



Mediating Role of Risk Perception and Environmental Quality on the Relationship Between Risk Knowledge and Traveler's Intention in COVID-19

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The recent outbreak of epidemic disease (COVID-19) has dramatically changed the socio-economic and environmental dynamics of the world. In particular, it affects human movement, travel intentions, and ambient air pollution amid rising stringency measures. Therefore, this study examines the influence of tourism knowledge, environmental vulnerability, and risk knowledge on travelers' intentions in China's tourism industry during COVID-19. To address the study objectives, an online survey questionnaire was created, through which a valid sample of 402 respondents was achieved. The direct and indirect relationship between variables was tested through structural equation modeling, the outcomes confirm that both tourism knowledge and risk knowledge in terms of COVID-19 significantly and negatively define the travelers' intention toward tourism. Moreover, environmental vulnerability moderately affected tourism behavior and augmented with COVID-19 stringency disclosures. The mediating effect of risk perception and attitude towards the relationship between exogenous and endogenous constructs was tested. It shows a significant mediating impact of risk perception, environmental hazards and attitude towards risk on the nexus between tourism knowledge and travelers' intention. The study offers valuable recommendations for policymakers to understand tourist intentions and climate vulnerability.

Keywords: social consequences, COVID-19, risk perception, tourism industry, climate vulnerability, China

INTRODUCTION

The year 2020 saw the outbreak of a global pandemic of Coronavirus that severely impacted a variety of work sectors. The collapse of expenditures in the outsourcing sector caused detrimental damage to various services such as tourism, transport, retail, entertainment, and catering (Xuefeng et al., 2021; Irfan et al., 2022). According to the World Tourism and Travel Council (WTTC) survey, a considerable loss of nearly \$22 billion will face the global tourism industry due to the spread of COVID-19 (Zhu and Deng, 2020). China faced immediate loss in the tourism sector as the spring

Festival in 2020 was canceled due to the pandemic costing 55 billion Yuan to the economy. As per the reports of the China Tourism Academy, the number of travelers dropped by 15.5% in 2020. The amount generated by the domestic or rural tourism industry also shrank by 20.6% in 2020, causing a considerable reduction in tourism revenue by 1.18 trillion Yuan (Jin and Park, 2019). Survey reports have shown that COVID-19 caused a significant crisis in the tourism sector (Manzoor et al., 2019).

The COVID-19 outbreak first hit China at the start of January 2020, causing most Chinese citizens to go into self-isolation (Irfan et al., 2021a). As per the findings of the Wind database, the favorable ratio of COVID-19 cases in China reduced in late February 2020. Meanwhile, the number of positive COVID-19 cases in foreign countries surpassed that of China in March 2020. The pandemic spread was brought under effective control across China through various isolation measures that also raised many Chinese residents' desire to go escape isolation. At that stage, a rural tourism policy might be the first choice to satisfy the desire of people to come out of isolation. Rural tourism provides several benefits such as short time consumption, low travel cost, low flow density, and the development of rural areas (Rudyanto et al., 2021; Razzaq et al., 2022). Rural tourism could also psychologically fill the requirements of people to enjoy natural beauty in safety while going out for a visit. In addition, people have shifted their concern towards rural tourism, whereas governments have a major focus on controlling the outbreak of COVID-19. Thus, rural tourism can provide a valuable opportunity for the economy to create rapid recovery (Zhu and Deng, 2020).

As stated by Wang et al. (2021), risk perception is the starting point to judge the crisis impact on the tourism sector. The preference and behavior of people become influenced by the perceived risk of pandemic spread in the wake of a public health emergency. Some researchers have proposed that the perceived risk accounted for the behavior of the tourism industry behavior compared to the perceived value (Mitchell and Vassos, 2008). Research in this area is currently exclusively concentrated on the effects of emergencies on the tourist business and general travel intention, ignoring the examination of various types of traveling and people's choices. To begin with, COVID-19 has had a more significant impact than SARS, which first appeared in 2003. Chinese people have attained accurate and mature knowledge of dealing with the spread of the pandemic that can be seen by concrete preventive measures undertaken during COVID-19. Hence, Chinese residents can be taken primarily as the research object for an impact study of the epidemic for better results. In addition, based on the push-pull theory, people have links with traveling from the purpose and needs of travel (Kastenholz et al., 2012; Irfan et al., 2021b; Zhuang et al., 2021). After a long time of isolation, people will take the initiative to get some relaxation from pandemic issues in all sectors. The given research paper mainly focuses on investigating peoples' behavioral intentions. The Chinese government has announced the complete reopening of rural tourist sites. The natural scenery is compelling for relaxation, reducing stress caused by COVID-19, and progressive parent-child relationships through natural tourism. As indicated in the

research, the density of tourist flow through rural tourism is very low compared to internal activities such as science, technology, and museums sites (Han et al., 2019; Razzaq et al., 2020; Sun et al., 2021).

This study aims to determine people's willingness to get involved in rural tourism in the wake of an epidemic and the elements they would consider when making that decision. This paper introduces three new concepts. Due to the features of epidemic situations, the aspect of recognized danger was more persuasive in studying tourism intention than the perceived usefulness and quality. Secondly, the research paper has provided "avoidance behavior theory" for rural tourism to analyze tourist intentions regarding traveling and the internal factors that can impact the tourist intentions. Thirdly, the model of knowledge-attitude-behavior (KAB) was proposed in tourism studies (Mowen and Minor, 1998). For the given research study, research was undertaken based on risk perception. Tourism managers must provide careful considerations to risk perception factors and propose a liable plan for tourism development because it is difficult for consumers to accept the risk factors in tourism (Chhay et al., 2015). Research results have provided a reference for the development of tourism in rural areas during the pandemic of COVID-19.

