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Research paper

Predicting tourists' health risk preventative behaviour and travelling satisfaction in Tibet: Combining the theory of planned behaviour and health belief model

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ABSTRACT

Both the theory of planned behaviour (TPB) and the health belief model (HBM) are important theories to analyse health-related behaviours; however, few studies have combined these theories to explore health risk issues in the tourism context. This paper explores the relationships underlying travelers' health beliefs, attitudes, self-efficacy, preventative behaviours, and travelling satisfaction during trips to high-altitude destinations. Tibet in China was chosen as the case and the data are analysed by Mplus 7.4 with the WLSMV estimator. The results show that perceived susceptibility and perceived benefit can be regarded as important antecedent beliefs in attitudes toward preventative behaviours; health beliefs and self-efficacy positively influence preventative behaviours; and there are significant indirect relationships from health beliefs to preventative behaviour. Moreover, risk preventative behaviour is found to be a positive determinant of travelling satisfaction during a trip. Findings also revealed that TPB can be supported and extended by combining constructs of HBM.

1. Introduction

Travel is a complicated process inherently involving a certain level of risks and uncertainties, such as the complex nature of the tourism industry and a high degree of vulnerability to unsystematic risks (Fuchs 2013; Williams & Baláž 2015), which have an influence on people's attitudes toward engaging in protective behaviours (Larsen, Brun, & Lugosi 2011; Quintal, Lee, & Soutar 2010). Health risks, as an integral part of the nature of travel, could endanger the safety and security of travelers (Jonas, Mansfeld, Paz, & Potasman 2011). Furthermore, with the increasing flow of information and the improvement of people's safety awareness, health risks have become a significant concern for tourists, and risk perceptions would affect tourists' travel decisions (Jonas et al. 2011; Page 2009). When a tourist suffers from a disease or encounters dangers during a trip, it can pose problems for tourists and suppliers as well as managers in the tourism industry (Peattie, Clarke, & Peattie 2005). Therefore, proper management of health risks would help travelers to reduce their concerns and result in a better travelling experience. It is also conductive for destinations, especially for those destinations with high risks, to establish the destination image of safety and risk controls.

According to previous studies, management of tourists' health risks is related to health beliefs and risk prevention behaviours (Quintal et al. 2010). The Health Belief Model (HBM) is the most prominent socio-behavioral model used to explain health behaviour, especially to predict behaviours to avoid a range of health risk (e.g., for a review see Janz & Becker 1984). In the tourism context, examining tourists' health beliefs could provide a more comprehensive model to understand risk perception (perceived susceptibility, perceived severity), perceived costs and benefits of such behavior, which can also help public health officials to focus education efforts for travelers, especially those who showed higher concern over the risk (Cahyanto, Wiblishauser, Pennington-Gray, & Schroeder 2016). Yet, most previous studies have mainly used TPB to study the impact of risk perception on behavior, but lack of inclusion of more comprehensive health beliefs and their impact on attitudes and behaviours.

Tourists' risk perceptions and protective behaviours further influence travel satisfaction in the experience stages (Li, Pearce, Wu, & Morrison 2015), which can provide a new perspective for destination to improve tourist satisfaction and experience.This is particularly important for destinations where there are risks that cannot be eliminated but tourists can take measures to protect themselves. However, few existing studies have included travel satisfaction during tourist trips when talking about risk perceptions and protective behaviour. Thus,

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this study attempts to meet the gaps by investigating the relationships among traveler's general health beliefs, their risk prevention behaviours, and their satisfaction when travelling.

The theory of planned behaviour (TPB) and health belief model (HBM) are theoretical frameworks frequently used in the analysis of health-related behaviours and have been successfully adapted to fit diverse contexts (Gerend & Shepherd 2012; Hagger & Chatzisarantis 2011; Jones et al. 2015). TPB focuses on the influences of subjective norms, individual attitudes, and perceived behavioral control on people's behaviours (Ajzen 1991), while HBM highlights the importance of the impacts of health beliefs on prevention behavior (Janz & Becker 1984). Nevertheless, both theories include overlapping constructs and emphasize the importance of different kinds of beliefs in predicting individual behaviours. Therefore, it's necessary to combine the two theories to identify specific constructs that influence certain behaviours, which will help to improve our understanding about risk prevention behaviours (Gerend & Shepherd 2012). In the current study, a combined model that includes constructs from the HBM and TPB is used to examine the relationship among travel health beliefs, attitudes, self-efficacy, and risk prevention behaviours in the tourism context.

Tibet is a special attractive tourist destination because of its unique natural and cultural background. In 2010, Tibet received 6.82 million tourists; in 2017, the number of tourists exceeded 25 million (Su & Wall 2009). However, because the average altitude of Tibet is above 3000 m, and because many people easily suffer from altitude sickness and other health problems in such environments, tourists are frightened by potential health risks in Tibet, even though they are attracted by the high-quality tourism attractions. As the result, it is observed that potential tourists always have a willingness to visit Tibet, but the actual visiting rate is low (Li, Yan, & Yun 2014). The purpose of this paper is to integrate the TPB and HBM to investigate relationships underlying travelers' health beliefs, their attitude and self-efficacy to preventative behaviour, and travelling satisfaction at high-altitude destinations. It attempts to provide useful insights into risk management and development of tourism in high-altitude destinations, thereby reducing the psychological burden of tourists to Tibet and improve travel satisfaction.

