



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Full length article

The psychology of cruise service usage post COVID-19: Health management and policy implications

Kum Fai Yuen^a, Yangyi Cao^a, Xiwen Bai^b, Xueqin Wang^{c,*}^a School of Civil and Environmental Engineering, Nanyang Technological University, Singapore^b Department of Industrial Engineering, Tsinghua University, Beijing, China^c Department of International Logistics, Chung-Ang University, Republic of Korea

ARTICLE INFO

Keywords:

Health belief model
Trust
COVID-19
Cruise
Public health
Psychology

ABSTRACT

The cruise industry has suffered a huge loss due to the suspension of cruise operations during the COVID-19 pandemic. As the industry is preparing for recovery, there is an urgent need for research on cruise consumers' psychology, in particular, the factors influencing their intention to use cruise services after the pandemic. This study employs theories, namely, the health belief model, trust theory and attitude theory, to investigate consumers' use intention for cruise services after the pandemic. An online survey was administered to consumers in China's tourism industry, where 376 responses were received. Subsequently, this study employs structural equation modelling to test its theoretical model consisting of hypotheses. The results show that consumers' trust is directly influenced by health belief constructs including perceived safety threat, outcome expectation, self-efficacy and cues to action. Next, trust exerts a direct impact on consumers' attitude and intention to use cruise services. Moreover, this study finds full and partial mediation effects. The findings provide a series of recommendations for cruise operators and policymakers in terms of marketing strategies, service design, public communication and health measures.

1. Introduction

In 2020, the unanticipated outbreak of COVID-19 pandemic has harmed the maritime industry, especially the cruise sector. The travel restrictions implemented by nearly two-thirds of countries worldwide had caused a significant decline in the number of international cruise travellers [1]. For example, the United States introduced the No Sail Order to prohibit any cruise tour in its jurisdiction from March to October 2020 [2]. In addition, the members of Cruise Lines International Association (CLIA) have voluntarily paused cruise sailings since mid-March 2020 to curb the spread of the virus. The halt of cruise services consequently brings a tremendous loss to cruise operators. According to Norwegian Cruise Line [3] – the world's third-largest cruise company – the revenue in the second quarter of 2020 has slumped by 99% compared to 2019. In addition to the loss of income, the fleet in suspension can incur huge layup cost. Consequently, cruise companies, such as Carnival Cruise Line, are selling ships to make up for financial loss. Globally, the pandemic has caused 77 billion USD economic loss and unemployment of 518,000 people [4].

Within the shipping industry, the cruise is extremely vulnerable to

health crises. Contagious diseases could easily spread among people aboard due to the enclosed compartments of cruise ships and high population density [5]. The most well-known case is the outbreak on the Princess Diamond in February 2020, where more than 700 of 3711 passengers and crew members contracted the coronavirus [6]. Apart from the Princess Diamond, at least 25 cruise ships reported cases of COVID-19. Moreover, the spread of infection can be faster without quarantine measures as many people on board touched the contaminated surfaces of common facilities. In addition, the manifestation of COVID-19 makes it more challenging to control the spread of the virus. Infected people may remain asymptomatic but contagious, causing additional difficulty with timely detection and isolation [2]. High vulnerability of cruise may reduce customers' intention to use cruise services in fear of acquiring the virus, which will potentially undermine the profitability of cruise companies. Furthermore, COVID-19 has a permanent effect on consumers' evaluation of using cruise services, affecting their future intention [7]. Therefore, studies on the effect of consumers' concern for the outbreak on their intention to use cruise services are necessary.

Previously, studies on consumers' use intention for cruise services

* Corresponding author.

E-mail address: xueqinwang@cau.ac.kr (X. Wang).

have mainly focused on marketing, which employs proactive and reactive approaches. Proactive marketing involves spontaneous decisions to enhance customer satisfaction and loyalty by improving the service quality. For example, Calza et al. [8] discovered that the onboard environment quality, such as the ambience, aesthetics and social factors, can affect customer satisfaction, thereby influencing consumers' behavioural intention to use cruise services. In addition, Wu et al. [9] identified three other aspects of service quality, namely, interaction, outcome and access quality, which influence consumers' cruise travel intention via experiential satisfaction. In contrast, reactive marketing refers to companies' countermeasures against negative events, such as crisis management and service recovery. For example, Liu et al. [10] proposed that cruise lines' crisis communication enhances consumers' self-efficacy, which will increase their intention to use cruise services in health-threatening situations. Moreover, service recovery can positively moderate the impact of service quality on people's future travel intention [11].

