\chi^2(10) = 0.944, p > 0.05$
P11	perceived susceptibility	←	Tourists' abilities	−0.256 ***	−0.271 ***	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.3$	$\chi^2(11) = 0.009, p > 0.05$
P12	perceived controllability	←	Tourists' abilities	0.249 ***	0.201 ***	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.825$	$\chi^2(12) = 0.534, p > 0.05$
P13	Risk avoidance behavior	←	perceived controllability	−0.166 *	−0.185 **	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.32$	$\chi^2(13) = 0.029, p > 0.05$
P14	Risk avoidance behavior	←	perceived susceptibility	0.180 **	0.147 *	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.517$	$\chi^2(14) = 0.226, p > 0.05$
P15	Risk avoidance behavior	←	Perceived severity	0.138 *	0.183 ***	$\chi^2(414) = 1234.291$	$\chi^2(414) = 1234.406$	$\chi^2(15) = 0.115, p > 0.05$

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

6. Discussions and Implications

6.1. Discussions and Conclusions

This study uses the S-O-R theoretical model as a research framework and integrates MOA and HBM models to construct a theoretical model of tourists' health risk avoidance behavior in China, revealing the relationships between tourists' motivations, opportunities, abilities to travel, health risk perceptions (perceived severity, perceived susceptibility, and perceived controllability), and avoidance behavior after the outbreak of the epidemic. The conclusions of this study are representative and reproducible to a certain extent. Due to different cultural backgrounds and histories, there are differences in the characteristics of people in different countries. Therefore, the conclusions of this study will be more repeatable in countries with similar cultural backgrounds and policy measures towards the epidemic.

In the context of regular epidemic prevention and control, tourists tend to adopt a range of avoidance behavior toward tourism activities. The results of the descriptive statistical analysis showed that the mean value of health risk avoidance behavior among tourists was 3.76. That is, despite the fact that two years have passed since the outbreak of COVID-19, tourists have a high tendency to avoid tourist activities amid regular epidemic prevention and control. The National Health Commission of the People's Republic of China took the lead in establishing a joint prevention and control mechanism in response to the new epidemic, formulating an array of policies, and holding dozens of press conferences. People receive all sorts of information every day in the era of information explosion, which can influence tourists' emotions in some ways and further stimulate them to take their lives and health more seriously and rationally consider whether they can afford the unknown consequences of their travel activities. Thus, it is inevitable for them to undertake health risk avoidance behaviors, such as cancelling travel plans or changing itineraries.

In terms of the stimuli for health risk avoidance behavior, travel motivation has a negative effect on avoidance behavior. The results of the descriptive statistical analysis showed that escape, self-release, and excitement were the most important motivations for tourists to undertake tourism activities in the context of regular epidemic prevention and control. After going through measures such as lockdown and quarantine, coupled with the pressure of a fast-paced life and work, people generally want to travel to relax, temporarily forget their worries, and experience something different from their daily lives. According to the results of the structural equation model, the total effect of travel motivation on avoidance behavior was the largest, suggesting that travel motivation had a negative predictive effect on avoidance behavior, which is consistent with previous studies [60]. In addition, this study found that travel motivation indirectly drives tourists' health risk avoidance behavior by negatively influencing the perceived severity and susceptibility of tourist activities and positively influencing perceived controllability, which verifies the results of previous studies [61,62]. In a nutshell, stronger motivations of tourists to undertake tourist activities reduce their perceptions and assessment of health risks, so they are more willing to take on a degree of health risk to satisfy their intrinsic needs for leisure, relaxation, achievement, etc.

Second, travel opportunities have a negative driving effect on tourists' avoidance behavior. The results of the descriptive statistical analysis showed that the influence of the support provided by the government and relevant departments in terms of policy, channel, and guarantee for tourists on tourists' health risk perceptions outstripped that of travel motivation on tourists' health risk perceptions, among which the guarantee and support for tourism was the most pivotal part. This is contradictory to previous research on the willingness of sports tourism [20], but it can be explained by the fact that the measures of prevention and control across China are precise and effective, with lines of defense established to safeguard people's health and life. For example, the measure of "one precision and three guarantees" of Tonghua, Jilin, the strategy of "three mosts" in Shuo Zhou, Shanxi, and the guidelines of "being careful and unremitting" of Dehong, Yunnan are all forceful measures and policies, which have boosted the courage and confidence of tourists

to overcome the epidemic, enhancing their psychological well-being, sense of security, and satisfaction when traveling [68]. According to the results of the structural equation model, travel opportunities have significant negative effects on tourists' avoidance behavior. Opportunities to travel had the largest direct effect on health risk avoidance behavior among all variables. Favorable policies, adequate channels, and strong safeguards provided by the government and tourism-related departments for tourists' travel and activities result in a safer tourism environment in the country, creating more opportunities and conditions for tourists to travel. Under such circumstances, tourists tend to continue planning their itineraries based on good protection, rather than cancelling their trips.

