Impacts of Risk Perception, Disaster Knowledge, and Emotional Attachment on Tourists' Behavioral Intentions in Qinling Mountain, China

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With natural disasters occurring more frequently around the world, their impact on tourism is becoming a serious problem. The existing literature in the field of tourism disaster management focuses mostly on disaster impact analysis, risk assessment, and post-disaster recovery, while the impact of disaster on tourism and tourists is still a new topic. It is necessary to investigate the correlation between the natural disasters and the tourists' behavior. Taking the famous tourism destination, Qinling Mountain, located in the middle of China, as an example where frequent mountain disasters happened, we investigated 542 youth group tourists using a questionnaire survey and analyzed the influence of risk perception, disaster knowledge, and emotional attachment on tourists' travel behavioral intentions. The results showed that 1) risk perception has a negative effect on tourists' behavioral intentions; 2) disaster knowledge and tourism emotional attachment have a positive effect on tourists' behavioral intention; and 3) the moderation role of gender is not significant, while the moderation role of education level is significant. Therefore, this analysis is of great importance for research dealing with the theory of tourism disaster and the management practice of disaster-prone tourism destinations.

Keywords: risk perception, disaster tourism, emotional attachment, behavioral intention (BI), tourist

1 INTRODUCTION

Tourism, as a key leisure activity for public, is heavily dependent on natural environment. However, tourism destinations are threatened by natural disasters (Murphy and Bayley, 1989). The frequent occurrence of global natural disasters has affected safety and travel behaviors of tourists. For instance, Mount St. Helens in the United States erupted in 1980 and killed 57 people. In 2004, the tsunami and earthquake in Indonesia killed 292,000 people. In 2008, the Wenchuan earthquake in China caused damage to at least 111 A-level scenic spots; 456 natural ecological landscapes were destroyed, and many tourists were trapped. All these natural disasters pushed global researchers to focus on them.

However, tourists' pursuit of exciting and beautiful scenery even with a high risk of natural disasters continues to promote areas, becoming hot popular tourism destinations (Murphy and Bayley, 1989). Aso Volcano, located in the northeastern area of Kumamoto-ken, is one of the largest active volcanos in Japan whose latest volcanic eruption occurred in October 20, 2021. Meanwhile, Aso Volcano is also a global geopark and world-famous hot spring resort, where millions of tourists come for leisure. In 2017, a major debris flow disaster occurred at Jiuzhaigou which is a World

Natural Heritage Site in China, and as a consequence, the number of tourists dropped by 32.6% compared with the previous year. But the number of tourists increased rapidly when Jiuzhaigou reopened in October 2021.

Driven by the frequent occurrence of natural disasters and the development of tourism, studies dealing with both tourist behavior and disaster risk management are increasingly conducted by the scientific community (Arain, 2015). Tourists are not only the bearers of disasters, but also the practitioners of disaster risk management in tourism destination (Zhou et al., 2012). When facing disasters, every tourist will have irrational attitudes, such as panic, anger, and even disappointment, which will affect his/her effective response to natural disasters and preservation of his/her own safety (Hao and Dong, 2021). The analysis of the risk perception and attitude of tourists in the context of natural disasters and its impact on travel behavioral intentions is the main focus of tourism destination disaster management practice and tourism behavior theory research.

Most of the literature is focused on the fields of tourism disaster risk emergency response, tourism disaster risk assessment, disaster impact, and post-disaster recovery. For instance, a database management subsystem and disaster relief management subsystem have been established to construct a tourism emergency management and rescue system in case of occurrence of sudden natural disasters (Zhao, 2020). Based on the principle of safety, the ecological security of forest tourism scenic spots was evaluated after freezing natural disasters (Feng, 2020), and the impact of geological disasters on the perceived image of tourist destinations was analyzed (Mao and Zhang, 2013). In some countries where tourism being the important economic industry, a nonlinear relationship between tourism and economic growth was found after the Wenchuan earthquake in China (Kim and Marcouiller, 2015). Under the dual influence of natural disasters and internal conflicts, the vulnerability and resilience of domestic and international tourists in India are significantly different (Okuyama, 2018; Yang et al., 2022). Based on the data of in-depth interviews and semi-structured questionnaires in two types of communities in Yuanyang County, Yunnan Province in China, Sun et al. (2015) analyzed the perception of disaster risk in tourism communities. The perceptions of local residents after the Wenchuan earthquake in China and residents of the Italian city L'Aquila community on disaster tourism destinations were explored. The study concluded that perceptions are both mixed and contradictory (Wright and Sharpley, 2018; Wang, 2019). A review of the literature suggests that there are still only few research studies that have been conducted on the impact of disasters on tourist behavior.

Therefore, the objectives of this study are to explore 1) the impact of tourists' emotional attachment, disaster knowledge, and disaster risk perception on tourists' behavioral intentions; and 2) the moderating effect of tourists' gender and education level on the relationship between disaster risk perception, disaster knowledge, emotional attachment, and tourists' behavioral intentions. Thus, the current study may have important implications for researchers and practitioners in understanding tourists' travel intentions and disaster risk perception and in developing suitable plans for tourism management in disaster-prone destinations.