Although studies before COVID-19 are concentrated on the marketing aspect of the cruise industry, research addressing consumers' health and safety psychological concerns, which impact their use intention for cruise services, is limited. The recent health-related studies only explained the rationale behind health protection behaviours (e.g. dining or handwashing intention) on cruise ships, but not their intention to use cruise services [12,13]. An exception is the research by Holland et al. [7] who specified the negative impact of COVID-19 on Australian consumers' future cruising intention. However, they did not explain how the impact is formed. Therefore, this study extends existing marketing research by incorporating health theories to study the impact of COVID-19 outbreaks on consumers' intention to use cruise services. Specifically, this study introduces the health belief model (HBM) to identify and capture the underlying psychological factors that result in such intention. The HBM proposes that consumers' use intention for cruise services can be regarded as a form of protection motivation behaviour. For example, consumers' avoidance of using cruise services is a way to protect themselves from contracting a disease.

Apart from consumers' health beliefs, trust and attitude are crucial to their usage intention, especially during and after a health crisis [14–16]. These two elements are pivotal during the recovery from an outbreak as they not only help rebuild the image of cruise services but also strengthen companies' capability of recovering from disasters [17,18]. Hence, this present study aims to identify and examine psychological factors that affect consumers' intention to use cruise services after COVID-19 by building on a comprehensive framework including the HBM, trust theory and attitude theory. The World Health Organization [19] defined 'post-pandemic' as the time when people across all age groups gain some immunity to the disease worldwide, but outbreaks due to the virus will continue to occur. In this research, post-COVID-19 refers to the time when travel restrictions are lifted by most of the world.

The rest of this study is organised as follows. Firstly, guided by the aforementioned theories, this study builds a model that justifies how health beliefs, trust and attitude of cruise consumers affect their intention to use cruise services. Secondly, it introduces the survey design and data analytical approaches. Thirdly, it presents the results of each hypothesis. Lastly, it explains the implications and limitations of this study and recommends directions for future research.

2. Literature review

2.1. Theories and models

This study adopts three psychological theories to investigate how consumers' use intention for cruise services is influenced by their health beliefs, trust and attitude. The basic assumptions, key constructs and application of each theory are summarised in Table 1.

Fig. 1 presents the theoretical model. It describes the interrelationships among the constructs and their impacts on consumers' intention to

Table 1
Theories explaining consumers' intention to use cruise services.

| Theory's characteristics | Health belief model | Trust theory | Attitude theory |
|--------------------------|---|--|--|
| Paradigm | Psychology | Psychology | Psychology |
| Basic assumption | The intention to perform health protection behaviour are influenced by HBM constructs. | The positive expected performance of the service provider (e.g. cruise operator) under persistent perceived risk influences consumers' intention to use the service. | Positive cognitive and affective evaluation of cruise services can result in the formation of intention. |
| Key constructs | Perceived safety threat, outcome expectation, self-efficacy and cues to action | Trust | Attitude |
| Application to model | The theory can illustrate how its key constructs build consumers' trust in using cruise services. | The theory can explain how consumers' trust in cruise services leads to their intention. | The theory can support how trust influences consumers' attitude towards cruise services and subsequently, their intention. |

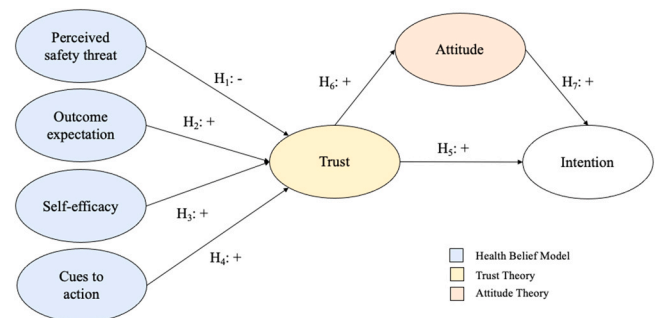


Fig. 1. The theoretical model.

use cruise services.

The four constructs of the HBM are shown in Fig. 1. They influence consumers' trust in the safety and reliability of cruise operators. HBM is commonly adopted to study the rationale of people taking health precautions, such as adopting a healthy diet and undergoing health screening tests [20,21]. In this study's context, cruise travelling involves performing a risk-taking behaviour as consumers might contract the virus onboard. Consequently, people who refrain from using cruise services are deemed to be taking health precautions. Therefore, HBM can logically explain consumers' use intention for cruise services.