It has also been found that opportunities to travel indirectly drive tourists' health risk avoidance behavior by negatively influencing the perceived severity and susceptibility of tourist activities and positively influencing perceived controllability. The reasons are twofold. First, national and local governments have formulated a series of policies in terms of epidemic prevention and control to ensure the safety of domestic tourism. Second, 31 provinces and cities in China have formulated policies to support tourism after the pandemic was effectively implemented. On 21 February 2022, the National Development and Reform Commission and 14 other departments issued policies to promote the recovery and development of industries in the service sector. The "10+7+N" policy mix boosted tourists.

Third, tourists' ability to travel has a negatively catalytic effect on their avoidance behavior. Studies have found that information such as pandemic data, knowledge popularization, and key points of prevention and control released by the Chinese government and relevant departments via media outlets such as People's Daily and the Xinhua News Agency facilitate Chinese tourists' abilities to travel. According to the results of the structural equation model, the ability to travel negatively and indirectly drives tourists' health risk avoidance behavior by negatively influencing the perceived severity and susceptibility of tourist activities and positively influencing the perceived controllability, which has been verified in previous studies [71]. Tourists better informed of the virus and more equipped with healthy habits and skills to maintain a healthy condition for traveling are likely to be more willing to travel and less likely to show avoidance behavior, such as cancelling trips or changing plans.

From the perspective of the organism factors of tourists' health risk avoidance behavior, first of all, both perceived susceptibility and perceived severity of health risks are positive predictive factors of avoidance behavior during the pandemic. It has been shown that perceived severity was the factor most feared by tourists, whose positive effect on avoidance behavior was significant. The vast majority of tourists believe that contracting the virus will not only greatly harm their physical health but also cause serious social consequences, such as affecting their work, family life, or social relationships, and even triggering cyber violence, which to some extent reflects tourists' sensitivity to health risks. When they feel seriously threatened, they avoid traveling more drastically. Perceived susceptibility, which positively influences health risk avoidance behavior, follows perceived severity as the second frightening factor for tourists. It is widely believed that traveling increases the likelihood of contracting COVID-19, especially when they are in the same space as an infected person. In other words, higher perceived susceptibility and severity of risk motivate tourists to take action to lower risk [23,80].

Second, perceived controllability prevents tourists from developing health risk avoidance behaviors. There is a consensus among tourists that the virus is widespread, and they are, therefore, particularly concerned about the prevention and control situations in the country. There are two main reasons for this finding. First, the pandemic is characterized by sporadic outbreaks. A resurgence due to a tour group in October 2021 motivated increasingly proactive avoidance behavior. Second, more than ten variants of the virus have been identified to date, such as Delta and Omicron variants, which are spreading more fiercely and widely. All of this will affect tourists' judgment of the controllability of the epidemic in the country. The structural equation model showed that perceived controllability had a significant negative effect on health risk avoidance behavior. If an individual reckons that

domestic health risk control measures are effective, they are more likely to believe in the controllability of the health risk of the epidemic and are more likely to travel [55].

In addition, the multigroup analysis suggested that the positive effect of perceived severity of travel on avoidance behavior was significantly higher among tourists who had no travel experience after the outbreak of the pandemic than among those who had such experience, which can be explained in two ways. On the one hand, people have not traveled for two years since the outbreak because they are drastically scared by the pandemic. On the other hand, the relaxing and pleasant trips of those who traveled after the outbreak tended to lower their perceptions of the severity of the pandemic, thus affecting their health risk avoidance behavior. In addition, the negative effect of travel opportunities on perceived susceptibility was significantly higher for those who had no post-epidemic travel experience than for those who had such experience. People with no travel experience, after being “tested” and “strengthened” by the epidemic for more than two years, tended to be more willing to travel than to avoid it when faced with ample opportunities. It is understandable that those with travel experience were less enthusiastic about travel than those with no travel experience for more than two years.