LITERATURE REVIEW

Tourism Risk Perception

The research work of Bauer Pandy and Rogerson (2019) first proposed the theory of perceived risk and raised the concept of risk in marketing to apply it to consumer behavior. Glowka and Zehrer (2019) provided perceived risk as to the likelihood of negative results in a given task. Based on these research studies, tourism risk perception was termed as individual decisions by tourists that can lead to negative consequences in the tourism sector (McCreary et al., 2018). This negative perception by people can increase as a result of crisis events. Different perceived risks have been determined in people with varying personal characteristics (Cater, 2006). According to the research analysis of Cohen et al. (2014), older people regarding travel experiences such as terrorism, health risks, and natural disasters show less awareness of perceived risks. A wide range of perception ideas was taken from older people (Meng et al., 2021), which pointed to a higher need for guiding and consumer support services for senior citizens. Cui et al. (2016) suggested that women can have a higher perception of food and health risks, while foreign visitors with vast traveling experience may have lower perception than seasonal visitors.

Perceived tourism risks may include satisfaction, time, social, psychological, physiological, capital, and security risks (Zaman et al., 2022). Tourism risk perception provides multi-dimensional aspects of risk. Stone and Grønhaug (1993) verified the existence of six risk dimensions and operational and financial risks. Rudyanto et al. (2021) argued that there are various, various risk perceptions have been determined. These perceptions are crisis risks, operational risks, and cultural-conflict risks. As indicated by Zhu and Deng (2020) covers some other factors

entitled as service risks and equipment risks for tourists. Yang and Xia (2020) focused on operational, physical, cost-related, and psychological risks while dealing with the tourism risk perception. Many other research studies have also analyzed risk perception of time, financial, and equipment risk. Time and financial risks can be combined in the form of cost risk; hence, the seven dimensions have been shifted to six dimensions of risk perception: physical, psychological, performance, cost, social, and equipment risk (Zaman et al., 2022).

Impact of Risk Knowledge on Risk Perception

The uncertainty involved in events initiates risk perception within a particular task (Lepp and Gibson, 2003). The research indicates that foreign tourists who have ample experience of traveling and sufficient knowledge of risk factors in tourism face fewer risks. In the case of a sudden or unknown emergency, the crisis risk perception of tourists will increase significantly. Along with the example of earthquake risk, Wang et al. (2021) provided various negative impacts of earthquake risk perception among tourists and suggested that tourist risk perception of any risk can decrease significantly with increased awareness. Jiang et al. (2022) provided a close relationship between risk perception and knowledge based on multiple linear regression models. Wei (2021) studied the impact of interest development and information acceptance on public perceptions of risk in different sectors, finding that mastery of risk-related knowledge has a detrimental impact on public perceptions. They confirmed the “knowledge weakening hypothesis of public risk perception” and found that risk knowledge negatively impacted risk perception using typology methods. A study by the WHO (2021) provided the factors impacting tourists’ risk perception regarding food additives and revealed that consumer awareness of food additives entails a significant negative impact on risk perception. An emergency for public health was declared during the outbreak of the Coronavirus pandemic. Risk knowledge of Pneumonia and tourism risk knowledge have been taken as dependent variables to determine the impact of the COVID-19 pandemic on people’s behavioral intentions regarding rural tourism. The following hypotheses have been generated in the given research report based on the negative relationship between variables:

H1: There is a significant impact of tourism knowledge on the recommended intention.

H2: There is a significant impact of tourism knowledge on travelers’ intentions.

H3: Knowledge about Pneumonia is significantly linked with recommended intention.

H4: Knowledge about Pneumonia is significantly linked with travelers’ intentions.

H5: There is a significant impact of tourism knowledge on risk perception.

H6: There is a significant impact of knowledge about pneumonia/COVID-19 on risk perception.

Risk Knowledge Impact on Risk Aversion Attitude

Various studies have been conducted to determine the influence of scientific knowledge, universality, tactic knowledge, and shared knowledge on acceptance or risk perception (Acheampong et al., 2021). Knowledge was distributed into three factors—social information, major-oriented knowledge, and general knowledge (Browning et al., 2021). For most people, knowledge of risk comes from general and social information. There has been a positive interconnection between aversion attitude and knowledge, similarly to the concept that medical information can eliminate the discrepancy caused by some diseases (WHO, 2021). However, a negative connection is found between risk aversion and risk knowledge in fields other than the medical. In terms of the popularization of nuclear power, the higher the subjective knowledge someone possesses, the more acceptance they have of the hazards of this power source and the less willing they are to avoid them (Levi and Holder, 1998). Knowledge of financial aspects was linked positively with risk choice attitude in financial scenarios, while the attitude of risk preference was positively correlated with finance market engagement. A significant mediating variable was risk preference attitude. The research study found that social interaction between people will enhance the ability of risk knowledge to take risks.

The difference in risk acceptance was caused due to different cost structures and benefits of behavior. In the medical and health sectors, disease risk is directly linked to an individual’s health; hence the cost proportion of the risk becomes higher than the positive outcome. While in the case of outbound tourism and professional investment, the cost of travel/investment risk is less, and benefits are more. This concept states that getting a master of risk knowledge can enhance the acceptance of risks. People are found to be acting rationally when they are affected by risks and try to avoid the risk entirely or partially (Mäser and Weiermair, 1998). To reduce the expected losses, more consumers prefer a partial avoidance based on risk knowledge while entertaining the benefits developed by the behavior as provided in the research of formulation of a response plan, advance confirmation of risk information, and prompt selection of travel time based on risk attributes (Tsaour et al., 1997). Rural tourism has been termed an incomplete risk avoidance in correlation with travel in the research paper.