To enhance the explanatory power of HBM, researchers usually ameliorate their models with a few more constructs relevant to the topic [22]. The current study proposes trust as the construct mediating the effects of the health belief constructs on consumers' intention to use cruise services. Trust is defined as consumers' confidence in cruise operators' ability to manage an outbreak onboard. When consumers use cruise services, they entrust on the operator who undertakes the responsibility of minimising or eliminating health risk. Trust is formed when consumers perceive more benefits than risk from using cruise services, which can be influenced by the four components of HBM [23]. Firstly, consumers who perceive a lower threat of the virus consider using cruise services less risky. Secondly, people who expect more benefits from cruise services possess positive appraisal of outcome expectation, which leads to a higher level of trust. Thirdly, self-efficacy

will strengthen their confidence in performing health protective behaviours onboard ships, hence assuming a lower risk. Lastly, cues to action can influence consumers' perception of benefit and risk. For example, comments from significant referents describing their positive experiences can reassure consumers about the cruise's safety. Therefore, H₁ to H₄ are proposed accordingly.

Based on trust theory, this study proposes the direct impact of trust on consumers' intention to use cruise services after COVID-19. Consumers' trust is formed when their perceived benefit is higher than their perceived risk [23]. Trust engenders consumers' confidence about the cruise operator, which allows them to accept the vulnerability in exchange for services provided by the trusted cruise operator [24]. Hence, a rational consumer who trusts a service operator would expect to obtain more benefits and lower risk from using a service, leading to the intention to use cruise services.

Finally, this study proposes the indirect effect of trust on consumers' use intention for cruise services via attitude. Attitude is defined as individuals' evaluation of a behaviour, which can be either positive or negative [15]. It comprises cognitive and affective appraisals of a service, reflecting people's thoughts and feelings about the service [25]. The attitude theory posits that attitude is a prominent determinant of consumers' intention to travel after COVID-19 [26]. In addition, it is also recognised as a direct predictor of people's acceptance of risk-averse tourism [27,28]. Hence, consumers' trust implies a positive attitude towards the cruise operator (H₆), leading to a stronger intention of using cruise services provided by that operator (H₇).

2.2. Antecedents of consumers' trust in cruise services

Previous studies have identified several factors that influence consumers' trust in cruise services. For example, a few studies [9,29] have pointed out a direct impact of customer satisfaction and perceived service quality on consumers' trust in a cruise operator. In addition to the cruise industry, trust in service providers is related to customers' prior experience, evaluation of cost and benefit, personality and perceived performance of service providers [30].

The aforementioned determinants mainly focus on customers' expectation and perception of the outcome of trusting the service provider. However, their health concerns are not addressed by these determinants, which could have a significant impact on consumers' trust in service providers considering COVID-19. Therefore, HBM is proposed to be more comprehensive because it reflects four dimensions explaining the formation of trust in cruise services from the health perspective [31]. Arguably, these dimensions either increase the benefits or reduce the risk when using cruise services, which can boost consumers' confidence or trust in a cruise operator.

2.2.1. Perceived safety threat on consumers' trust in cruise services

In the context of post COVID-19, perceived safety threat is defined as consumers' appraisal of the adverse results of using cruise services, which can be further divided into perceived susceptibility and perceived severity [32]. Perceived susceptibility reflects an individual's evaluation of the potential risk of cruise travelling, whereas perceived severity refers to the degree of seriousness a person thinks the consequences of risk could be.

Consumers evaluate the susceptibility and severity of an outbreak onboard based on health (e.g. susceptible population and long-term effects of disease) and economic concerns (e.g. medical expenses and loss of income). For example, individuals aged above 70 years are more susceptible and likely to show clinical symptoms than those under 20 years [33]. In addition, people severely infected by COVID-19 will be hospitalised, thus incurring medical costs and losing the ability to work. The high perceived safety threat indicates a higher likelihood or more severe consequence of being infected or suffering from potential financial losses, which present a greater risk to consumers. This harms consumers' trust in cruise services. Accordingly, the following hypothesis is

proposed.

H₁. *Perceived safety threat of cruise services has a negative impact on consumers' trust in cruise services.*

2.2.2. Outcome expectation on consumers' trust in cruise services

Outcome expectation is defined as consumers' perceived benefits minus perceived barriers of using cruise services. The expected outcome is positive when the perceived benefits are greater than the perceived barriers. Consequently, when consumers perceive positive outcome than risk, they are likely to establish trust in cruise services [25].