6.2. Implications and Limitations

Compared to relevant studies in academia in the context of the epidemic, the theoretical contributions of this study are as follows. First, it develops an integrated model that uses S-O-R as a research framework and combines MOA and HBM to examine the mechanisms influencing tourists’ health risk avoidance behavior. Generally, the S-O-R framework is supported and extended by factors from the MOA and HBM, providing a new developmental perspective of S-O-R, MOA, and HBM. Second, it provides interesting insights into health risk perceptions. It provides a theoretical basis for policy formulation and implementation by the government and relevant departments to interpret health risk perceptions from three dimensions: perceived severity, perceived susceptibility, and perceived controllability. Third, it advances research in the field of tourist behavior and expands research in the field of health medicine to a certain extent, constructing a mechanistic pathway between tourists’ perception of health risks and their avoidance behavior in the context of regular epidemic prevention and control. Fourth, the study achieves a universality of findings by focusing not only on tourists who have traveled but also on potential tourists.

The results of this study also have general practical significance to a certain extent. It provides reference for government staff and tourism enterprise managers in the post-epidemic era to create a safer and more comfortable tourism environment for tourists. It has been shown that travel motivation had the greatest impact on tourists’ health risk perceptions and avoidance behavior. Moreover, excessive expansion of motivation tends to weaken avoidance behavior, which is not conducive to epidemic prevention and control. Governments at different levels should reduce travel motivation. Many potential tourists have not traveled during the pandemic. Therefore, it is important for the government to use technical means to develop active travel policies in line with the requirements of prevention and control, such as encouraging staggered travel and issuing coupons for staggered travel, implementing a reservation system for scenic spots to control the flow of traffic while ensuring the normal operation of scenic spots, and developing modes of experience such as virtual tourism to allow people to enjoy beautiful scenery while staying at home.

Given the significant negative effect of opportunities to travel on tourists’ health risk avoidance behavior, which has the largest direct effect, the government and relevant authorities should spare no effort to create a safe, stable, and reliable external travel environment in the country. They should also continue the formulation of reasonable policies and regulations, connect tourist channels, and firmly take measures to lower tourist health risks in order to reduce health risks during trips and increase the satisfaction and happiness of tourist experiences.

In addition, it has also been proven that the ability to travel is negatively correlated with avoidance behavior. Thus, policymakers should strengthen tourists' HL, consolidate their scientific understanding of the pandemic and enhance their capabilities of prevention and control when traveling. For example, governments at all levels and relevant departments should use APPs to call for a local knowledge contest on epidemic prevention and control for all tourists to strengthen their health awareness and use media platforms such as traditional media like TV and radio, as well as new media such as Weibo, Tiktok, the Red, Bilibili, and WeChat, to promote the publicity of knowledge about COVID-19 and improve tourists' prevention and control ability. Tourism-related companies in tourist destinations should set up facilities and deploy service staff in scenic areas to inform visitors how to simply and effectively prevent contracting the virus, monitor mask-wearing, and remind tourists of any health risks in a timely manner. In general, scenic spots should also provide tourist leaflets and brochures for visitors, and demonstrate measures to prevent and control the virus in scenic areas to raise awareness of the need for and importance of taking precautionary measures.

It is worth noting that this study has limitations. First, while the samples are representative of tourists who have traveled since the outbreak and potential tourists who have not traveled since the outbreak, those who have suffered the consequences of the severe outbreak may not have been included. Second, due to the long duration of the pandemic and the intermittent nature of outbreaks, future studies could be conducted at various stages. Third, this study only investigated the antecedent effects of tourists' motivation, opportunity, and ability to travel on health risk perceptions and avoidance behavior based on the MOA model. Future studies can touch upon the effects of information concerns, technology involvement, etc. on health risk perceptions and avoidance behavior and may not be limited to a specific model in the future to examine when not confined to a certain model. Fourth, although this study makes some contributions to the existing knowledge of tourist behavior, future research could extend to factors that may interfere with tourists' decision-making processes. Fifth, this study measured tourists' health risk avoidance behavior using only three measurement variables, and future research could consider a more comprehensive dimensional division and develop an avoidance behavior scale that might be more relevant to real-life situations. Safety is the core of the behavioral intention of tourists to undertake tourist activities, but some, such as young or adventurous tourists, still travel regardless of health risks to satisfy their travel motivations [13]. In conclusion, this study provides a basic theoretical framework for tourists' health risk avoidance behavior in the context of regular epidemic prevention and control. Future studies should expand our understanding of the complex associations behind travel decisions.