People will display a responsive attitude toward tourist risk and eliminate the risk avoidance tendency after obtaining more risk information, according to the hypothesis produced in the given paper based on the qualities of risk attitude and risk knowledge towards rural tourism. To match the risk perception in this study work, the attitude of risk aversion was used as a mediating variable. Based on this risk perception, the following hypotheses were proposed:

H7: Tourism knowledge is significantly linked with the attitude towards risk.

H8: Risk of Pneumonia/COVID-19 is significantly linked with the attitude towards risk.

Risk Perception Impacts on Behavioral Intention

Tourists' perceptions of risk may have a significant impact on their decisions. Risk perception in a particular dimension can increase the total degree of tourism risk perception (Roehl and Fesenmaier, 1992). A reduced likelihood of potential visitors can lead to a higher likelihood of tourists limiting risks through risk aversion. The majority of research found was on the impact of quality service on tourism. Tourist intention was positively connected with transportation convenience, safety, tourism information, accommodation convenience, travel providers, rest time, and conforming psychology. The factors mentioned earlier can be converted into a positive relationship with risk perception factors and tourism intentions. (Sönmez and Graefe, 1998) proved in research that geographical damage, safety concerns, damage to equipment, ethical conflicts, psychological taboo, tourism intention, and cost concerns contained a direct negative correlation. Another research paper provided by Sun and Razzaq (2022) determined the negative impacts of political risk, social risk, and cultural risk on the tourism sector of Japan. They analyzed the factors affecting the willingness to utilize balance values. According to the study, consumers will be positively influenced by perceived utility, perceived simplicity of use, subjective norms, benefits, and behavioral control. Economic risk, security risk, and time risk, on the other hand, posed a negative impact on customer willingness. This study investigated the effects of COVID-19 on tourist behavior intention. The following hypothesis is proposed:

H9: Tourism risk perception is significantly linked with the travelers' intentions.

H10: Tourism risk perception is significantly linked with the recommended intentions.

H11: There is a significant relationship between attitude towards risk and recommended intentions.

H12: There is a significant relationship between attitude towards risk and travelers' intention.

H13: There is a significant mediating effect of risk perception on the relationship between tourism knowledge and travelers' intentions.

H14: There is a significant mediating effect of risk perception on the relationship between knowledge about phenomena and recommended intentions.

Risk Knowledge, Risk Aversion Attitude, and Behavioral Intention Model

Risk attitude can be stated as a consumer's compatible choice towards facing the various risk levels or acceptance of consumers to accept risk. This is termed an intrinsic risk selection characteristic (Weber et al., 2002). Individuals' risk attitudes are influenced by their expected outcomes and perceived dangers, with perceived risks negatively linked with risk attitudes. Pennings et al. (2002) identified disparities in risk acceptance among people when accounted for unique consumer behavior. Hence, it is determined that perceived risks alone cannot back the results of the given research study.

Furthermore, an increase in risk perseverance can affect their buying behavior in the case of risk-averse consumers. Therefore, risk attitude and risk perception can affect the behavioral perception simultaneously.

Risk-averse and risk-neutral people were found to be choosing their vaccination to avoid the risk presented by the pandemic, compared to risk seekers. The research study of Schroeder et al. (2007) showed that decision-making perception is directly affected by the difference in individual risk attitudes. It states that risk avoiders focus on bad outcomes, while risk seekers focus on good outcomes. Finance information was seen to affect the stock market and retail market positively. At the same time, the consumers with a perception of risk own less market stock as compared to those people who deal with risk aversion and attain higher shares in the market. In the case of rural tourism, avoiders of risk pay more heed to the results of a rural tour, while the risk avoiders will have less desire for the tour. In the case of rural tourism, risk avoidance pays more heed to the results of a rural tour.

This paper established the structure of "risk knowledge-risk perception-behavioral intention" and compared it to the "Knowledge-attitude-behavior" (KAB). This model divides the variations in consumers' behavioral intentions into three processes: developing belief, attaining knowledge, and forming behavior (Maser and Weiermair, 2008). The KAB model primarily works to explore the correlation between attitude, knowledge, and behavior, unlike the other models provided for consumer behavior. Based on other theoretical consumer behavior models given in the literature as the planning behavior model states that knowledge is taken as an outer variable that can influence a consumer's attitude. In the case of consumer behavior, control of subjective norms, attitudes, and perceived behavior can be taken as influencing factors. Knowledge perceptions are not the central focus of this research study. The given research study includes the impacts of risk knowledge on the consumer's behavioral intention through the KAB model.

KAB has found its applications in a wide range of education, public health, and clinical medicine. Based on the model of attitude-related behaviors of Chinese universities' sexual knowledge, Saurabh and Nandan (2019) provided that a neutral attitude puts partial impact on sexual-related behaviors based on adequate knowledge of sexual health. Baron and Herzog, (2020) approved the impact of attitude, actions, and knowledge by applying the structural equation model and termed it as an indirect outcome of knowledge on an individual's thinking in the case of hypertension. Hence, it can be determined that a consumer's attitude can be a mediating variable in the correlation between behavior and knowledge. Therefore, this paper proposed the following hypothesis based on rural tourism and KAB theory characteristics.

H15: There is a significant mediating effect of attitude towards risk on the relationship between tourism knowledge and travelers' intentions.

H16: There is a significant mediating effect of attitude towards risk on the relationship between knowledge about phenomena and recommended intentions.

Many risk perception factors affect the consumer's behavior intention, although there are varying influencing aspects for different tourism scenarios. In the case of overseas and domestic tourism, such influencing factors of perceived risk are natural disasters, political situation, public health, and safety. (Huang and Min, 2002). analyzed the impacts of political risk in overseas tourism. The research study of (Academia 2021) concluded that cultural conflict affects tourists' foreign travel choices. Individual attributes of consumers are also the main factor of differences in consumer behavior. They also investigated the variations in perceived risk under different genders and cultural aspects. The given paper mainly implies rural tourism areas that are close to the residing places of the research interviewees. Hence, cultural conflict and political risk factors are not included in the study. To determine the personal information of tourists, descriptive statistical analysis was implemented.