2. Related concepts and research hypotheses

2.1. Health risks in tourism

Researchers have identified different kinds of potential risks in tourism, including equipment, financial, political, physical, and social psychological as well as health dimensions (Kozak, Crotts, & Law 2007; Reisinger & Mavondo 2005; Schmude, Zavareh, Schwaiger, & Marion 2018). Among them, health risks have become a significant issue associated with tourists' concerns and affected tourists' travel decisions (Jonas et al. 2011; Page 2009). Here health risk refers to “the development of diseases or other health impairments as a result of tourism experiences (e.g. traveller diarrhoea)” (Peattie et al. 2005); these health risks are the most prevalent and to a large extent, they are not life-threatening (Page 2009). Health risk in a tourism destination is significantly related to personal health as well as wellbeing (Jonas et al. 2011). Tourists' health risk perception toward a destination plays an important role in their decision-making process, which will also impact their health-preventative behaviour and the quality of their trip, therefore, the importance of studies on tourists' health risk is growing significantly (Chien, Sharifpour, Ritchie, & Watson 2017). Although considerable attention is being paid to travel health risks in tourism studies, several problems in the extant literature have been also identified.

First, previous research suggests that the examination of tourist health risk issues should be under the guidance of the theoretical framework and should recognize the value of integrative models to improve current analysis of risks (Wang, Liu-Lastres, Ritchie, et al. 2019; Williams & Baláž 2015). Specifically, travelers' self-protections behaviour against health risk is a critical research issue. In a recent research, protection motivation theory is used to explore the Psychological mechanisms about the travelers' rabies prevention behavior (Wang et al. 2019). Protection motivation theory highlights the influence of perceived threat and perceived copping cost or efficiency on protective behaviour (Verkoeyen & Nepal 2019). Protection motivation theory also suggests that health belief, such as the perceived vulnerability or severity toward health risk, is a multidimensional variable. The influence from beliefs about health risk to risk prevention behaviour needs more exploration. The combined model of TPB and HBM would be helpful in assessing their influences on people's travel behaviour. Different health beliefs (risk susceptibility, risk severity, benefits, barriers, cues) have been substantiated as important indicators to explain and predict individuals' health-related behaviour in the HBM (Janz & Becker 1984; Jones et al. 2015). Based on TPB model, there might be a mediating effect of risk prevention attitude in the relationship of travelers' health risk beliefs and protective behaviour (Chien et al. 2017). To integrate health beliefs and TPB to investigate tourists' risk preventative behaviour would contribute to the understanding of the psychological process of tourists preventative behaviour.

Second, the relationship between health risk and tourism runs through three stages: the pre-travel phase, the travel phase and the post-travel phase (Page 2009), yet most existing studies have predicted the impacts of risk perceptions on behavioral intentions in tourists' information searching and travel decision-making stage (Chien et al. 2017), with few including the satisfaction during their travel when talking about tourists' risk perception and their protective behaviours. Page (2009) indicated that issues associated with tourists' satisfaction and how perceived risk may have an impact upon it should be given more attention in tourism studies and emphasis the important role of prevention–risk behaviour in travel preparations and on holiday. Therefore, in order to better understand tourists' health risk behaviours and their travel experience, a combined model of TPB and HBM is applied to analyse tourists' health beliefs and prevention behaviours on their pre-travel stage and satisfaction on their travel phase.

Third, most studies thus far have focused mainly on climate change, political and terror risks and less on health concerns (Chien et al. 2017; Fuchs, Uriely, Reichel, & Maoz 2013; Wilkins, Urioste-Stone, Weiskittel, & Todd 2018), especially on high-altitude destinations (Mu & Nepal 2016). Some studies have investigated perceived risks related to specific destinations because of their special attributes, such as bad weather, inedibility of local food, crime, disease, and natural disasters (Fuchs & Reichel 2006). The major effect of high altitude on human physiology is decreased oxygen content in the arterial blood, which may lead to different degrees of mountain sickness and affect a tourist's experience (Musa, Hall, & Higham 2004). According to Walker and Page (2003), risk perception is subject to variable intensity and severity levels; for example, some risks, e.g., terrorism, are rare, but their consequences are severe; and, while health risks generally have high frequency, their seriousness is relatively minor. There are also severe risks in Tibet, e.g., traffic accidents and natural disasters, but, because of their low frequency of occurrence, many tourists do not perceive them as being an issue. In the current paper, we mainly focus on perceived health problems, including diarrhea, altitude sickness, and catching a cold because of two reasons. First, these are common risks in high-altitude destinations. If these risks appear, they're likely to bring various losses as well as injuries to tourists and negative impacts on the destination's healthcare system. Second, tourists are more likely to encounter these risks than locals due to their nonfamiliarity with the geography and climate of the destination. Third, these health risks can be prevented or their impact can be minimized through health-protective behaviours (e.g., taking medicine) (Chien et al. 2017; Page 2009).

2.2. Conceptual model

The TPB is an extended model of the theory of reasoned action and is widely used to predict various behaviours (Fishbein 2001; Zoellner et al. 2017). According to TPB, behaviour intentions are determined by attitude, subjective norm, and perceived behavioral control (Ajzen 1991). Attitude toward the behaviour indicates a person's overall evaluation of the behaviour. Subjective norms refer to perceptions of how other people think someone should behave the particular behaviour. Perceived behavioral control (PBC) is perceived personal control over carrying out the behaviour (Bish, Sutton, & Golombok 2000). TPB is intended to be one of the salient models to measure travelers' health risk perceptions and protective behaviours (Quintal et al. 2010), including in the context of alcohol consumption, exercise, and disease prevention (Cooke, Dahdah, Norman, & French 2016; Darker, French, Eves, & Sniehotta 2010; Gerend & Shepherd 2012).

The HBM was first developed to understand why people did not accept preventives or screening tests for diseases (Janz & Becker 1984). Later, it was applied to patients' responses to health-related actions (Becker 1974; Rosenstock 2010). It is also one of the mostly commonly used models in health-related research to explain and predict human health practice as well as health preventative behavior (Aree-Ue & Petlamul 2013; Carpenter 2010). The HBM assumes that individuals take preventative behaviours when they believe there is high likelihood to acquire a disease (perceived susceptibility), there are severe negative impacts of the disease (perceived severity), there are benefits to gain by adopting health behavior, and there are fewer barriers against enacting the health behavior (Taymoori, Molina, & Roshani 2014). Acknowledging personal health beliefs and the effects of health beliefs on their attitude toward preventive behavior may be the first in a chain of events toward health promotion, with which health educators can utilize risk communication with a sound foundation in the underlying mechanisms (Greening, Stoppelbein, Chandler, & Elkin 2005). However, few studies have been conducted to test the impacts of health beliefs on health risk prevention behavior in the tourism context.