2 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Risk Perception

Existing studies hold that risk can be considered as a measure of uncertain results. Disaster risk refers to the level of potential impact and its potential occurrence probability in the future. Risk perception, which was first discussed by Bauer (1960) in the consumer behavior field, is defined as the expectation of loss caused by uncertainty about the outcome that is likely to occur given the consumer's choice (Ahyoung, 2021). A representative study was Slovic Paul's theory of "personality profile" in 1987 which measured risk perception using the psychometric paradigm of risk perception (Slovic, 1987). Many studies have also measured risk perception from multiple dimensions, such as functional, physical, economic, social, and psychological risks, rather than a single component (Hong, 2015; Ahyoung, 2021). In the context of disaster tourism issues, such as natural disasters and landslides, risk perception is a comprehensive embodiment of disaster risk, exposure, vulnerability, and disaster prevention and reduction ability (Pan et al., 2016). Risk perception refers to people's feelings and understanding of risks taken in the surrounding world, including personal experience based on intuitive judgment and subjective feelings (Meng et al., 2010). It is also people's beliefs, attitudes, judgments, and emotions about hazards and its potential benefits, as well as cultural and social tendencies in the broader sense (Wu and Zhang, 2012).

In previous studies, risk perception has been widely taken as a key variable that affects people's travel intentions or as barriers to leisure travel. Pahl et al. (2005) explored that if a person thinks that he is at risk and feels vulnerable because of natural disasters, he is more likely to take pro-environmental action. Thus, risk perception is positively related to tourists' behavioral intention.

2.2 Disaster Knowledge

Knowledge is "a fact or condition of knowing something with a considerable degree of familiarity through experience, association, and contact" (Zhou et al., 2022). Hoffmann and Muttarak (2017) revealed that those who had been influenced by disaster in the past 3 years show nearly three times more preparedness behavior. Meanwhile, other literature studies demonstrated that disaster could improve people's experiences, especially for those who perceived the severity of the hazard (Wiwik, 2020). According to these studies, tourists' disaster knowledge refers to tourists' information about natural disasters that happened in tourism attractions.

Some studies found insignificant correlations between disaster knowledge and people's experiences (Sim et al., 2018). A person who can obtain disaster knowledge through different channels will show an overall lower impact on his/her risk perception. A person who has experienced natural disasters has a significant impact on his/her risk perception. Persons with past flood experience and flood knowledge education are quite sensible

to flood risk perception (Okaka and Odhiambo, 2019). The fear of experiencing an earthquake positively and indirectly affects the risk perception of earthquake survivors (Bronfman et al., 2020). Chinese residents' perception level of flood disaster risk is relatively low (Zhou and Liu, 2019), while residents' perception level of geological disaster risk in the mining area is relatively high (Feng and Ning, 2020). Li et al. (2011) found that disaster knowledge, as the most critical variable, has a significant impact on people's psychological and behavioral processes when sudden disasters such as earthquakes occur. Gao (2019) believed that the perceived use of new media and tourism information will affect the tourism behavior of youth groups. Therefore, there is a positive correlation in the relationship between disaster knowledge and tourists' intentions because of the disaster experience.

2.3 Emotional Attachment

Drawing upon the theory of attachment, place attachment refers to a person's complex emotional and affective response to a place or location, value, and attribution (Liu et al., 2021; Morais and Lin, 2010). It has been applied to investigate tourists' emotional, functional, affective, and social attachment to tourism destinations (Bowlby, 1969; Hidalgo and Hernandez, 2001; Kyle et al., 2004; Xu and Zhang, 2015). Place attachment has been conceptualized as a complex construct with multiple dimensions (Woosnam, et al., 2018). Researchers have proposed two (Hwang, 2005), three (Yuksel et al., 2010), and even four dimensions (Ramkinssoon et al., 2012) for place attachment.

Tourists' emotional attachment significantly affects their risk perception and travel behavioral attitude. A person's dependence on the place of disaster positively affects the perception of disaster risk. Participants from flood prone areas believe that the perception of flood risk is higher (Ullah et al., 2020). Most participants with a higher socio-economic status have higher risk perception of tsunami due to their residence being near the coastline (Gotham et al., 2018). By measuring risk perception, Shen et al. (2020) revealed that the presence of children or older people in the respondent's family induces a higher risk perception. There are significant differences in risk perception within the non-expert population and between the expert and non-expert populations (Pelling, 2011). Leiter (2011) found that risk and specific characteristics of individuals are important determinants of participants' perception of risk. Kim et al. (2016) found that an experience from past destinations only plays a regulatory role in the relationship between age and tourism risk perception (Jang et al., 2020). Therefore, there is a significant effect on emotional attachment for tourist behavioral intentions.