Government-oriented policies and media aspects are considered sources of risk knowledge that will impact consumer behavior. As stated earlier, the example of Taiwan has been taken as the study of earthquake risk and tourism damage; the survey suggested that media reports were established on the tourism damage that potentially affected the tourism on Taiwan Island (Larsen et al., 2009). Media coverage of a natural disaster can reduce the number of visitors and potential visitors, further complicating the post-disaster recovery of some industries such as tourism (Tasci and Gartner, 2016). Under the direction of the Chinese government, state media reports have taken a significant role in the distribution of information. Residents of China have gained correct and practical knowledge about the associated risks during the time of their isolation. This was possible through participating in and implementing the policies on control and prevention of COVID-19. Hence, media reports were not included in the proposed model as an independent variable for the given study.

RESEARCH METHODS

Questionnaire Design

The questionnaire design under the present research is based on the items from existing literature. For example, the term risk perception was measured through five things under the shadow of risk performance. The sample items include "At rural tourism spots, food and entertainment arrangements are not as expected," "The appreciation of natural scenery and landscape are unsatisfactory," and "Travel photography is not good at rural tourist sites," as extracted from the research contribution of (Zhang and Yu, 2017). Furthermore, the term attitude towards risk is measured through three items observed from the researcher's contribution (Liu et al., 2019; Zhang and Yu, 2017). Both the attitude towards risk and risk perception were treated as critical mediators while exploring the relationship between exogenous and endogenous constructs of the study. The sample items for attitude towards risk include "I cannot accept going to travel to the countryside with family and friends" and "I cannot accept that local friends and relatives travel to the

TABLE 1 | Demographic factors.

Gender	Frequency	%	Cumulative %
Man	194	48.3	48.3
Woman	208	51.7	100.0
Total	402	100.0	
Marital Status			
Married	326	81.1	81.1
Unmarried	76	18.9	100.0
Total	402	100.0	---
Age			
15–20 Years	101	25.1	25.1
20–23 Years	188	46.8	71.9
23–27 Years	45	11.2	83.1
above 27 Years	68	16.9	100.0
Total	402	100.0	---
Education			
12 Years	3	0.7	0.7
14 Years	142	35.3	36.1
16 Years or Above	257	63.9	100.0
Total	402	100.0	----

countryside". Moreover, the term tourism the intention was measured through two factors entitled as intention of the tourists and recommendations. The questionnaire items for tourism intention and recommendations were extracted from the research contribution of (Lai and Chen, (2011); Zhao et al., (2016), and Xu et al., (2019), respectively. Both of these factors are treated as primary endogenous constructs under the present study. Finally, the terms tourism knowledge and risk knowledge were treated as the main explanatory variables for which related items were taken from the research work (Feng, 2008; Liu, 2019; Wang et al., 2019; Xu et al., 2019).

After extracting the relevant items for the literature, a questionnaire survey was finalized on the measurement scale of strongly disagree = 1, to strongly agree = 5. The structure of the final questionnaire was covered in three sections. The first section covers the study topic, key objective, and list of the study variables with a shorter definition to understand the respondents better. The second section of the questionnaire covers the selected demographic factors entitled gender, age category, level of education, and current occupation. The third section covers the study items for the explanatory, outcome, and key mediators as measured on the stated scales.

Data Collection

During the outbreak of COVID-19, it is impossible to collect the data through face-to-face interaction; therefore, our study mainly considers the online survey approach. In this regard, both accidental and snowball sampling strategies were used to collect the data from different respondents. More specifically, a respondent-driven sampling approach was applied, which helps reduce the sampling biases and requires respondents to recommend some specific number of peer groups as expressed by Jin and Liu (2016). The questionnaire structure in the online survey covers proper checkboxes and options with simple and easy-to-understand items. The whole data collection process took 5 weeks, from January 15 to 21 February 2022. A total valid response of 402 questionnaires was achieved.