Both TPB and HBM are based on an expectancy-value framework and assume that health decision-making is a rational process (Gerend & Shepherd 2012). According to Ajzen (1991), beliefs are the ultimate psychological determinants of behavior, and behavioral beliefs are assumed to influence attitudes. HBM and TPB were combined tested in injury prevention program and health-related behaviours. Results show that HBM and TPB have strong psychometric properties to assess behavioral determinants of intention to take prevention behavior (Gabriel, Hoch, & Cramer 2019). The two models are complementary in some aspects, and health beliefs can be regarded as determinants of attitude. In the current study, related variables in both TPB and HBM are integrated to better understand tourists' risk preventative behavior and travel satisfaction.

2.3. Hypothesizes development

2.3.1. Attitude, self-efficacy, and preventative behaviour

Self-efficacy can be conceptualized as “beliefs in one's capabilities to organize and execute the courses of action required to produce given levels of attainments” (Bandura 1998, p. 624), which is a significant predictor of health preventative behaviours (Stewart, Wolfe, Maeder, & Hartz 1996). In the TPB, PBC is supposed to influence behavior directly. Ajzen (1991), however, argues that the PBC and self-efficacy constructs are interchangeable. A decade later, based on a summary of existing studies and empirical research, Ajzen (2002, p. 672) concluded that “perceived behavioral control is comprised of two components: self-efficacy (dealing largely with the ease or difficulty of performing a behavior) and controllability (the extent to which performance is up to the actor)”, Nevertheless, some scholars suggest that self-efficacy is a more powerful predictor of intention and self-efficacy has a direct impact on behavior (Cooke et al. 2016; Manstead & van Eekelen 1998; Povey, Conner, Sparks, James, & Shepherd 2000), while controllability items predicted intentions only when combined with self-efficacy items (e.g., for a review see Ajzen 2002). What's more, using this term PBC may have been misleading, because sometimes it has been taken to refer to the belief that performance of a behavior affords control over attainment of an outcome (Ajzen 1991), therefore, in order to be accurately express the construct and to better predict behavior, self-efficacy is used in this model. The higher self-efficacy one believes, the more active the efforts to take protective actions (Cooke et al. 2016). In the tourism context, many scholars have investigated that self-efficacy is important in predicting tourists' behaviours (Doran, Hanss, & Larsen 2015; Doran, Hanss, & Øgaard 2017; Lee & Lina Kim 2018). Hence, we propose the following hypothesis:

H1. There is a positive relationship between self-efficacy and preventative behaviour.

In the TPB, attitude is regarded as a construct leading to intentions and behaviour (Ajzen 1991). Attitude toward the behaviour refers to people's evaluations of performing a specific behaviour. The more positive attitude one holds, the more possible for them to perform the behaviour (Mcmillan & Conner 2003). In the tourism context, relationships are tested in diving, food consumption, and environmental conservation activities (Han 2015; Tahfatt & Musa 2011; Zhang, Li, Yang, & Zhang 2018). Thus, based on the TPB and previous studies, it was hypothesized that.

H2. There is a positive relationship in attitudes toward prevention and preventive behaviours.

Some researchers indicate that the subjective norm construct is usually shown to be a weak predictor of behaviour because it seems impossible that most people's behaviours are influenced by social pressures and interpersonal factors (Armitage & Conner 2001; Sparks, Shepherd, Wieringa, & Zimmermanns 1995). Travel to Tibet is a activity with relatively higher health risk and would symbolize the owners' personality (Cui, Xu, & Yang 2014). For tourist who planned to travel to Tibet, the consequences of health risk might be serious, in order to measure the consequences more appropriately, tourists generally spend more time in searching information before the trip. Therefore, tourists may not easy been influenced by social norm. Thus, we focus on the influences from personal risk beliefs, and the subjective norm is not included in the current model.

2.3.2. Health beliefs and preventative behaviours

In the HBM, perceived susceptibility can be interpreted as individuals' subjective feelings of personal vulnerability and probability to risk (Janz & Becker 1984). Some researchers indicate that the perceived threat positively correlates with healthy behaviour, and the perception of threats would encourage people to act to reduce their risk (Chew, Palmer, Slonska, & Subbiah 2002; Weinstein 2000). In the tourism context, if the perceived susceptibility of potential risks is higher, the more would people demand to engage in risk mitigation measures (Pligt 1996) and preventative behaviours (Chien et al. 2017). Thus, we hypothesize as follow:

H3. There is a positive relationship between perceived susceptibility and preventative behaviour.

Perceived severity always means feelings concerning the seriousness of illness or other potential outcomes (Janz & Becker 1984), which can lead to corresponding preventive actions. For example, an individual's perceived severity of illness and vulnerability toward complications heavily influenced the rates of medication self-behaviour; in other words, people will take action to prevent illness if they believe it would have potentially serious consequences (Champion & Skinner 2008). In leisure studies, Gristwood (2011) pointed out individual's perceived severity played an important role in predicting physical activity engagement and health behaviours in older adults. According to Laver,

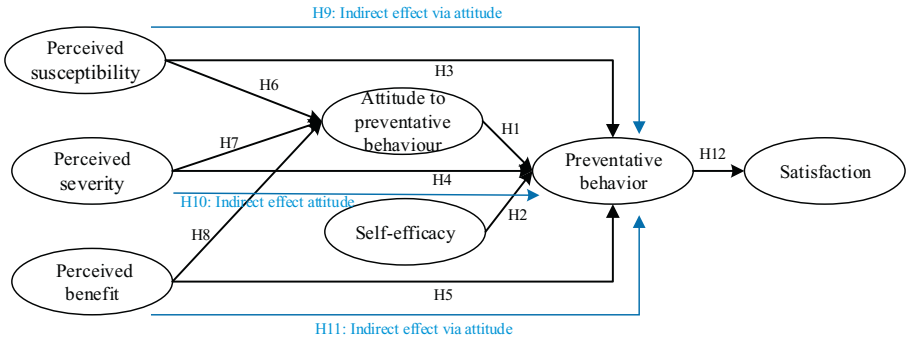

Fig. 1. Conceptual model.