2.4 The Moderation of Gender and Education Level

Some studies found that women who had experienced geological disasters have higher risk perception of geological disasters and pay more attention to disaster knowledge (Yang et al., 2018).
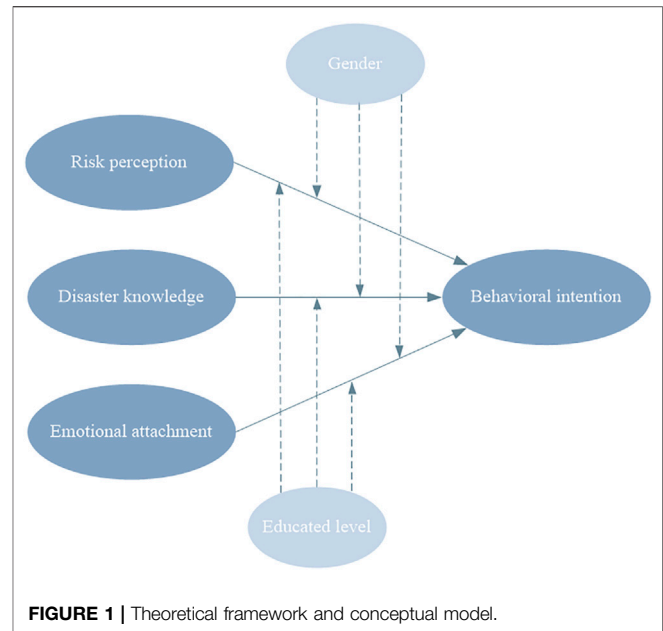

FIGURE 1 | Theoretical framework and conceptual model.

Women with high levels of risk perception tend to have negative attitudes toward disaster reduction (Yang et al., 2018). Other studies revealed that educated youth have significant intention to travel to places where they have been in their youth time for work, and the yacht tourists' behavior and attitude have a significant positive impact on their travel behavioral intention (Liu and Jia, 2018; Gou et al., 2020). Young people are usually the main demographic of tourists in mountain tourism destinations. Hu et al. (2014) analyzed the characteristics of mountain tourism recreation behavior in Wugong Mountain in China and found that there are mainly young students and tourists who are satisfied and willing to revisit the mountain tourism area. Zheng et al. (2016) also found that vacationers in the Nankun Mountain in Guangdong Province of China are mostly young and middle-aged tourists. Varasteh et al. (2015) studied the travel behavior of international students studying in Malaysia and found that most international students tend to travel during semester holidays for the purpose of entertainment and exploring new places. Youth group tourists pay attention to the tourism safety measures applied in mountain areas, but they have low safety awareness and lack of knowledge on mountain tourism safety (Cen and Huang, 2011).

Thus, different groups, such as male and female, and high education level and low education level, had different impacts on the relationship between tourists' risk perception, disaster knowledge, emotional attachment, and their travel behaviors (Gao et al., 2017).

2.5 Tourists' Behavioral Intention

Tourists' behavioral intention is defined as "subjective judgments about how we will behave in the future" (Ahyoung, 2021). In regard to disaster tourism matters, tourists' behavioral intention can be described as the extent to which groups will take actions to
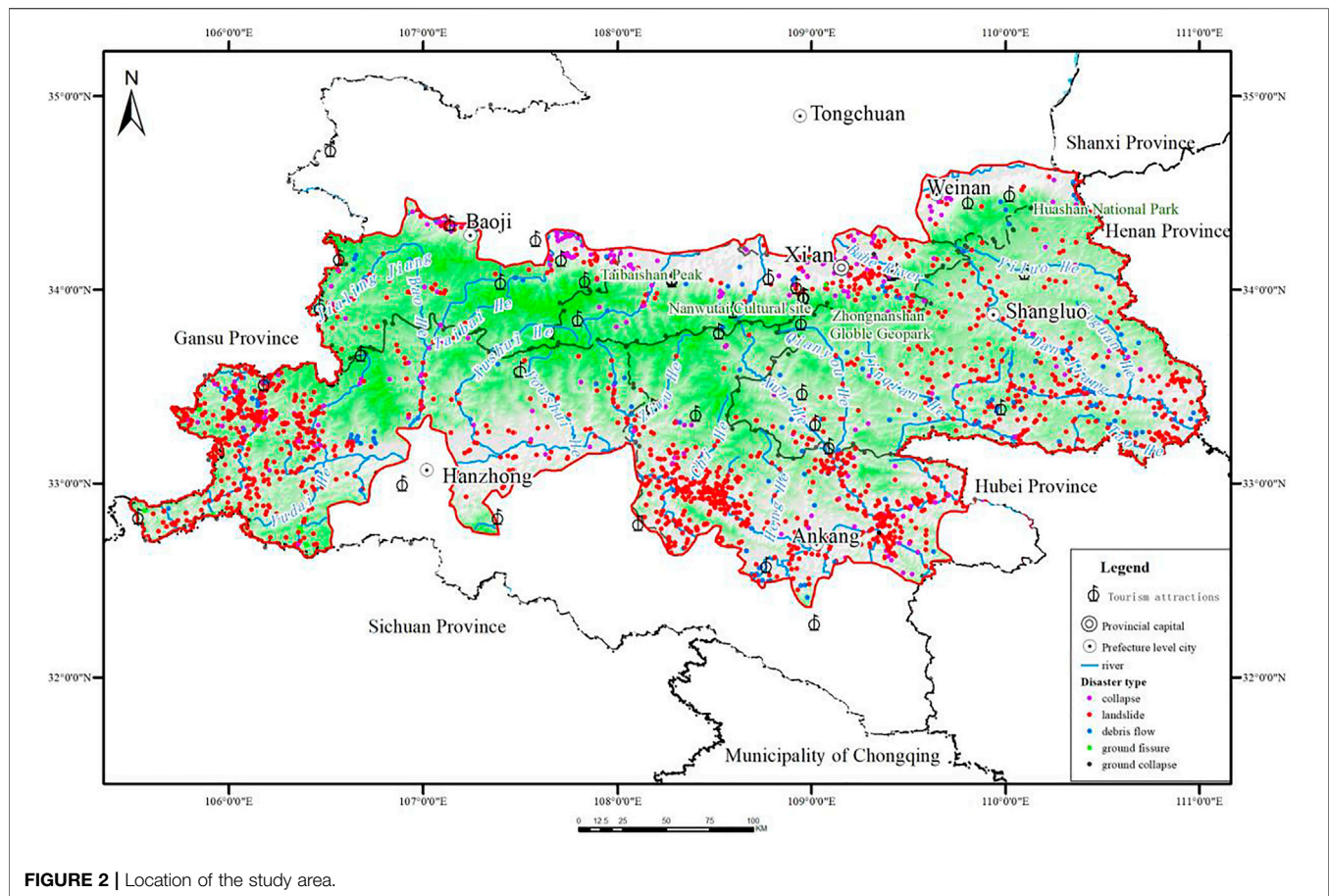
FIGURE 2 | Location of the study area.