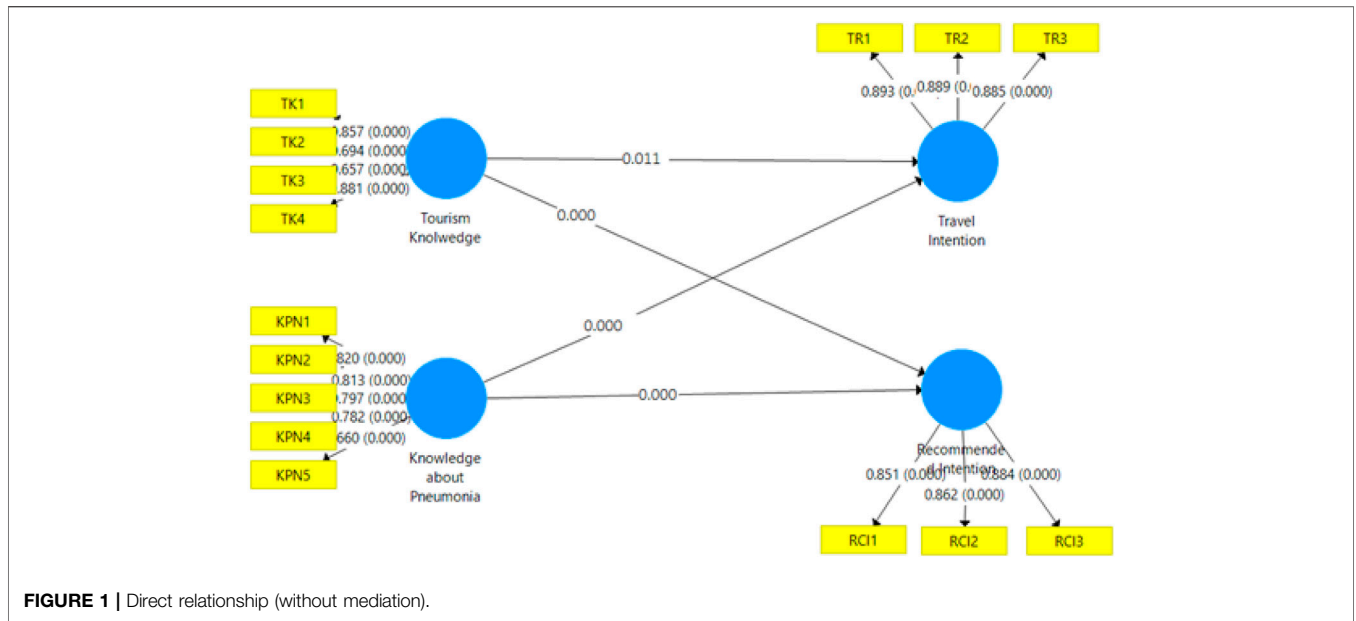


TABLE 2 | Construct reliability and validity.

Variables	CB.	rho_A	CR.	(AVE)
AT: Attitude towards risk	0.926	0.926	0.953	0.871
TK: Tourism Knowledge	0.799	0.810	0.883	0.718
RI: Recommended Intention	0.879	0.899	0.918	0.739
RP: Risk Perception	0.833	0.850	0.899	0.748
KP: Knowledge about Pneumonia	0.850	0.873	0.899	0.692
TI: Travel Intention	0.868	0.869	0.919	0.791

RESULTS AND DISCUSSION

Demographic Details

Among the targeted respondents, there were 194 men (48.3%), and 208 (51.7%) women, showing that women are dominant in the online questionnaire survey. For the marital status, 81.1% (326) were married, whereas the rest of the respondents were unmarried. For the age distribution, the sample covers all the age groups ranging from 15 to above 27 years where 25.1% of the respondents aged 15.20 years, 46.8% of respondents aged 20–23 years, 11.2% were in the age group of 23–27 years, and finally, 68 or 16.9% were in the age of above 27 years as shown in **Table 1**. Finally, the educational demographics reflect that only 0.7% of respondents were 12 years of education, whereas 35.3 and 63.39% have their 14 and 16 years or above educational level. A better detail of the stated demographic factors has been presented in **Figure 1** below through pie charts and relative % scores.

Measurement Model Assessment

For assessing the outer mode/measurement model, Smart PLS 3.0 software was applied. More specifically, under measurement model assessment, investigation for the individual item reliability, internal item consistency, convergent validity, and discriminant validity was considered. **Table 2** reports the

reliability and validity for all latent constructs, where Cronbach’s alpha for all the variables is above 0.70. In contrast, composite reliability (CR) also indicates the reliability of the latent constructs through its relative score for the latent constructs above 0.70. Furthermore, the relative scores in terms of average variance extract for the latent constructs are also reported in **Table 2**. AVE measures the amount of variance captured by a construct with the amount of variance due to measurement error. The threshold level of AVE is 0.50, as expressed by Hair et al. (2010). Therefore, it is inferred that all the latent constructs show acceptable reliability.

Discriminant Validity

The existing literature provides three major approaches for examining discriminant validity: Fornell-Larcker Criterion, loadings and cross-loadings, and Heterotrait-Monotrait Ratio (HTMT). The discriminant validity of the latent constructed Through Fornell-Larcker Criterion is presented in **Table 3**. It shows that the square root of AVE of the stated reflective constructs named attitude towards risk, tourism knowledge, recommended intention, risk perception, ability about Pneumonia, and travel intention is higher than its correlation with another construct. This claims the presence of discriminant validity among the latent constructs.

The reporting for the variance inflation factor for the selected items of the explanatory, outcome, and mediating variables have been presented in **Table 4**. It shows that all the items of these variables have reported a VIF score of below five, which is justified as the threshold in the current literature (Marcoulides and Raykov, 2019; O’Brien, 2007). Therefore, the study variables have no issue in terms of multicollinearity.

Structural Equation Modelling Output

Finally, the findings through the SEM approach in Smart PLS 3.0 are provided in **Table 5**. It shows that tourism knowledge is

TABLE 3 | Fornell-larcker criterion.

Variables	AT	KP	RI	RP	RK	TI
AT: Attitude towards risk	0.893					
TK: Tourism Knowledge	0.362	0.780				
RI: Recommended Intention	0.420	0.195	0.865			
RP: Risk Perception	0.438	0.263	0.403	0.794		
KP: Knowledge about Pneumonia	0.286	0.752	0.131	0.133	0.793	
TI: Travel Intention	0.477	0.215	0.776	0.475	0.149	0.889

AT, attitude towards risk; TK, tourism knowledge; RI, recommended intention; RP, risk perception; KP, knowledge about pneumonia; TI, travel intention.

TABLE 4 | Variance inflation factor.

Items	VIF	Items	VIF
1. AT1	3.956	RP2	2.624
2. AT2	3.185	RP3	1.635
3. AT3	3.760	RP4	2.520
4. KPN1	4.062	RP5	1.726
5. KPN2	3.902	TK1	2.733
6. KPN3	2.389	TK3	1.336
7. KPN4	1.482	TK4	3.033
8. RCI1	1.797	TR1	2.449
9. RCI2	1.944	TR2	2.150
10. RCI3	2.101	TR3	2.257

AT, attitude towards risk; TK, tourism knowledge; RCI, recommended intention; RP, risk perception; KP, knowledge about pneumonia; TI, Travel Intention.