Wetzels, and Behrens (2001), travelers to Zimbabwe, who had a higher perception of risk and perceived seriousness of malaria, were more likely to have undertaken precautions. Thus, we hypothesize:

H4. There is a positive relationship between perceived severity and preventative behaviour.

Perceived benefit is the perceived effectiveness of protective actions available in reducing risks (Janz & Becker 1984). Whether the preventative behaviour will be used is influenced by the perceived benefits of the preventative behaviour (Chen & Lin 2010; Rosenstock 2010), and there is a positive relationship between perceived benefits and health prevention behaviour (Li et al. 2015; Zak-Place & Stern 2004). In terms of physical activities, the more significant benefits and effectiveness of positive health behaviour people perceived, the more money they will spend on healthy items (Gristwood 2011). Thus, we propose the following hypothesis:

H5. There is a positive relationship between perceived benefit and preventative behaviour.

2.3.3. Health beliefs and attitudes

The TPB postulates that attitudes can be predicted by behavioral beliefs and evaluations, where beliefs are the likelihood and consequences from performing or not performing a certain behavior, and evaluations are assessments of whether these behavioral outcomes would be beneficial (Mcmillan & Conner 2003). Because perceived susceptibility and perceived severity are expectations of potential losses and risks, they would negatively influence attitudes toward the risk-induced behaviour but can positively induce a preventative behaviour (Quintal et al. 2010; Zhang et al. 2018). For example, those who believe they have a high possibility to suffer from risk or perceive the severity of risk will have a more positive attitude toward engaging in protective behaviours (Amuta, Jacobs, Barry, Popoola, & Crosslin 2016). Furthermore, perceived benefits are expectations of the preventative behavior, and, based on the expectancy-value model, attitudes are determined by the beliefs people hold about the object of the attitude (Ajzen 1991). Therefore, participants who believed that the specific behavior is safer and more effective will lead to having a positive attitude toward that action (Rogers 2010). Consequently, they are hypothesized:

H6. There is a positive relationship between perceived susceptibility and attitude toward preventative behaviour.

H7. There is a positive relationship between perceived severity and attitude toward preventative behaviour.

H8. There is a positive relationship between perceived benefit and attitude toward preventative behaviour.

Furthermore, Zhang et al. (2018) suggested that risk perceptions and benefit perceptions are related to individual food consumption behaviours indirectly via attitudes; thus, except for the direct relationship among perceived susceptibility/perceived severity/perceived benefit and attitude/preventative behaviour, we expect that the influence of tourists' health beliefs (perceived susceptibility/severity/benefit) on preventative behaviour can be mediated through attitudes toward this kind of behaviour.

Hypothesis 9. Attitude toward preventative behaviour mediates the relationship between the perceived susceptibility and preventative behaviour.

Hypothesis 10. Attitude toward preventative behaviour mediates the relationship between the perceived severity and preventative behaviour.

Hypothesis 11. Attitude toward preventative behaviour mediates the relationship between the perceived benefit and preventative behaviour.

2.3.4. Preventative behaviour and travelling satisfaction

Travelling satisfaction refers to a personal assessment of overall experience and it's a kind of state of mind. In the tourism context, previous research found that most travelers are likely to change their travel plans, if a destination has risks (Fuchs & Reichel 2011; Lepp, Gibson, & Lane 2011). Therefore, for most tourists, risk should be avoided because it negatively influences their experience. And the impact of tourists' risk preventative behaviour on travel satisfaction should be another focus of tourism research (Li, Pearce, et al. 2015). Lin, Lee, and Wang (2012) indicated that the more adequately undergraduates took action to overcome risk when they travelled overseas, the higher satisfaction they would obtain from their experience. Accordingly, the following hypothesis is proposed (Fig. 1).

H12. There is a positive relationship between tourists' risk prevention behaviour and travel satisfaction.

3. Methodology

3.1. Sampling and procedure

Tourists who were on their journey and already had some travel experiences during this trip, but not those who just arrived in Lhasa and didn't have much travel experience in Tibet were defined as the target study population. The number of foreign tourists in Tibet is relatively small. Thus, the target population in this study is domestic Chinese tourists. Data were collected in Lhasa, the capital city of Tibet, in August 2017. There are two reasons why we chose to send questionnaires in Lhasa: 1) Lhasa is the main destination for many tourists when travelling to Tibet, and it's often the last stop of their journey because travelling routes in Tibet are characterized by a radius pattern with Lasa in the center (Zhai 2008); 2) on-site research helps to obtain more accurate information because visitors can more clearly recall their pre-trip preparation and experience on the road.

We adopted a self-administered survey method. Surveyors

approached travelers at the exits of the Potala Palace or in the Palace Square. Sampling was adapted in the way that every tourist had an equal chance of being selected. The researcher remained in the same location, and the first person and each following person encountered were invited to participate (Holladay & Powell 2013). Then, screening questions were asked (i.e., if it's the last stop of their journey or if they have been to other destinations in Tibet during this journey). Those who met the requirements and were willing to participate in the survey were asked to recall their tourism experiences in Tibet and to answer the survey questions.

3.2. Measurement

Based on previous tourist health research (Chien et al. 2017; Page 2009), the situation in Tibet (Mu & Nepal 2016; Musa et al. 2004) and the experience of the researchers who have visited Tibet several times, three main risks were identified, i.e., diarrhea, altitude sickness, and catching a cold, which have high likelihood and are relatively minor health risks. The questionnaire was developed by literature review, tourist interviews, expert opinions and back-translation method. Since the survey was administered in Chinese, authors who were proficient in both Chinese and English translated the original items into Chinese and tried to detect any ambiguities as well as to confirm that the translated versions reflected the meanings and intent of the original questionnaire (Zhu, Lyu, Deng, & Ye 2017).