continue their travel in various ways, such as overcoming all kinds of disaster impacts to visit tourist attractions in the future (Ramdas and Mohamed, 2014).

Based on the above literature review, we consider tourists' emotional attachment, disaster knowledge, and disaster risk perception as the main driving factors, and analyze the impacts on tourists' behavioral intentions in this study. Therefore, the following research framework and conceptual model of this study are developed (**Figure 1**).

3 METHODOLOGY

3.1 Study Area

The Qinling Mountain Range (32°28′53″-34°32′23″N, 105°29′18″-111°01′54″E) in the hinterland of Shaanxi Province in China stretches from the Jialingjiang River in the west to the Bahe River in the east. This range is connected with the Sichuan Basin in the south and the Loess Plateau in the north, spanning six cities of Shaanxi Province—Xi'an, Baoji, Weinan, Hanzhong, Ankang, and Shangluo (**Figure 2**).

The Qinling Mountain and Huaihe River are the watersheds between northern and southern China. The Qinling Mountain Range is about 1,600 km long from east to west and 300 km wide on average from north to south.

The average elevation is about 1,500 m with the highest peak, Taibaishan Peak (3,771.2 m above sea level), located in Baoji City. Situated between the subtropical zone and the temperate zone with a mountainous continental climate, the Qinling Mountain has an obvious vertical zonality. The annual precipitation can reach 1,000–1,300 mm, creating climatic conditions very conductive to the formation and development of landslide and debris flow in Qinling Mountain.

Known as the "Central National Park of China," rich natural resources and historical culture in Qinling Mountain feed numerous tourism attractions, such as the Huashan National Park, Zhongnanshan Global Geopark, and Nanwutai Cultural site, and their exotically beautiful landscapes attract tourist attention worldwide.

In fact, quite a few tourist attractions in Qinling Mountain frequently suffer heavy geological hazards (Ma et al., 2021). According to the investigation results of Shaanxi Geological Survey Department, landslide and debris flow that existed in the Qinling Mountain caused an average of 55 people missing or dead each year with a direct economic loss of 57 million RMB.

3.2 Questionnaire Development

To measure the constructs proposed in the conceptual model, a questionnaire was first developed based on previous studies and then tested on 30 college students. The final questionnaire was

TABLE 1 | Latent variables and measurement items used in the conceptual model.

Latent variable	Measurement item	Source
Risk perception	-Natural disasters in Qinling Mountains are severe	Fuchs and Reichel (2006)
	-Natural disasters in Qinling Mountains are frequent	
	-Natural disasters in Qinling Mountains occur with great intensity	
	-Natural disasters in Qinling Mountains are horrible	
	-Natural disasters in Qinling Mountains are worrying	
	-Natural disasters in Qinling Mountains are anxious	
Disaster knowledge	-Tourist attractions of Qinling Mountains are in good order	Sun et al. (2015)
	-Tourist attractions of Qinling Mountains are well-known	
	-Tourist attractions of Qinling Mountains are well serviced	
	-The emergency measures of tourist attractions are in place	
	-The disaster information of tourist attractions is issued immediately	
	-The disaster information of tourist attractions is accurate	
Emotional attachment	-The scenery of Qinling Mountains is unique	Tang et al. (2007)
	-The scenery of Qinling Mountains is sacred	
	-The history of Qinling Mountains is ancient	
	-Travelling in Qinling Mountains is unforgettable	
	-Travelling in Qinling Mountains is missing	
	-Travelling in Qinling Mountains is excited	
Behavioral intention	-Once the natural disaster is over, I will still travel to Qinling Mountains	Li et al. (2020)
	-Once the natural disaster is over, I think it's still a good idea to travel to Qinling Mountains	
	-Once the natural disaster is over, I am very happy to travel to Qinling Mountains	
	-No matter what disaster happens, I will still travel to Qinling Mountains	
	-No matter what disaster happens, I think it's still a good idea to travel to Qinling Mountains	
	-No matter what disaster happens, I am very happy to travel to Qinling Mountains	

composed of 24 measurement items, which are described in **Table 1**. A 5-point Likert-type scale was used to measure each statement of risk perception, disaster knowledge, emotional attachment, and behavioral intentions (from 1 = strongly disagree to 5 = strongly agree).