TABLE 5 | Direct relationship between the variables.

Directions	Original sample (O)	SD	T-VALUE	Remarks
TK -> RI	-0.175	0.029	6.098***	Supported H1
TK -> TI	-0.205	0.080	2.563**	Supported H2
KPN -> RI	-0.440	0.091	4.835***	Supported H3
KPN -> TI	-0.263	0.077	3.416***	Supported H4

negatively and significantly linked with both endogenous constructs (i.e., recommended intention and travel intention). It shows that more the greater knowledge a traveler has about tourism, the more it lowers their tourism intention. This is because the current study has considered the tourism knowledge in terms of risk dynamics for which respondents are deeply considered while traveling to China. On the other side, the Knowledge of Pneumonia/COVID-19 is another significant indicator that determines the lower tourism intention and recommends intention among the tourists while coming to China. It confirms that higher the knowledge about Pneumonia/COVID-19 is negatively and significantly impacts traveler preference (beta = -0.440, -0.263, *p*-value = 0.000). The above findings clear that H1-H4 are empirically tested and accepted under current research. The structural output for the direct relationship between these variables has been depicted in **Figure 1**. The inner model shows the *p*-values and the outer model reflects the loadings and the relative *p*-scores, respectively.

After analyzing the direct relationship of the variables without adding both of the mediators, it is confirmed that all the direct paths between independent and dependent

variables are significant at 5%. The mediation approach is entitled Baron and Kenny’s mediation analysis, where an immediate and significant relationship between exogenous and endogenous constructs is initially required (Hayes, 2009; Zhao et al., 2010). More specifically, there is a need to confirm a significant association between the mediator and dependent variable under this approach. Finally, the researcher must examine the direct effect after controlling for the key mediators in the model. If the addition of a mediator in the model rejects the direct association, the stated findings will be entitled to full mediation; otherwise, it is known as partial or absent (Hadi et al., 2016).

- **Table 6** reports the findings after adding the mediating variables (risk perception and attitude towards risk) into the model. The results show that after adding the mediating variables, the association between KP-RI, KP-TI, TK-RI, and TK-TI is statistically insignificant. However, the findings in **Table 6** report the following major output.
- The path coefficient for the association between AT -> RI (M2toDV2) is positively significant at 1%, with a coefficient of 0.301 based on the original sample.
- The path coefficient for the relationship AT -> TI (M2toDV1) is significant, showing that attitude towards is directly associated with the travelers’ intentions in China.
- There is a significant and positive relationship between KP -> AT (IV2toM2), which justifies that more knowledge about COVID-19 is directly linked with the attitude towards risk.
- The path analysis for the direct relationship between risk perception and recommended intention is significant at 1% (beta = 0.274, *t*-value = 4.72).
- **Table 6** also reports a significant relationship between risk perception and travelers’ intention, tourism knowledge and risk perception, knowledge about Pneumonia/COVID-19 and risk perception, and tourism knowledge and attitude towards risk.

Based on the above findings, it is inferred that the direct path between mediators and dependent variables is also statistically significant while creating some insignificant findings for the association between independent and dependent variables. Therefore, such findings will be regarded as mediation on the relationship between tourism knowledge, Knowledge about Pneumonia, travelers’ intention,

TABLE 6 | Mediation effect.

Directions	Original sample (O)	Sample mean (M)	STD	T-value	Remarks
TK -> RP(IV1toM1)	0.285	0.286	0.056	5.09	Sig, H5
KP -> RP(IV2toM1)	0.165	0.161	0.083	1.99	Sig, H6
TK > AT (IV1toM2)	0.365	0.358	0.078	4.68	Sig, H7
KP -> AT (IV2toM2)	0.246	0.247	-0.099	2.48	Sig, H8
RP -> TI (M1toDV1)	0.198	0.007	0.074	2.68	Sig, H9
RP -> RI (M1toDV2)	0.274	0.279	0.058	4.72	Sig, H10
AT -> RI (M2toDV2)	0.301	0.303	-0.058	5.19	Sig, H11
AT -> TI (M2toDV1)	0.337	0.339	0.059	5.71	Sig, H12
KP -> RI(IV2toDV2)	-0.006	-0.009	-0.083	0.07	NS
KP -> TI(IV2toDV1)	-0.018	-0.013	0.071	0.25	NS
TK -> RI(IV1toDV2)	-0.004	-0.002	0.061	0.07	NS
TK -> TI(IV1toDV1)	-0.341	0.34	0.285	1.2	NS

TK, tourism knowledge; KP, knowledge about Pneumonia; RP, risk perception; AT, attitude towards risk; RI, recommended intention; TI, travelers' intention; IV, independent variable; M1, mediating variable; DV, means dependent variable; NS, not significant; Sig, significant.

TABLE 7 | Examining VAF.

Effects	Path	Path Coefficient	Indirect Effect	Standard Deviation	Total Effect	VAF %	T Values	p Value	Decision
Direct without mediator	TK > TI(IV1>DV1)	-0.205		Not applicable			2.563	**	Accepted
Indirect with mediator	TK -> TI(IV1toDV1)	0.341	Not applicable		0.824	58.61	3.71	***	Sig, H13
	TK -> RP(IV1toM1)	0.285	0.483	0.13					
	RP -> TI (M1toDV1)	0.198							
Direct without mediator	KP -> RI(IV2>DV1)	-0.440		Not applicable			4.83	***	Accepted
Indirect with mediator	KP -> TI(IV2toDV1)	0.018	Not applicable		0.381	95.27	2.59	**	Sig, H14
	KP -> RP(IV2toM1)	0.165	0.363	0.14					
	RP -> TI (M1toDV2)	0.198							