Perceived benefits are the values, for example, hedonic, utilitarian, economic and social benefits, consumers expect to gain from taking a cruise tour [23]. These benefits collectively incentivise people to use cruise services after COVID-19. Firstly, hedonic benefit is defined as the emotional satisfaction that passengers acquire from a cruise tour [34]. It is perceived when consumers expect a pleasant and enjoyable experience when booking cruise vacations. Secondly, utilitarian benefit refers to the functional values that can be realised using cruise services, such as travelling, dining and shopping [35]. Thirdly, consumers perceive economic benefit when they consider the services worthwhile compared to the price they paid. Lastly, consumers can obtain social benefit from using cruise services with their family and friends, where consumers' social connection with other individuals is enhanced.

Meanwhile, perceived barriers refer to individuals' evaluation of the cost and difficulty of performing health precautions [22]. For example, consumers must undergo swab tests before boarding and wear masks during the voyage. Once an outbreak occurs onboard, consumers must pay the additional price for quarantine or medical treatment. Thus, the regulations and safety measures after COVID-19 will incur additional cost and effort for people to comply with.

When consumers' perceived benefits exceed perceived barriers, they form a positive outcome expectation from using cruise services. Assuming that risk remains constant, positive outcomes can incentivise consumers to trust the cruise operator. Therefore, this study proposes the positive influence of outcome expectation on consumers' trust in cruise services after COVID-19.

H₂. *Outcome expectation has a positive impact on consumers' trust in cruise services.*

2.2.3. Self-efficacy on consumers' trust in cruise services

Self-efficacy is defined as individuals' confidence in their ability to undertake recommended health behaviours before and during the cruise tour to protect themselves [12]. It can be enhanced by health and safety guidelines for consumers, health communication from crew, marketing, news reports and regulations. Supported by such information, people would feel more confident of protecting themselves and responding to possible outbreaks during the voyage. In addition, because critics are concerned about the effectiveness of safety measures, cruise operators can provide supporting resources such as CruiseSafe certification to convince them about their safety [36]. With a higher level of self-efficacy, consumers would perceive a lower risk of using cruise services, boosting their confidence in trusting the cruise operator in performing its duties safely and reliably [10].

Hence, this study proposes the positive effect of self-efficacy on consumers' trust in cruiser services after COVID-19.

H₃. *Self-efficacy has a positive impact on consumers' trust in cruise services.*

2.2.4. Cues to action on consumers' trust in cruise services

In this study, cues to action refer to the stimuli of one's use intention for cruise services, which can be internal or external [37]. On the one hand, internal motives are one's experiences of cruise travel. For example, consumers with inconvenient quarantine experiences tend to perceive less benefit of using cruise services. Likewise, consumers who

have suffered COVID-19 during a cruise tour might perceive higher risk of future cruise travelling. Overall, negative past experiences reduce consumers' trust in cruise services. On the other hand, external triggers are related to opinions and recommendations of salient individuals and support or pressure from society [23]. This concept resonates with subjective norm, which captures the influence of social pressure on individual's behavioural intention. Bae and Chang [27] found a greater effect of subjective norm on individuals' intention to perform health protection behaviour if conformity prevails in their culture. When the mainstream opinions are favourable to cruise travel, consumers expect to acquire social recognition from engaging in this activity [35]. Consequently, they will perceive benefits from complying with positive cues, engendering trust in cruise services.

H₄. *Cues to action have a positive impact on consumers' trust in cruise services.*

2.3. Direct effect of trust on consumers' intention to use cruise services

Trust in cruise operators can positively influence consumers' intention to use cruise services [9]. The positive relationship can be explained from the two dimensions of trust: performance and benevolence [38]. Firstly, performance trust is related to consumers' evaluation of the cruise operator's reliability and capability of managing an outbreak. According to the reciprocity principle, if the cruise operator shows trustworthiness to consumers, consumers tend to reciprocally express their confidence by engaging in services provided by the trusted cruise operator, which leads to greater use intention for cruise services [39].

Secondly, benevolence trust is formed when consumers believe the cruise operator's genuine expression of the customers' interest and wellness [38]. This is consistent with the theory of psychological egoism, in which people will perform a behaviour if their self-interest is protected [40]. If the consumers possess benevolence trust in the cruise operator, they are convinced that their self-interest is protected when using cruise services. Consequently, consumers will have a greater intention to perform such behaviour.

H₅. *Trust has a positive impact on consumers' intention to use cruise services after COVID-19.*

2.4. Indirect effect of trust on consumers' intention to use cruise services

The current study also proposes the indirect effect of trust on consumers' use intention for cruise services via attitude. According to Suleman et al. [15], attitude refers to an individual's cognitive or affective evaluation of a behaviour, which can be either positive or negative.