Perceived susceptibility was measured by the person's estimate of the likelihood of potential risks occurring when travelling in Tibet, and perceived severity was interpreted as the individual's view of the potential impact of these risks on a five-point Likert-type scale. The scale includes items “Before arriving at Tibet, I think I will be likely to get [insert risk]” and “Before arriving at Tibet, I believe that the outcome of getting [insert risk] will be severe” (Becker, Kaback, Rosenstock, & Ruth 1975; Jones et al. 2015). The level of perceived benefits was assessed with 5-point Likert scales, reflecting the perception of effectiveness of preventative behaviour to avoid the risks, which was measured by “Taking preventative behaviours can be effective to avoid [insert risk]” (Li, Yang, et al. 2015). Both self-efficacy and preventative behaviour were measured using items adopted from Freimuth and Hovick (2012, p. 308). Specifically, self-efficacy was measured with the item, “How confident are you that you can do what is needed to lower your risk of [insert risk]?” on a 5-point Likert-type scale ranging from 1 (not all confident) to 5 (very confident) for three different risks. Further, preventative health behavior was used a single item asking how respondents were protecting themselves from the three kinds of risks on a 5-point Likert-type, scale ranging from 1 (I am doing nothing to protect myself) to 5 (I am doing the most I can to protect myself). Attitude toward preventative behavior was measured by a 5-point Likert-type scale, using the adjectives (wise, beneficial, and good), following the statement, “taking preventative behavior before travelling to Tibet would be …” (Schomerus, Matschinger, & Angermeyer 2009). Overall satisfaction was measured using four items that were adapted from Li, Pearce, et al. 2015, p. 50): “I am satisfied with this travel experience”; “I feel that this tourism experience is enjoyable”; “I think this travel decision is wise”; and “I feel this travel experience is in line with my expectations.” The questionnaire which includes both Chinese and English version is available as Appendix A.

4. Result

4.1. Sample profile

A total of 350 questionnaires was distributed, of which 281 were valid. The response rate is 80%, with 32.6% group tourists. The number of males and females participating in the survey is basically the same (50.5% vs. 49.5%). Respondents came from different age groups, with most respondents (62.7%) ranging in age from 18 to 34 years. Most respondents came from Guangdong Province (13.8%), followed by Jiangsu (7%), Zhejiang (6%), Shanxi (5.9%), and Liaoning (5.9%). Approximately 55.5% of respondents had completed a university degree. > 64.5% had a monthly income of over $700.

4.2. Measurement model

The structural equation modelling (SEM) was adopted for path analysis and model analysis. Before SEM was conducted, the appropriateness of the data was examined. First, all the missing values are filled with sequence mean. Then, a Shapiro–Wilk test was conducted with SPSS (Version 24) to assess the normality. The result reported significant p-values for variables ($p < .001$), suggesting that the data distribution is non-normal (Kim 2017). Therefore, the weighted least-squares mean- and variance-adjusted (WLSMV) estimator for categorical variables might be a better choice (Muthén 1984). WLSMV estimation is suitable for estimating non-normal data and more suited to the ordered-categorical nature of Likert scales (Beauducel & Herzberg 2006; Finney & DiStefano 2006). Descriptive statistics of the main items are represented by Fig. A1 (see Appendix B).

According to Anderson and Gerbing (1988), the reliability, convergent validity, and discriminant validity of constructs should be tested before the SEM. Because Cronbach's α is the important indicator of examining the reliability of scale, as reported in Table 3, the Cronbach's α coefficient ranged from 0.779 to 0.929, indicating an acceptable internal consistency of the scale items (Chien et al. 2017). Then, the convergent and discriminant validity of the seven constructs were examined by comparing different alternative plausible models. As shown in Table 1, the results indicated that the seven-factor model provided a better fit to the data ($X2(188) = 366.841$, $p < .01$; CFI = 0.987; TLI = 0.983; RMSEA = 0.058) (Cheung & Rensvold 2002; Zhu et al. 2017).

In order to further assess the convergent and discriminant validity of the key constructs in the seven-factor model, the confirmatory factor analysis (CFA) was conducted by Mplus (Version 7.4) with WLSMV estimation (Brown 2015; Zhu et al. 2017). As shown in Table 2, the

Table 1
Results of the confirmatory factor analysis for the measures of the variables studied.

Model	X^2	Df	RMSEA	CFI	TLI
The baseline model (seven-factor model)	366.841	188	0.058	0.987	0.983
Six-factor model: perceived susceptibility and perceived severity were combined into one factor	507.686	194	0.076	0.976	0.972
Five-factor model: perceived susceptibility, perceived severity and perceived benefit were combined into one factor	1565.199	199	0.156	0.897	0.880
Four-factor model: perceived susceptibility, perceived severity, perceived benefit and self-efficacy were combined into one factor	1722.453	203	0.163	0.885	0.870
Three-factor model: perceived susceptibility, perceived severity, perceived benefit, self-efficacy and attitude were combined into one factor	2767.998	206	0.210	0.807	0.783
Two-factor model: perceived susceptibility, perceived severity, perceived benefit, self-efficacy, attitude and preventative behavior were combined into one factor	2771.526	208	0.209	0.807	0.785
One-factor model: all variables were combined into one factor	4167.259	209	0.260	0.701	0.670

Note: N = 281; TLI is the Tucker-Lewis index; CFI the comparative fit index; and RMSEA the root-mean-square error of approximation.

Table 2
Descriptive statistics and confirmatory factor analysis results of the seven-factor model.