Effects	Path	Path coefficient	Indirect effect	Standard deviation	Total effect	Decision	T values	p value	Decision
Direct without mediator	TK -> RI(IV1toDV2)	-0.175		Not applicable			6.09	***	Accepted
Indirect with mediator	TK -> RI(IV1toDV2)	0.004	Not applicable		0.67	99.40	4.89	***	Sig, H15
	TK > AT (IV1toM2)	0.365	0.666	0.136					
	AT -> RI (M2toDV2)	0.301							
Direct without mediator	KP -> RI(IV2toDV1)	-0.44		Not applicable			3.41	***	Accepted
Indirect with mediator	KP- > RI (IV2toDV2)	0.006	Not applicable		0.704	77.698	3.48	***	Sig, H16
	KP- > AT (IV2toM2)	0.246	0.547	0.157					
	AT -> RI (M2toDV2)	0.301							

and recommended intention, respectively. However, to justify the mediating effect as determined by risk perception and attitude towards, indirect effect, total effect, VAF, and relative T-values have been calculated through MS-Excel for this finding, **Table 7**.

As stated earlier, the direct paths between independent and dependent variables were significant; therefore, the inclusion of mediating variables was quite meaningful. For this purpose, an indirect path should be considered to verify the mediating effect of risk perception and attitude. Finally, our findings in **Table 7** provide the outlook regarding the strength of the mediating product through variance accounted for (VAF) as suggested by (Hair et al., 2014). The findings in **Table 7** report

that 58.61% of the effect of TK in the TI is explained through risk perception. As this value is between 20%–60%; therefore, it is inferred as a partial mediation. At the same time, 95.27% of the effect of KP in the TI is explained through risk perception. It shows that the value of VAF is above 80%; therefore, it is regarded as full mediation.

Furthermore, the findings in **Table 7** also report the mediating effect of attitude towards risk on the relationship between exogenous and endogenous constructs. A score of 99.40% variation also covers the full mediation between KP-RI through AT. Finally, VAF for the mediating effect of AT between KP and RI is 77.69%, which reflects partial mediation.

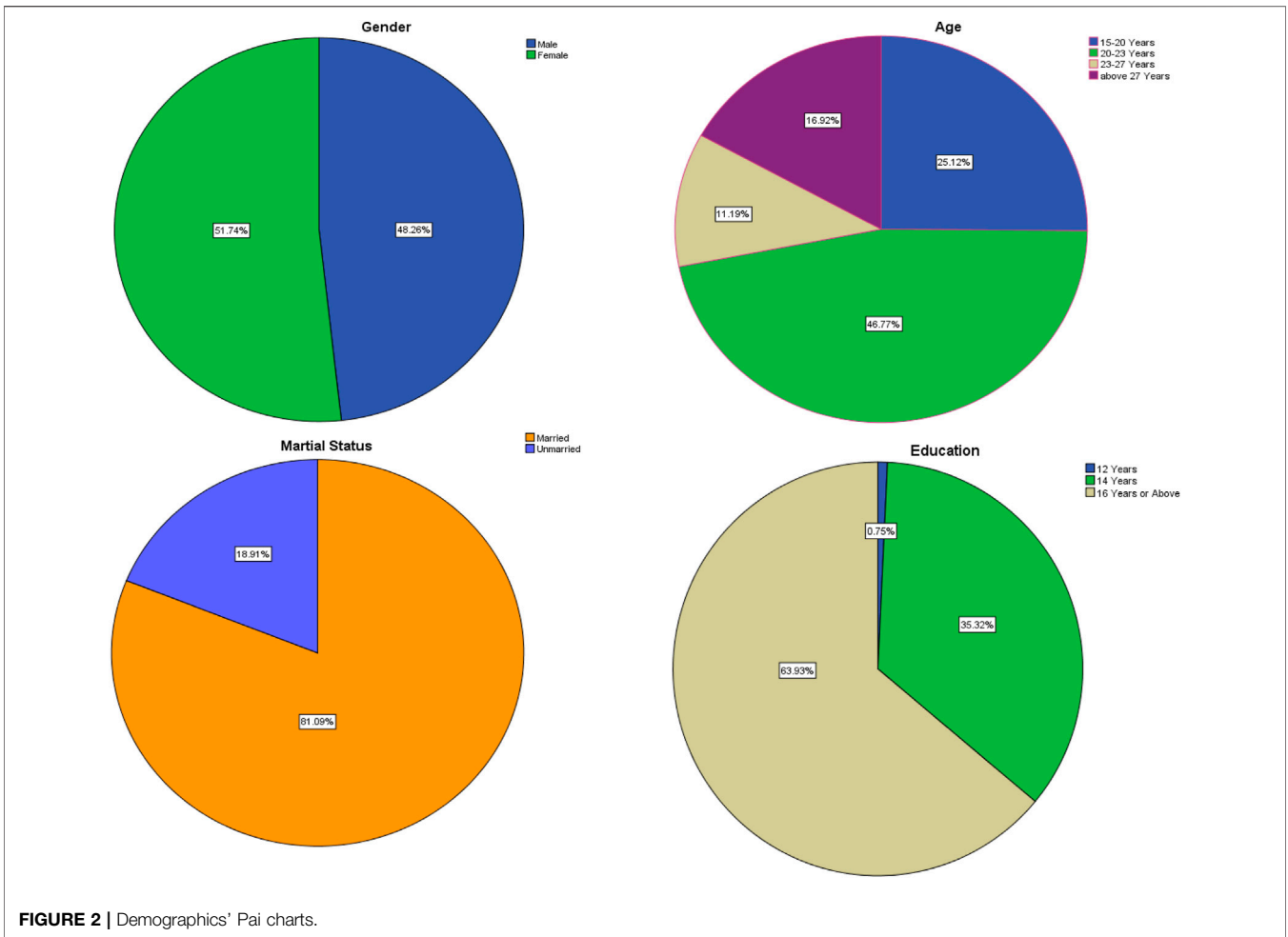


FIGURE 2 | Demographics' Pie charts.