1) The measurement of disaster risk perception is based on the research items published in Fuchs and Reichel's (2006) tourism disaster risk perception, including six items in terms of the risk of disaster-causing factors and the vulnerability of the carrier.
2) The measurement of disaster knowledge is based on the scale of Sun et al. (2015). It refers to acquisition channels, timeliness, and accuracy of natural disaster information in Qinling Mountains. There are three items in total.
3) The emotional attachment of tourists is measured with six items that are based on the scale of Tang et al. (2007). Among them, emotion refers to the unique, sacred, and ancient history of Qinling Mountains, and attachment corresponds to the nostalgic, unforgettable, and exciting tourism experience of Qinling Mountains.
4) The measurement of tourists' behavioral intentions refers to the tourists' behavioral intention items of Li et al. (2020), and analyzes the tourists' behavioral intentions and willingness of tourists when confronted with disasters. There are three items in total.

3.3 Data Collection and Analysis Tool

This analysis investigates the perception and influencing factors of tourism disaster risk in Qinling Mountains using youth group tourists. The data are obtained from a questionnaire survey. The first survey was conducted during winter season in Qinling Mountain in January 2021, and the second survey was conducted before the summer season in May 2021 to collect a comprehensive dataset. Two surveys were conducted in the form of electronic questionnaires, and a total of 542 questionnaires were received. Then, a range between 15 and 44 was defined as the age of youth group tourists. After screening, 511 questionnaires were considered valid, with an effective rate of 94.3%. The survey results were imported into SPSS 25.0 software for sample descriptive statistical analysis, and the results are shown in **Table 2**.

In terms of gender distribution, males accounted for 42.1% and females accounted for 57.9%. Concerning education level, most of them have a good education level: 279 tourists have a master's degree or above, accounting for 54.6%; 219 tourists have a college or bachelor's degree, accounting for 42.9%; and 13 tourists have a diploma of high school, vocational school, or technical secondary school and junior middle school or below, accounting for 2.6%. From the perspective of personal monthly income, 172 tourists earned below 1,000 RMB, accounting for 33.7%, followed by 5,000–10,000 RMB, 1,001–3,000 RMB, 3,001–5,000 RMB, and more than 10,000 RMB, accounting for 22.1, 20, 14.1, and 10.25%, respectively. In terms of current residence, 248 tourists currently live in Xi'an city which is the capital city of Shaanxi Province, accounting for 48.5%, while 20.2% live in other areas of Shaanxi Province and 31.3% live in other provinces. The occupations of the survey participants are mainly students; enterprise managers; personnel of public institutions; and professional, cultural, educational, scientific, and technological personnel, accounting for 53.6, 11.4, 11.2, 9, and 6.5%, respectively. There are a few state agency personnel, workers, service personnel, soldiers, farmers, and retirees, accounting for less than 10% of the total participants. Based

TABLE 2 | Sample description.

Category	Number	Proportion (%)	Category	Number	Proportion (%)		
Gender	Male	215	42.1	Current residence	Xi'an city	248	48.5%
	Female	296	57.9		Other areas of Shaanxi Province	103	20.2%
Age	15–24	277	54.2		Other provinces	160	31.3%
	25–44	234	45.8		State organizations	15	2.9%
	Junior middle school and below	2	0.4		Personnel of public institutions	46	9.0%
	High school/vocational school/ technical secondary school	11	2.2		Enterprise manager	57	11.2%
Education degree	College/undergraduate	219	42.9	Occupational	Professional/cultural educational/scientific and technological personnel	33	6.5%
	Master's degree and above	279	54.6		Service personnel	10	2.0%
	Below 1,000 RMB	172	33.7		Student	274	53.6%
	1,001–3,000 RMB	102	20.0		Worker	12	2.3%
Monthly income	3,001–5,000 RMB	72	14.1		Soldier	2	0.4%
	5,000–10,000 RMB	113	22.1		Farmer	3	0.6%
	More than 10,000 RMB	52	10.2		Retiree	1	0.2%
					Other	58	11.4%

TABLE 3 | Reliability testing.

Factor	Cronbach's alpha	Extracted item
Tourists' emotional attachment	0.951	6
Disaster knowledge	0.940	3
Disaster risk perception	0.946	6
Travel behavioral intention	0.919	3
The whole reliability	0.936	18

on the above analysis, the research object and data have been considered with enough quality to meet the research objective.