Based on the attitude theory, one's attitude towards a behaviour can be influenced by multiple dimensions, which are related to cost/risk and benefit perceptions, social norms and knowledge [27,41]. Accordingly, these elements can explain the impact of trust on consumers' attitude towards cruise services. For example, existing empirical studies showed consumers' positive attitude towards travelling after COVID-19 when the level of risk perception is low and their perceived knowledge about the disease is high [27,28]. Meanwhile, subjective norm facilitates the formation of positive attitude towards travelling after the pandemic. In addition, Ahn and Back [42] observed that consumers' perception of functional and wellness benefits contribute to their intention to repurchase for cruise services.

From the above findings, trust can be regarded as an exclusive concept that explains the elements leading to attitude. This is because trust is emplaced by consumers when their outcome expectation (perceived benefit) outweighs the perceived safety threat (perceived risk), and when they possess high self-efficacy (knowledge about the disease) and cues to actions (social norms).

Therefore, the previous argument suggests that the effect of the HBM constructs on consumers' attitude towards cruise services are positively

mediated by trust.

H₆. *Trust has a positive effect on consumers' attitude towards cruise services.*

Several recent studies concerning tourism have demonstrated the positive impact of consumers' attitude towards post-pandemic travelling on their intention. According to Han et al. [28], people's behavioural intention to travel to safer destinations after COVID-19 is significantly influenced by their attitude towards the behaviour. In addition, Zhu and Deng [26] pointed out the reduction in tourists' risk-aversion attitude because of risk- and disease-related knowledge under COVID-19, hence prompting their travel intention. Apart from travelling intention, female cruise passengers' intention to dine on a cruise ship after COVID-19 was studied by Radic et al. [13]. The result reveals that female passengers' attitude towards dining on a cruise ship has a direct and positive impact on their behavioural intention. Using cruise services after COVID-19 is considered a risk-taking behaviour; therefore, consumers will establish a decision-making process similar to post-pandemic travelling and cruise dining. Hence, this study proposes the positive impact of consumers' attitude towards cruise on their use intention for cruise services (H₇).

H₇. *Attitude has a positive effect on consumers' intention to use cruise services after COVID-19.*

3. Methodology

This study tests the theoretical model and hypotheses via structural equation modelling, as this method can analyse the interrelationships between latent variables [43]. The following subsections describe the measurement items of the constructs, the survey framework, and respondents' demographic profile.

3.1. Measurement items

measurement items are adapted from previous research to measure the constructs shown in Fig. 1. The measurement items and corresponding sources are shown in Table 2.

Perceived safety. The measurement of perceived safety threat consists of perceived susceptibility and perceived severity [32]. Perceived susceptibility (operationalised by PT1 and PT2) is the likelihood that consumers perceive they will contract COVID-19, whereas perceived severity (operationalised by PT3 and PT4) reflects how serious consumers think the result of contracting COVID-19 will be.

Outcome expectation. It can be evaluated from four dimensions: social (OE1), hedonic (OE2), economic (OE3) and utilitarian (OE4) [23]. Firstly, social benefits are perceived by consumers if using a service enhances bonds or relationships with friends and family. Secondly, hedonic benefits are perceived if consumers feel relaxed and joyful when using cruise services. Thirdly, economic benefits refer to the consumers' perceived financial worthiness compared to the price they have paid for cruise services. Finally, utilitarian benefits are the travel needs that consumers expect to obtain via cruise services.

Self-efficacy. SE1 and SE2 measure the self-efficacy resulting from individuals' own ability and knowledge, whereas SE3 and SE4 evaluate the self-efficacy attributing to external resources.

Cues to action. External cues include recommendations from friends, family and the authority, information regarding the safety of the cruise and decisions executed by the majority of the society, which are measured by CA1 to CA4. Internal cues are triggers from consumers' personal cruise experience, which is operationalised by CA5.

Trust. Performance trust refers to consumers' evaluation of cruise operators' effectiveness, knowledge and reliability of managing an outbreak, measured by TR1, TR2 and TR5, respectively. Benevolence trust refers to consumers' evaluation of the sincerity and altruism of cruise operators, which are operationalised by TR3 and TR4 accordingly.