Factors and items (Cronbach's alphas)	M	SD	Standardized factor loading	p-Value	Composite reliabilities	AVE
Perceived susceptibility (0.779)					0.809	0.586
PSU1	3.56	0.932	0.720	< 0.001		
PSU2	4.16	0.898	0.812	< 0.001		
PSU3	3.87	0.928	0.761	< 0.001		
Perceived severity (0.824)					0.865	0.682
PSE1	2.69	0.952	0.731	< 0.001		
PSE2	3.29	1.028	0.908	< 0.001		
PSE3	3.01	1.014	0.829	< 0.001		
Perceived benefit (0.825)					0.876	0.701
PBE1	3.69	0.708	0.835	< 0.001		
PBE2	3.53	0.845	0.825	< 0.001		
PBE3	3.65	0.756	0.852	< 0.001		
Attitude (0.931)					0.963	0.897
AT1	4.36	0.672	0.916	< 0.001		
AT2	4.40	0.631	0.992	< 0.001		
AT3	4.36	0.668	0.931	< 0.001		
Self-efficacy (0.790)					0.833	0.626
SE1	3.44	0.848	0.747	< 0.001		
SE2	3.10	0.994	0.782	< 0.001		
SE3	3.35	0.918	0.841	< 0.001		
Preventative behaviour (0.883)					0.916	0.785
PB1	3.53	0.989	0.861	< 0.001		
PB2	3.74	0.966	0.885	< 0.001		
PB3	3.70	0.973	0.912	< 0.001		
Satisfaction (0.929)					0.962	0.864
S1	4.23	0.764	0.922	< 0.001		
S2	4.25	0.770	0.949	< 0.001		
S3	4.14	0.805	0.944	< 0.001		
S4	4.25	0.747	0.903	< 0.001		

Note: $N = 281$. PSU = perceived susceptibility; PSE = perceived severity; PBE = perceived benefit; AT = attitude to preventative behavior; SE = self-efficacy; PB = preventative behavior; S = satisfaction.

composite reliabilities were 0.70 or above (ranging from 0.809 to 0.962), indicating adequate internal validity and consistency for each construct in the model (Hair, Anderson, Tatham, & Black 1995). Furthermore, the average variance extracted (AVE) values of the seven constructs were greater than the 0.50, and the composite reliabilities were > 0.60, suggesting that the model has good convergent validity (Bacon, Sauer, & Young 1995; Fornell & Larcker 1981).

The discriminant validity of the measurement model was tested by comparing the AVE values to the squared correlations between the corresponding constructs ((Fornell & Larcker 1981). As shown in Table 3, all of the AVEs were greater than the squared correlations of the paired constructs, indicating that the model has good discriminant validity (Kim 2017).

4.3. Structural model and hypothesis testing

Achieving confidence in the good fit of all the measurement models and their factorial structure, the structural equation path was designed in Mplus 7.4. To estimate the single-item measures, we followed the work of Seibert, Kraimer, and Liden (2001) to set the measurement path as one and assume no error. In addition, we followed the Cortina, Chen, and Dunlap (2001) approach to set the error and measurement path of interaction. Results of the structural model indicated that the hypothesized model fit the data well ($X2(194) = 449.520$; $p < .001$; CFI = 0.981; TLI = 0.977; RMSEA = 0.068).

Fig. 2 and Table 4 provide a summary of the SEM and the results of the examinations of research hypotheses. The R2 values indicate the explanatory power of the variable(s) on each construct. Perceived susceptibility, perceived benefit, attitude, and self-efficacy explained 38.0% of the variance in preventative behaviour (R2 = 0.380). Perceived susceptibility and perceived benefit explained 28.5% of the variance in attitude (R2 = 0.285), while preventative behaviour only predicted 6.8% of satisfaction (R2 = 0.068). Referring to Chin, Peterson, and Brown's (2008) classification of the R2 values, the

Table 3
Construct Intercorrelations.

Variables	PSU	PSE	PBE	AT	SE	PB	S	Mean	Std.
PSU	0.77[a]							3.86	0.766
PSE	0.473**	0.83[a]						3.00	0.860
PBE	−0.064	−0.138*	0.84[a]					3.62	0.663
AT	0.339**	0.147*	0.294**	0.95[a]				4.27	0.590
SE	−0.147*	−0.187**	0.514**	0.178**	0.79[a]			3.30	0.773
PB	0.254**	0.112	0.283**	0.377**	0.263**	0.89[a]		3.66	0.878
S	−0.015	−0.154**	0.139*	0.227**	0.158**	0.081***	0.93[a]	4.28	0.713

Notes: $N = 281$ PSU = perceived susceptibility; PSE = perceived severity; PBE = perceived benefit; AT = attitude to preventative behavior; SE = self-efficacy; PB = preventative behavior; S = satisfaction.

*** $p < 0.001$.

** $p < 0.01$.

* $p < 0.05$.

[a] Square root of average variance extracted.

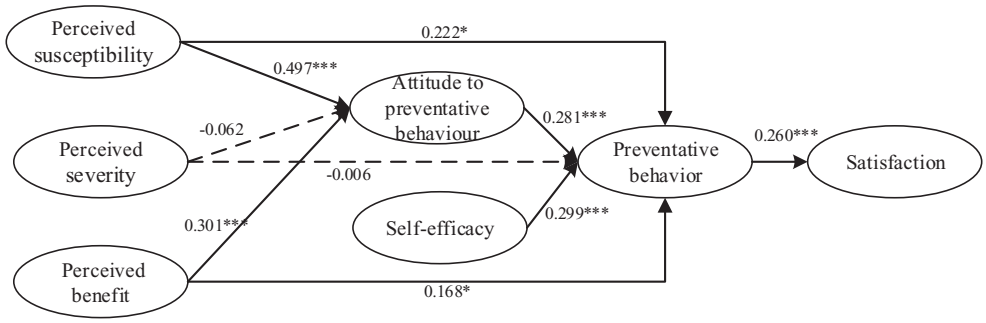

Fig. 2. Results of the structural model.
Notes: N = 281; *** p < .001, ** p < .01, * p < .05.

Table 4
Summary of the structural model results.