4 RESULTS

4.1 Reliability and Validity Testing

In order to test the adaptability between the item and the variable factor, a single-factor test was applied. The results show that a total of 4 factors and 18 items can be extracted and their eigenvalues are all greater than 1, and the interpretation rate of cumulative variance after rotation is 78.2%, indicating that 18 items in this study have good adaptability to variable factors.

In this study, SPSS software was used to analyze the reliability and validity of the questionnaire. In the reliability test, it is generally considered that if the Cronbach's alpha coefficient is greater than 0.7, the date would have high reliability. The Cronbach's alpha coefficients of the four variables in this study are shown in **Table 3**, as follows: 0.951, 0.940, 0.946, and 0.919, respectively, and the overall reliability is 0.936, indicating that the data are highly reliable and can be considered for further analyses. In addition to the reliability test, the content and structure validity were also examined. Since the variable measurement items draw on the mature scales of existing research, they have good content validity. A KMO test was conducted to test for structural validity. The KMO

value of this questionnaire is 0.920, and the significance in the Bartlett sphere test is 0.000, less than the significance level of 0.05, indicating that the research data have good discriminant validity.

4.2 Empirical Analysis of the Interaction Relationship

4.2.1 The Effect of Tourist Emotional Attachment on Tourist Behavioral Intentions

Taking the tourism emotional attachment as an independent variable and the tourists' behavioral intentions as a dependent variable, and using SPSS for linear regression analysis, we can get the result of the effect of disaster knowledge on tourists' behavioral intentions, as shown in **Table 4**.

It can be concluded from the aforementioned results that the regression equation between the variables is as follows: Travel Behavioral Intentions = 1.805 + 0.464* Travel Emotional Attachment. The model collinearity VIF is less than 5, indicating that there is no multicollinearity, and the results can be considered as true and reliable. The p-value is 0.000, which is less than the significance level of 0.05, indicating that travel emotional attachment significantly affects travel behavioral intentions. $R^2 = 0.153$, which means that travel emotional attachment explains travel attitude and behavior with the change of 15.3%. We found that the regression coefficient of tourism emotional attachment is 0.464, which is more than 0, indicating that tourism emotional attachment has a positive and significant impact on tourists' behavioral intentions.

4.2.2 The Effect of Disaster Knowledge on Tourist Behavioral Intentions

Taking the disaster knowledge of tourism destination as an independent variable and the tourists' behavioral intentions as a dependent variable, and by using SPSS for linear regression analysis, we can get the result related to the effect of the disaster knowledge on the tourists' behavioral intentions, as presented in **Table 5**.

TABLE 4 | Analysis of the impact of emotional dependence perception on tourists' behavioral intentions.

	Non-standardized coefficient		Standardized coefficient	t	Significance	VIF
	B	Standard error	Beta			
(Constant)	1.805	0.101		17.931	0.000	
Tourists' emotional attachment	0.464	0.048	0.392	9.599	0.000	1.000

TABLE 5 | Analysis of the impact of disaster knowledge perception on tourists' behavioral intentions.

	Non-standardized coefficient	Standardized coefficient		t	Significance	VIF
	B	Standard error	Beta			
(Constant)	1.542	0.118		13.103	0.000	
Disaster knowledge	0.520	0.050	0.418	10.378	0.000	1.000

TABLE 6 | Analysis of the impact of disaster risk perception on tourists' behavioral intentions.

	Non-standardized coefficient	Standardized coefficient		t	Significance	VIF
	B	Standard error	Beta			
(Constant)	2.041	0.119		17.181	0.000	
Disaster risk perception	−0.260	0.044	0.252	5.870	0.000	1.000

Based on the aforementioned results, the regression equation between variables is as follows: Tourists' Behavioral Intentions = 1.542 + 0.520*Disaster knowledge. The model collinearity *VIF* is less than 5, indicating that there is no multicollinearity, and the results are true and reliable. The *p*-value is 0.000, less than the significance level of 0.05, indicating that the disaster knowledge significantly affects tourists' behavioral intentions. $R^2 = 0.175$, which indicates that the disaster knowledge can explain tourism behavior intentions with the reason for the change of 17.5%. We found that the regression coefficient of the disaster knowledge is 0.520, which is more than 0, indicating that the disaster knowledge has a significant positive impact on the tourists' behavioral intentions.

4.2.3 The Effect of Disaster Risk Perception on Tourists' Behavioral Intentions

Taking the disaster risk perception as an independent variable and the tourists' behavioral intentions as a dependent variable, and by using SPSS for linear regression analysis, we can get the result of the effect of the disaster risk perception on the tourists' behavioral intentions, as presented in **Table 6**.

Based on the aforementioned results, it can be concluded that the regression equation between variables is as follows: Tourists' Behavioral Intentions = 2.041–0.260*Disaster Risk Perception. The model collinearity *VIF* is less than 5, indicating that there is no multicollinearity, and the results are true and reliable. The *p*-value is 0.000, which is less than the significance level of 0.05, indicating that disaster risk perception significantly affects tourism behavior. $R^2 = 0.063$, which means that disaster risk

perception can explain tourism behavior intentions with the change of 6.3%. We found that the regression coefficient of the disaster risk perception is −0.260, which is less than 0, indicating that the disaster risk perception negatively affects travel behavioral intentions.