Table 2
Construct and measurement items.

| Construct | ID | Measurement item | Adapted source |
|-------------------------|-----|--|-----------------------|
| Perceived safety threat | PT1 | My chance of getting contracted by COVID-19 is low if I use cruise services. | Huang et al. [22] |
| | PT2 | Because of my physical health, I am more likely to be infected by COVID-19 if I use cruise services. | |
| | PT3 | The thought of suffering COVID-19 scares me. | |
| | PT4 | My financial security would be endangered if I had COVID-19. | |
| Outcome expectation | OE1 | I use cruise services to interact with my friends and family. | Han and Hyun [35] |
| | OE2 | Travelling with cruise lines is truly a joy. | |
| | OE3 | Compared to the price I paid, I think I will receive good value while using cruise services. | |
| | OE4 | Using cruise services will compensate for what I miss in my daily life during the COVID-19 pandemic period. | Severt and Tasci [45] |
| Self-efficacy | SE1 | I know how to protect myself from being contracted by COVID-19. | Fisher et al. [12] |
| | SE2 | I can perform safety precautions when I want to (e.g. wearing a mask, frequent hand-washing and social distancing). | |
| | SE3 | I would get help from others when I have difficulties performing safety precautions. | Yuen et al. [23] |
| | SE4 | I would have the resources necessary to perform safety precautions. | |
| Cues to action | CA1 | My family and friends will support me if I use cruise services post COVID-19. | Yuen et al. [23] |
| | CA2 | Overall, I am encouraged by the authority to use cruise services post COVID-19. | |
| | CA3 | I will only use cruise services post COVID-19 if I am given adequate external information about the existing safety precautions. | Wong et al. [46] |
| | CA4 | I will only use cruise services post COVID-19 if more people are using cruise services again. | |
| | CA5 | Personal experience with cruise services prompted me to use it again post COVID-19. | |
| Trust | TR1 | I believe that the health management of cruise operators is effective and sustainable. | Yuen et al. [39] |
| | TR2 | I believe that cruise operators are knowledgeable with respect to implementing effective health management. | |
| | TR3 | I believe that cruise operators are sincere and genuine in implementing effective health management. | |
| | TR4 | The intention of cruise operators is altruistic and thoughtful rather than guided by self-interest. | Yuen et al. [23] |
| | TR5 | My trust in cruise services will be based on the reliability of the safety measures of cruise operators. | |
| Attitude | AT1 | I think using cruise services is a foolish (1) / wise (9) idea. | Yuen et al. [23] |
| | AT2 | I think using cruise services for vacation is a bad (1) / good (9) idea. | |
| | AT3 | I think using cruise services would be unenjoyable (1) / enjoyable (9). | |
| | AT4 | I think cruise tours would be unpleasant (1) / pleasant (9) for me. | |
| Intention | IN1 | I intend to use cruise services post COVID-19. | Zhao et al. [16] |
| | IN2 | I consider using cruise services to be my first choice for my travel needs post-COVID-19. | Yuen et al. [44] |
| | IN3 | | |

Table 2 (continued)

| Construct | ID | Measurement item | Adapted source |
|-----------|-----|--|----------------|
| | | My intention to use cruise services for the next holiday trip post COVID-19 is likely. | |
| | IN4 | I would recommend cruise trips to my friends post COVID-19. | |
| | IN5 | I will say positive things about cruise services post COVID-19 to my friends. | |

Attitude. Cognitive attitude (operationalised by AT1 and AT2) reflects consumers' thoughts about this behaviour, whereas affective attitude (operationalised by AT3 and AT4) reflects consumers' feelings.

Intention. It is reflected by five measurement items widely used for measuring intention [8,16,44]. The first three measurement items capture the behavioural intention, which refers to consumers' plan of using cruise services for their next trip after COVID-19. The other two items relate to attitudinal intention, namely, the intention to recommend cruise services to friends and spreading positive word of mouth.

3.2. Survey design and administration

The survey questionnaire comprises three sections: an introduction, demographic questions and measurement items. Firstly, it starts with a brief review of the previous COVID-19 outbreaks on cruise ships and introduces the purpose of this survey. Afterwards, respondents must answer six demographic questions related to their age, gender, income, education, past cruise travel experience and the availability of cruise port near their residential areas. Lastly, respondents are supposed to rate measurement items on a 9-point Likert scale based on their agreeableness. The survey respondents' anonymity is assured so that they can be honest with their answers.