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Appendix A

Health Risk Perception and Avoidance Behavior Questionnaire

Dear friends,

Hello! We are We hope to understand your travel intention and avoidance behavior under the background of regular epidemic prevention and control through this questionnaire, so as to provide research support for the formulation of domestic tourism policies and the development of tourism industry.

The questionnaire is collected anonymously, and the results are only for academic research and will not affect your privacy. There is no right or wrong answer. Please tick “√” according to your actual situation.

The questionnaire is expected to take about 5 min of your time. Your careful filling will have a very important impact on our research. Thank you very much for your cooperation and support!

Part 1: Health risk perception

What do you think are the possible consequences of infection of COVID-19 during travel?

Items	Strongly Disagree	Not Quite Agree	Moderately Agree	Agree	Strongly Agree
Infection with COVID-19 can cause serious damage to the body	1	2	3	4	5
Infection with COVID-19 can cause death	1	2	3	4	5
Infection with COVID-19 can cause serious social consequences (affecting work, family life or social relationships)	1	2	3	4	5

Do you think you are more likely to contract COVID-19 while traveling?

Items	Totally Impossible	Not Quite Possible	Moderately Possible	Possible	Very Possible
I have a higher probability of catch COVID-19 infections during my travel	1	2	3	4	5
I am at serious risk of COVID-19 infection	1	2	3	4	5
As long as I'm in the same space as someone who's infected COVID-19, I can catch it	1	2	3	4	5

How do you think China's epidemic control is?

Items	Strongly Disagree	Not Quite Agree	Moderately Agree	Agree	Strongly Agree
I think the epidemic is very widespread	1	2	3	4	5
I think a new outbreak could emerge at any time	1	2	3	4	5
I think the epidemic is difficult to control	1	2	3	4	5

Part 2: Impact of the epidemic

In the context of the regular epidemic prevention and control, the reasons driving you to travel are:

Items	Strongly Disagree	Not Quite Agree	Moderately Agree	Agree	Strongly Agree
To talk to more people	1	2	3	4	5
To increase my bond with friends or family	1	2	3	4	5
To make many new friends	1	2	3	4	5
Bring joy to my post-quarantine life	1	2	3	4	5
Relieve the stress of work or life	1	2	3	4	5
Traveling takes my mind off my troubles for a while	1	2	3	4	5

Items	Strongly Disagree	Not Quite Agree	Moderately Agree	Agree	Strongly Agree
Challenge yourself and be full of the unknown	1	2	3	4	5
Let me get a different travel experience	1	2	3	4	5
Experience something different	1	2	3	4	5
Make your experience more unique	1	2	3	4	5
Share your experience with others	1	2	3	4	5
Allow yourself to feel a sense of accomplishment	1	2	3	4	5
Friends or family recommend	1	2	3	4	5
Weibo, wechat publicity and other advertising attract	1	2	3	4	5
The attraction of the tour experience shared by others on the Internet	1	2	3	4	5

In the context of the regular epidemic prevention and control, the reasons driving you to travel are:

Items	Strongly Disagree	Not Quite Agree	Moderately Agree	Agree	Strongly Agree
Government/related enterprises' policy support for tourism	1	2	3	4	5
Government/related enterprises guarantee support for tourism	1	2	3	4	5
Government/related enterprises' channel support for tourism	1	2	3	4	5

In the context of the regular epidemic prevention and control, the reasons driving you to travel are:

Items	Strongly Disagree	Not Quite Agree	Moderately Agree	Agree	Strongly Agree
I have a clear knowledge of novel Coronavirus	1	2	3	4	5
I have healthy habits and behaviors	1	2	3	4	5
I have the skills to stay in healthy travel mode	1	2	3	4	5

Part 3: Health risk avoidance behavior

In what ways do you try to avoid COVID-19 during travel?

Items	Strongly Disagree	Not Quite Agree	Moderately Agree	Agree	Strongly Agree
Cancel travel plans	1	2	3	4	5
Go ahead with your travel plans, but cover your way	1	2	3	4	5
The plan is flexible for adjustment	1	2	3	4	5

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