4.3 Moderating Effect Analysis
4.3.1 Gender Moderating Effect

Hierarchical regression analysis was used in this study to analyze the moderating effect of gender. We investigated whether gender moderates the relationship between independent variables and youth group tourism behavioral propensity, as presented in **Table 7**.

From Model 1 in **Table 7**, it can be seen that tourism emotional attachment and disaster knowledge positively influence tourists' behavioral intentions and disaster risk perception negatively influences the travel behavioral intentions of youth groups. Model 2 added the moderating variable gender, and model 3 added the interaction of gender and independent variable based on output from model 2. The results showed that the interaction coefficient between gender and tourism emotional attachment was 0.073 ($p > 0.05$), the interaction coefficient between gender and disaster knowledge was 0.170 ($p > 0.05$), and the interaction coefficient between gender and disaster risk perception was 0.113 ($p > 0.05$). We can conclude that gender did not play a significant moderating role in the relationship between emotional attachment to tourism, disaster knowledge, perception of disaster risk, and youth group behavioral intentions.

TABLE 7 | Analysis of the moderating effect of gender.

Variable name	Travel behavioral intention		
	Model 1	Model 2	Model 3
Constant	1.805**	1.704**	1.695**
	(17.931)	(10.918)	(10.825)
Emotional attachment	0.464**	0.462**	0.466**
	(9.599)	(9.546)	(9.571)
Gender		0.066	0.067
		(0.845)	(0.853)
Gender×Tourists' emotional attachment			0.073
			(0.755)
R^2	0.153	0.154	0.155
F	92.145	46.404	31.100
Constant	1.542**	1.236**	1.211**
	(13.103)	(6.992)	(6.838)
Disaster knowledge	0.520**	0.531**	0.546**
Gender	(10.378)	(10.593)	(10.746)
		0.178*	0.176*
		(2.308)	(2.290)
Gender×Disaster knowledge			0.170
			(1.702)
R^2	0.175	0.183	0.188
F	107.702	56.973	39.090
Constant	2.401**	1.943**	1.924**
	(17.181)	(11.401)	(11.262)
Risk perception	−0.260**	−0.257**	−0.262**
	(5.870)	(5.794)	(5.881)
Gender		0.067	0.068
		(0.808)	(0.831)
Gender× Risk perception			0.113
			(1.270)
R^2	0.063	0.065	0.068
F	34.459	17.544	12.248

** means $p < 0.01$, * means $p < 0.05$.

4.3.2 The Moderating Effect of Education Level

Taking tourism emotional attachment, disaster knowledge, and disaster risk perception as independent variables, and education level as a moderator variable, we studied, this time, whether education level played a moderating role in the relationship between the independent variables and the travel behavioral intentions of youth groups, as presented in **Table 8**.

From Model 1 in **Table 8**, it can be seen that tourism emotional attachment and disaster knowledge have a positive and significant impact on tourists' travel intentions; disaster risk perception has a negative impact on the travel behavioral intentions. Model 2 added the moderating variable of education level, and model 3 added the interaction term between education level and independent variable based on output from model 2. The results showed that the interaction coefficient between education level and tourism emotional attachment was 0.152 ($p > 0.05$), and the interaction coefficient between education level and disaster knowledge is 0.181 ($p < 0.05$). It indicated that education level has a significant moderation role between disaster knowledge and tourists' behavioral intentions, which indicates that high education level strengthens this relationship and low education level weakens it. At the same time, we did not find a significant moderation role of education level on emotional attachment and travel intentions. Education level did not play a

significant moderating role in risk perception and travel intentions.

5 DISCUSSION

Taking youth group tourists as our research object, this study analyzes the relationship between risk perception, disaster knowledge, and emotional attachment and the tourists' travel behavioral intentions in disaster-prone tourism destinations. We investigated the moderation role of tourists' gender and their education level and discussed the different interaction relationships with different gender and education level conditions. The research shows that disaster risk perception has a negative and significant effect on tourists' behavioral intentions, while disaster knowledge and tourism emotional attachment have significant and positive effects. In further study, we found the tourists' education level has a stronger moderation than their gender.

5.1 Tourists' Emotional Attachment Positively Affects Tourists' Travel Behavioral Intentions

Previous tourism and hospitality research published in the literature shows that tourism emotional attachment of a visitor will be beneficial to his/her travel attitudes and behavioral intentions (Kim et al., 2017). Yuksel et al. (2010) found a strong link between place attachment and visitors' satisfaction, a key determining factor of tourists' attitude (Prayag & Ryan, 2012). Tourism emotional attachment can be a good predictor of visitors' emotional experience of satisfaction and might have a direct effect on destination loyalty. It has been found that tourists' attachment has an indirect significant positive effect on their behavioral intentions (e.g., revisit intentions and travel purchase intentions) (Cheng et al., 2017).

According to the analysis results, young tourists' emotional attachment to Qinling Mountains positively and significantly affects their travel behavioral intentions. The higher the emotional attachment level of the youth group to Qinling, such as emotional experience and cognitive level, the stronger their behavioral willingness to travel to this area will be.