The questionnaire was targeted at residents in China. As the local health risks are relatively low in China currently, and people are getting accustomed to performing safety precautions, it is more realistic for respondents to re-evaluate the cruise travel experience after the pandemic. In addition, the cruise business in China has been highlighted with prominent growth in the past decade because of the increasing middle-class population and with governmental support [47]. For ease of reading, the questionnaire was translated to Chinese by a language editor. Thereafter, the questionnaire was again translated to English and compared with the original one. Lastly, the Chinese version was finalised after some adjustments and subsequently uploaded to a survey website (www.wjx.cn). The link of questionnaire was disseminated to several WeChat groups associated with the tourism industry. Respondents who received the link can choose to access the survey form anytime, and they received an e-cash voucher upon completion of the survey. The survey was administered from 2 January to 16 February 2021, and 376 responses were collected.

3.3. Demographic profile

As shown in Table 3, the proportions of male and female respondents are 48.94% and 51.06%, respectively. The gender proportion roughly matches the Chinese national population parameter, which was 51.19% and 48.81%, respectively, as recorded by the National Bureau of Statistics of China in 2010 (<http://www.stats.gov.cn/tjsj/pcsj/rkpc/6rp/index.htm>). This survey has 58% of respondents aged below 40 and 42% above 40, covering both young and older generations.

Regarding income level, the survey recorded an average monthly income of 10,715 CNY, higher than the national statistics of employed persons in urban units (7541 CNY/month) in 2019 [48]. A cruise vacation is a luxury; therefore, people with medium-to-high income have higher disposable income and can afford cruise services [49]. The sample also represents a population with a high education level in which

Table 3
Respondents' demographics and cruise-related experiences.

| Characteristics | Observations | Frequency (n = 376) | Percentage (%) |
|--|------------------------------|------------------------|-------------------|
| Gender | Male | 184 | 48.94 |
| | Female | 192 | 51.06 |
| Age | ≤20 years | 20 | 5.32 |
| | 21–30 years | 115 | 30.59 |
| | 31–40 years | 83 | 22.07 |
| | 41–50 years | 102 | 27.13 |
| | 51–60 years | 49 | 13.03 |
| Monthly income (CNY) | ≥60 years | 7 | 1.86 |
| | 0 | 49 | 13.03 |
| | ≤3000 | 36 | 9.57 |
| | 3001–5000 | 62 | 16.49 |
| | 5001–9000 | 90 | 23.94 |
| | 9001–15,000 | 61 | 16.22 |
| Education level | >15,000 | 78 | 20.74 |
| | Junior high school and below | 6 | 1.60 |
| | Technical secondary school | 16 | 4.26 |
| | Senior high school | 16 | 4.26 |
| | Junior college | 65 | 17.29 |
| | Undergraduate | 206 | 54.79 |
| | Postgraduate | 67 | 17.82 |
| Prior experience of using cruise services | Yes | 124 | 32.98 |
| | No | 252 | 67.02 |
| Availability of cruise port/terminal in residential area | Yes | 189 | 50.27 |
| | No | 187 | 49.73 |

around 70% have at least a bachelor's degree. It is consistent with the demographics of cruise users in China (65.5%), as suggested by Sun et al. [50].

In terms of cruise-related information, one-third of respondents have declared prior cruise travel experience, and nearly 50% of respondents claimed that they live near a cruise port or terminal. The balanced proportion of each sub-group ensures balance in opinions. Overall, the sample can adequately represent the profile of Chinese cruise consumers.

3.4. Bias examination

The following are two main bias that could impair the validity of results collected via the survey questionnaire. First, non-response bias may exist between early and late respondents. Late respondents may not be prepared when answering the questions because they have less time to complete the survey, showing certain characteristics that resemble non-respondents. In the non-response bias test, 376 responses were split into two groups according to the time taken from the release to completion of survey. Thereafter, an independent *t*-test was conducted to calculate and compare the mean of each construct between the two groups. The results are not significant ($p > 0.05$) indicating negligible response bias.

Second, common method bias refers to the phenomenon that responses collected from a single source (e.g. online survey) tend to show a certain propensity, causing over- or understatement of results. Harman's single factor test was conducted to determine the influence of common method bias. The results showed 38% variance when are measurement items are loaded on a single construct. Hence, common method bias does not have a significant impact on the research.

4. Results and discussion

The first subsection tests the overall fitness, reliability and validity of the survey questions. The second subsection examines the model. The third subsection discusses the effect analysis.

4.1. Confirmatory factor analysis

The confirmatory factor analysis is performed to examine the overall fitness, reliability and validity of measurement items. The model fit indices including chi-square fit index, CFI, TLI, RMSEA and SRMR are presented in Table 4. All indices passed the minimum cut off point proposed by Hu and Bentler [51], indicating excellent model fit. Next, the reliability and validity of measurement items will be assessed with standardised loading factor (λ), average variance extracted (AVE) and composite reliability (CR).