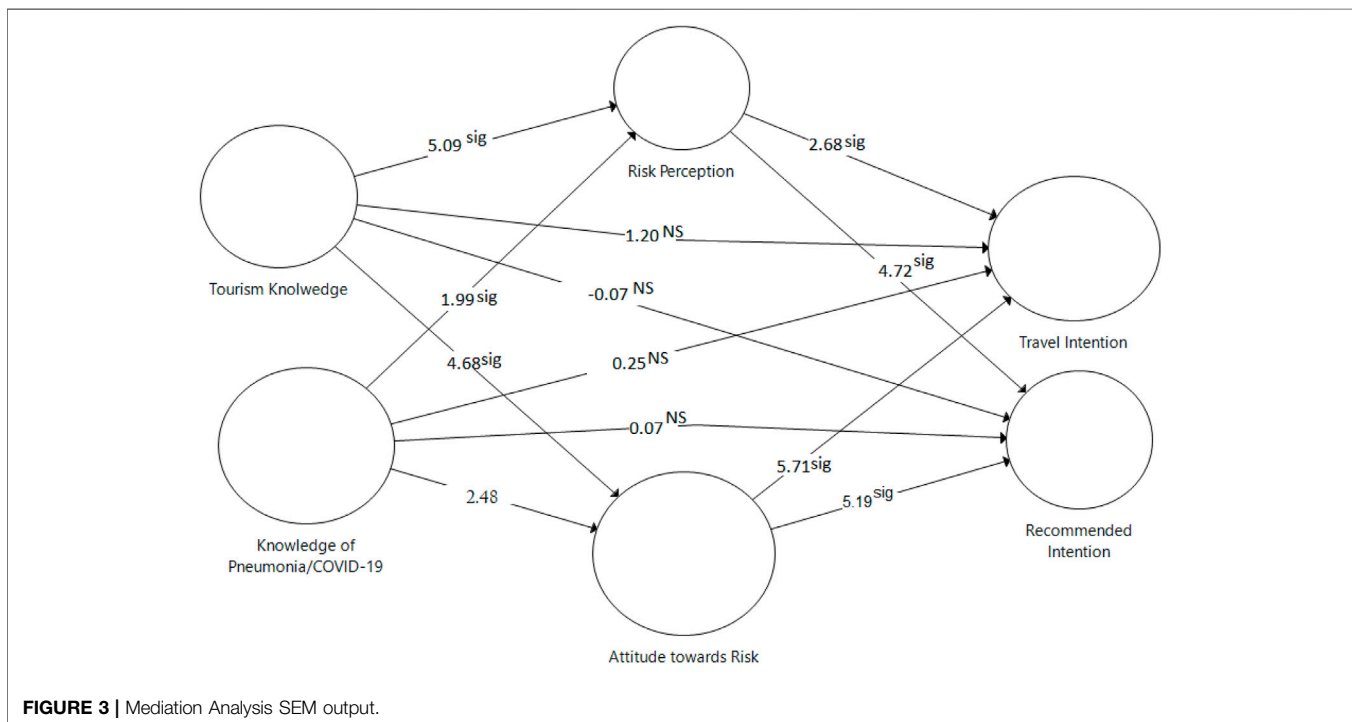


FIGURE 3 | Mediation Analysis SEM output.

CONCLUSION AND RECOMMENDATION

During the recent outbreak of COVID-19, a dramatic change has been observed in the global tourism industry. This study provides a double mediation analysis for investigating the role of risk perception and attitude towards risk in determining the relationship between tourism knowledge, knowledge about Pneumonia/COVID-19 towards travel intention, and recommended intention of the tourists in the Chinese economy. Through a valid sample response of 402 with the help of an online survey questionnaire, data were empirically tested through measurement and structural models. Several direct and indirect hypotheses have been developed and tested. The findings show that without considering risk perception and attitude towards risk, a significant and negative impact of risk knowledge and tourism knowledge on travelers' intention and recommended intention was observed. This would reflect that tourists' choice is adversely affected by the tourism knowledge and risk knowledge factors. However, risk perception and attitude towards risk have provided some interesting results. It is observed that the mediating effect of risk perception between tourism knowledge and travel intention is positively significant with the explanatory power of 58.16, demonstrating a partial mediation. However, 95.27% of the effect of KP in the TI is explained through risk perception, hence regarded as full mediation.

Furthermore, the study findings also report the mediating effect of attitude towards risk on the relationship between exogenous and endogenous constructs. A score of 99.40% variation also covers the full mediation between KP-RI through AT. Finally, VAF for the mediating effect of AT between KP and RI is 77.69%, which reflects partial mediation. This provides one of the major contributions in the literature while filling the direct and indirect relationship between tourism knowledge, risk knowledge, and tourism intention in the region of China.

Finally, it is expressed that current research has several limitations through which future directions would be possible. Firstly, this study takes the residents of China as the sample, while information was collected through an online survey only. This reflects the limited generalizability of the data collection and study findings, specifically in the

Chinese economy. Secondly, although the role of risk perception and attitude towards risk is among the major contributions, however, this study is missing the moderating effect of risk communication for which both theoretical and empirical evidence is available. Thirdly, the only quantitative research design was applied in this research, where future studies are highly recommended to use mixed methods to achieve some out-of-the-box findings (Figure 2, Figure 3) (Roehl and Fesenmaier, 1992).

DATA AVAILABILITY STATEMENT

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

AUTHOR CONTRIBUTIONS

DY presented the idea and design for the research. KZ analyzed the model and drafted the manuscript. NF, ER-A, YA, and MA revised and edited the manuscript.

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