5.2 Disaster Knowledge Positively Affects Tourists' Travel Behavior Intentions

It is reasonable to assume that changing travel environment also impacts travelers' preference of travel services. The sociological concept of "cocooning" is widely used in social science to explain the human behavior when a person prefers to stay in his/her room instead of going out (Wut, et al., 2021).

According to the results of our empirical analysis, among youth group tourists who visited Qinling Mountains, the quality of disaster knowledge has a positive and significant impact on their travel behavioral intentions. When youth group tourists got access to the information of natural disasters in Qinling Mountains as comprehensively and accurately as possible, such

TABLE 8 | Analysis of the moderating effect of education level.

Variable name	Travel behavioral intention		
	Model 1	Model 2	Model 3
Constant	1.805**	1.517**	1.532**
	(17.931)	(5.782)	(5.850)
Tourists' emotional attachment	0.464**	0.465**	0.452**
	(9.599)	(9.616)	(9.255)
Education level		0.081	0.084
		(1.187)	(1.228)
Education level×Tourists' emotional attachment			0.152
			(1.786)
R^2	0.153	0.156	0.161
F	92.145	46.813	32.407
Constant	1.542**	1.414**	1.472**
	(13.103)	(5.418)	(5.626)
Disaster knowledge	0.520**	0.519**	0.508**
	(10.378)	(10.328)	(10.091)
Education level		0.037	0.029
		(0.548)	(0.424)
Education level×Disaster knowledge			0.181*
			(2.088)
R^2	0.175	0.175	0.182
F	107.702	53.927	37.642
Constant	2.041**	1.684**	1.692**
	(17.181)	(5.880)	(5.972)
Risk perception	−0.260**	−0.263**	−0.264**
	(5.870)	(5.946)	(1.339)
Education level		0.099	
		(1.371)	(1.200)
Education level×Risk perception			0.097
R^2	0.063	0.067	0.069
F	34.459	18.199	12.623

*** means p < 0.01, * means p < 0.05.*

as the time, frequency, and damage degree of disaster, their travel intentions and travel behavioral intentions became more obvious.

5.3 Disaster Risk Perception Negatively Affects Tourists' Travel Behavioral Intentions

Existing research studies in the literature found that threat severity and susceptibility can induce "travel fear," which leads to protection motivation and protective travel behaviors after the outbreak of the COVID-19 pandemic (Zheng, et al., 2021). Findings also revealed that "travel fear" can trigger different coping strategies, which increases people's psychological resilience and adoption of cautious travel behaviors. Second, disease has an impact on tourists' behaviors; one possible explanation is that travelers might develop adaptive behaviors (personal health interventions) which may prevent them from contracting the disease (Cahyanto, et al., 2016). The pandemic is also likely to change tourists' lifestyles, travel behaviors, and patterns (Guan, et al., 2020).

The analysis of the results concludes that the tourists' perception of disaster risk has a negative impact on the tourists' behavioral intentions of youth group tourists in Qinling Mountains. If the youth group has a greater perception of the risk of various natural disasters of Qinling Mountains, they may cancel their travel plans or change to

another destination. On the contrary, if they positively perceive the potential risk of Qinling Mountain, they may keep their travel plans.

5.4 Differences in the Relationship Between Different Genders and Education Level

According to the analysis results of the moderating effect of gender and education level, the moderating effect of gender is non-significant, but the moderation role of education level is significant which has a positive moderating effect on disaster knowledge for tourists' travel intentions. In other words, there is no significant difference between male tourists and female tourists with regard to their behavioral tendencies. Tourists with a high education level can comprehensively and accurately assimilate the information of various natural disasters about tourism destinations, which strengthens the relationship between disaster knowledge and their travel behavioral intentions.

6 CONCLUSION

6.1 Theoretical Implications

This analysis expands the theoretical study on risk perception of tourism disaster. First, on the basis of explaining the concepts of

disaster risk, risk perception, and tourism perception, combined with the current research literature, we constructed a research framework for analyzing the influencing factors of tourists' travel behavioral intentions in disaster-prone tourism destinations. Second, risk perception theory and TPB were applied jointly in this study, and risk perception and tourism emotional attachment were both taken as influencing factors to expand the category of influencing factors of tourists' behavioral intentions in TPB. Third, we analyzed the moderating role of tourists' gender and their education level, which enriches the research on the moderating effects in tourism disaster management studies.

6.2 Managerial Implications

The conclusion has great importance for policymakers dealing with the risk management in disaster-prone tourist destinations. On the one hand, tourism destinations can strengthen tourists' emotional experience of destinations through well-provided services, good tourist images, and unforgettable tourist experiences, and thereby promoting their willingness to travel again. On the other hand, tourism destinations need to release natural disaster knowledge comprehensively, such as the time and damage degree of disasters, through various channels via Internet, TV, and social media, to help tourists establish a positive risk perception. And, well-educated tourists should be regarded as the main source of tourists in the Qinling Mountains destination, take them as the target tourists for the Qinling Mountains, and promote and serve them well.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

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