Hypothesis	Paths	Coefficient	Standard Error	p-Value	Results
H1	AT→PB	0.281	0.075	0.000	Supported
H2	SE → PB	0.299	0.082	0.000	Supported
H3	PSU → PB	0.222	0.094	0.017	Supported
H4	PSE → PB	−0.006	0.077	0.937	Unsupported
H5	PBE → PB	0.168	0.077	0.030	Supported
H6	PSU → AT	0.497	0.086	0.000	Supported
H7	PSE → AT	−0.062	0.097	0.521	Unsupported
H8	PBE → AT	0.301	0.058	0.000	Supported
H9	PB → S	0.260	0.060	0.000	Supported

Notes: N = 281. PSU = perceived susceptibility; PSE = perceived severity; PBE = perceived benefit; AT = attitude to preventative behavior; SE = self-efficacy; PB = preventative behavior; S = satisfaction.

Table 5
Bayes results to test the significance of mediation effect (indirect effects).

Total indirect paths/effects	Mediating variable	β	PosteriorS.D.	p-Value	95% Confidence interval	
					Lower 2.5%	Uper 2.5%
PSU → PB	ATT	0.088	0.040	0.011	0.016	0.175
PSE → PB	ATT	−0.010	0.020	0.248	−0.057	0.022
PBE → PB	ATT	0.057	0.028	0.011	0.011	0.118

Notes: N = 281. PSU = perceived susceptibility; PSE = perceived severity; PBE = perceived benefit; PB = preventative behavior; AT = attitude to preventative behavior.

explanatory power of health beliefs and attitudes toward preventative behavior and health beliefs on attitude can be described as moderate, while the explanatory power of protective behavior on satisfaction was very weak.

As Table 4 shows, seven of the nine hypotheses were supported, while H4 and H7 were not empirically supported. In support of H1 and H2, attitude and self-efficacy positively correlated with preventative behavior, which is coincident with the TPB, suggesting that if one holds a positive attitude toward preventative behavior or believes he or she is confident in taking preventive actions, that person will be more likely to perform the protective behavior. Perceived susceptibility and perceived benefit positively influenced preventative behavior, supporting H4 and H5. The result suggests that a high level of perceived susceptibility or perceived benefit will induce preventative behavior. Also, perceived susceptibility and perceived benefit have a positive relationship with attitude, respectively, supporting H6 and H8. Further, a larger β value for the causal path from perceived susceptibility to preventative behavior (β = 0.0.497; p < .001) than for the path from perceived benefit (β = 0.301; p < .001) indicated that perceived susceptibility is more influential than perceived benefit in predicting attitude to preventative behavior. However, perceived severity did not influence attitude (β = −0.062; p = .521) and preventative behavior (β = −0.006; p = .937), which did not support H4 and H7. Furthermore, preventative behavior was positively related to satisfaction (β = −0.260; p < .001), which supported H12.

In addition, this study employed the Bayes estimator to investigate the mediation effect of attitude in the structural model and found that attitude toward preventative behaviour mediated the effect of perceived susceptibility and perceived benefit of risk prevention behaviour. Specifically, attitude mediated the impact of perceived susceptibility on preventative behaviour and perceived benefit on preventative behaviour (supporting H9 and H11), while there is no significant relationship between perceived severity and preventative behaviour, which did not support H10 (Table 5). This result reveals that the belief-attitude-behaviour relationship proposed in TPB model is partially supported by our study (Chien et al. 2017). This result also suggests that the influences of differing risk beliefs on attitude and behaviour are discrepant.

5. Conclusion and implications

5.1. Conclusion

Health beliefs can significantly influence tourists' prevention behaviours and their experiences, as shown in this study. By integrating TPB and HBM, this study investigated relationships among health beliefs and attitudes, self-efficacy, and, preventative behaviour as well as their satisfaction of being tourists in Tibet.

As expected, both attitude and self-efficacy were positive predictors of preventative behavior (Hypotheses 1 and 2). If tourists have a more positive attitude on protective measures, they will be more likely to perform the preventative behavior. This is consistent with previous studies (Chen & Land 1986; Chen & Lin 2010; Quintal et al. 2010). Furthermore, the significant relationship between self-efficacy and behavior also confirms the previous studies that self-efficacy is powerful to predict behavior (Zak-Place & Stern 2004).

Perceived susceptibility has a positive direct effect on preventative behavior (Hypothesis 3), which is consistent with the HBM. In other words, a higher perceived susceptibility of risk encourages tourists to take action to reduce risks (Chien et al. 2017; Laver et al. 2001). Moreover, perceived benefit is positively associated with preventative behavior (Hypothesis 5), indicating that, if one believes in the effectiveness and benefits of preventative actions to reduce risks, she/he is more inclined to do so (Smith et al. 2016).

The study has made a few theoretical contributions. The most significant is the development of an integrated model based on TPB and HBM to examine the relationship between health beliefs and attitudes in regard to preventative behavior. As expected, perceived susceptibility and perceived benefit positively predict attitudes toward preventative behavior (Hypotheses 6 and 8), which validated that health

beliefs originating from the HBM are also important indicators of the attitudes described in the TPB. Also, the indirect effects of health beliefs on preventative behavior via the mediating effects of attitude toward preventative behavior are recognized in this study (Hypotheses 9 and 11). Thus, the current study provides a comprehensive view toward understanding the relationships among health beliefs, attitude, self-efficacy, and preventative behaviours. In general, the TPB was supported and extended by the health belief factors from HBM, which conceptualizing a comprehensive model of risk perception and also provide a developmental perspective on a fundamental component of HBM and TPB.

Furthermore, there was a significant relationship between preventative behaviours and satisfaction (Hypothesis 12). If tourists take adequate precautions, they are less likely to encounter actual dangers and feel more secure, which typically leads to relatively high travel experience and satisfaction. Risk is associated with tourist experience and tourists typically wish to avoid it (Bowen & Clarke 2002). Thus, preventative behavior can produce a positive affective response and create overall satisfaction (Chang & Beise-Zee 2013). Previous studies have demonstrated that destination image (including health and safety issues) perceived by tourists during their trip positively influences tourists' overall satisfaction and suggested that destinations should take measures to improve destination image (Kim 2017). However, for destinations with health risks caused by natural factor (e.g., high altitude and cold environment), it's nearly impossible for destination to change the environment, so what can these destinations do to improve travelers' satisfaction? According to our findings, for destinations where there are risks that cannot be eliminated, but where tourists can take measures to prevent them, encouraging visitors to take sufficient preventive behaviour is important to increase their travelling satisfaction, therefore, destinations should include tourists as the active actors in this process.

Last but not least, despite the wide acceptance that the more perceived risk severity would induce a more positive attitude toward prevention and more adequate preventative behavior, this study does not support these linkages (Hypotheses 4 and 7). This finding is also supported by studies that perceived severity had relatively lower predictive power on preventative behavior as compared with the other variables (Chen & Land 1986; Hubbell 2006; Janz & Becker 1984). This may be related to the types of risks and the special geographic and climatic conditions noted in this article. Further, the risks measured here are diarrhea, altitude sickness, and catching cold, which are common in high-altitude destinations. It is possible that these health risks are not serious enough to motivate individuals into action. Yet, it's also possible that many tourists are too confident about their physical fitness and underestimate the impact of health risk in Tibet, in this situation, improving travelers' health risk perception in Tibet and encouraging them to take preventive behaviour are quite necessary.

5.2. Implications and limitations

The results of this study should provide practical implications. Although these health risks are less dangerous for most people, they can cause physical discomfort and affect the travel experience, and sometimes they are life-threatening for some visitors if there is no prevention. Thus, it's necessary for tourists to improve their health beliefs and take effective preventive behaviour before they travel to Tibet. Based on this study, travelling agencies, public health officials and destination marketers should provide rich health information and risk education to visitors.

This study confirms that perceived susceptibility is an important factor in predicting attitude and preventative behaviour because those who perceived themselves to be at greater risk may believe that engaging in preventative behaviour is wise, and they will attempt to change risky behaviour and take protective actions (Wilder-Smith, Khairullah, Song, Chen, & Torresi 2004). Thus, for destination managers in Tibet, it is necessary to increase the level of risk perception among potential travelers. For example, destination management should inform tourists who are susceptible to high-altitude diseases, the likelihood and symptoms of these diseases through public announcement ads or education materials. According to Hackett and Shlim (2018) “the high-altitude environment exposes travelers to cold, low humidity, increased ultraviolet radiation, and decreased air pressure, all of which can cause problems”. Inadequate acclimatization may lead to altitude illness. Especially for those who with medical conditions (heart failure, angina, sickle cell disease, etc.), they should consult a physician familiar with high-altitude medical issues before undertaking high-altitude travel. Therefore, tourists should improve their understanding of Tibet's special climatic and geographical conditions and the early symptoms of altitude illness, and be willing to acknowledge these illnesses when they are present, which would lead to higher levels of positive attitude and preventative behaviours (Chien et al. 2017).

In addition, perceived benefit was also found to be important in forming positive attitudes and desire to take preventative actions (Gristwood 2011). Thus, it is important for destination marketers in Tibet to convince visitors that risk prevention measures in regard to altitude sickness are safe, helpful and effective. Travelers should also realize that, although they maybe not able to eliminate the possibility of illness, they are capable of preventing serious consequences and reducing damage (Doran et al. 2015; Doran et al. 2017).

Furthermore, the current study also provides evidence that self-efficacy is positively related to risk prevention behaviour. Owing to the importance of self-efficacy, travel agencies targeting the Tibetan market or local management departments should communicate the ease of undertaking preventative behaviours, making visitors believe that they are able to take preventive measures to prevent risks effectively. As the Centers for Disease Control and Prevention (CDC) pointed out, “since the onset of symptoms and the clinical course of these high illness are sufficiently slow and predictable, there is no reason for anyone to die from altitude illness, unless trapped by weather or geography in a situation in which descent is impossible”.

For health professionals and experts, they would inform tourists that there are a lot of easy and effective protective behaviours that tourists are able to do to prevent these sicknesses. For example, taking or preparing appropriate drugs in advance is one of the most guaranteed ways to prevention (e.g., antibiotics for travelers' diarrhea). It's also very useful to bring oxygen suppliers to prevent altitude illness in Tibet. One of the effective ways to prevent colds is to prepare warm clothing (e.g., a tightly woven, preferably wind-resistant coat or jacket; inner layers of light, warm clothing; mittens; hats; and scarves.) when travel to Tibet. In general, more public announcement ads or education materials is need to deliver to tourists to enhance their awareness of the necessity and importance of taking preventive actions, and also to increase tourists' positive attitude and intention of engaging in preventative behavior.

The present research is not without its limitations. Although the sample was representative based on tourists who are on a journey, those who suffered severe consequences may not be included. Also, in current research, the main focus is the relationships among health belief, preventative behavior and satisfaction, indicators for perception of barriers, cues of actions in the HBM model and subjective norms, and behaviour intentions in the TPB model are not considered in this model. Whether there are causal relationships between the belief of barriers and attitude/preventative behaviour or subjective norms and attitude toward preventative behaviour is not known. Future research should address these limitations and build a more comprehensive model to analyse tourists' risk prevention behaviours and travel behaviours. Finally, while this integrated model of risk assessment and risk experience is developed in the tourism context and tested in Tibet, only three risks are considered in our model. The risks that may occur in tourist destinations are various. This research mainly focused on the mild disease risks. The analysis of different types of diseases may give

more comprehensively understanding for the disease prevention behavior of tourists. Tibet is also a special tourist destination, tourists' disease prevention behavior should be tested in other destinations and contexts to enhance its applicability.

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Declaration of Competing Interest

None.

Appendix A. Supplementary data

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