Firstly, reliability analysis is conducted based on the values of λ and CR. When the correlation between each measurement item and corresponding construct (i.e. λ) exceeds 0.7, and when CRs are greater than 0.8, the model can be deemed reliable. As presented in Table 4, all λ s and CRs have passed the reliability test.

Secondly, the validity of measurement items is evaluated by AVE, which is further examined through convergent analysis and discriminant analysis. In Table 5, all AVEs are greater than 0.5, which indicates convergent validity. In addition, each construct has an AVE greater than its squared correlations with other constructs. Hence, all measurement items are considered unidimensional, achieving discriminant validity.

4.2. Structural model analysis

This section discusses the structural model, hypotheses and the impacts of control variables. In Fig. 2, the standardised estimated correlations of the constructs are shown on the arrows, and the squared multiple correlations (R^2) are indicated above the endogenous constructs. Moreover, three control variables – age, education and experience – are linked to consumers' use intention for cruise services. These control variables were noted to impact consumers' future cruise travel intention [49].

In general, the fit indices indicate a good model fit. Moreover, all

Table 4
Confirmatory factor analysis results.

| Construct | Item | λ | AVE | CR |
|------------------------------|------|-----------|-------|-------|
| Perceived safety threat (PT) | PT1 | 0.753 | 0.651 | 0.903 |
| | PT2 | 0.807 | | |
| | PT3 | 0.821 | | |
| | PT4 | 0.828 | | |
| Outcome expectation (OE) | OE1 | 0.751 | 0.701 | 0.903 |
| | OE2 | 0.854 | | |
| | OE3 | 0.951 | | |
| | OE4 | 0.779 | | |
| Self-efficacy (SE) | SE1 | 0.707 | 0.648 | 0.901 |
| | SE2 | 0.814 | | |
| | SE3 | 0.916 | | |
| | SE4 | 0.843 | | |
| Cues to action (CA) | CA1 | 0.736 | 0.600 | 0.881 |
| | CA2 | 0.797 | | |
| | CA3 | 0.722 | | |
| | CA4 | 0.814 | | |
| | CA5 | 0.795 | | |
| Trust (TR) | TR1 | 0.824 | 0.685 | 0.915 |
| | TR2 | 0.890 | | |
| | TR3 | 0.904 | | |
| | TR4 | 0.724 | | |
| | TR5 | 0.783 | | |
| Attitude (AT) | AT1 | 0.761 | 0.759 | 0.926 |
| | AT2 | 0.858 | | |
| | AT3 | 0.956 | | |
| | AT4 | 0.898 | | |
| Intention (IN) | IN1 | 0.808 | 0.794 | 0.950 |
| | IN2 | 0.902 | | |
| | IN3 | 0.924 | | |
| | IN4 | 0.936 | | |
| | IN5 | 0.879 | | |

Model fit indices: $\chi^2/df = 1.857$, ($p < 0.05$); CFI = 0.976; TLI = 0.973; RMSEA = 0.049; SRMR = 0.055.

Table 5
Validity results.

| | PT | OE | SE | CA | TR | AT | IN |
|----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| PT | 0.651 | 0.062 | 0.047 | 0.001 | 0.223 | 0.003 | <0.001 |
| OE | -0.249 | 0.701 | 0.100 | 0.124 | 0.454 | 0.018 | 0.015 |
| SE | -0.216 | 0.316 | 0.648 | 0.013 | 0.156 | 0.023 | 0.015 |
| CA | -0.036 | 0.352 | 0.113 | 0.600 | 0.082 | 0.038 | 0.062 |
| TR | -0.472 | 0.674 | 0.395 | 0.286 | 0.685 | 0.262 | 0.257 |
| AT | 0.061 | 0.134 | 0.151 | 0.196 | 0.512 | 0.759 | 0.297 |
| IN | 0.002 | 0.124 | 0.123 | 0.248 | 0.507 | 0.545 | 0.794 |

Main diagonal contains AVE.

Below main diagonal contains correlations.

Above main diagonal contains squared correlations.

squared multiple correlations (R^2) exceed 0.5, suggesting sufficient explanatory power of the model.

As shown in Fig. 2, the perceived safety threat, outcome expectation, self-efficacy and cues to action have significant impacts on trust ($p < 0.05$); therefore, H_1 to H_4 are accepted. Accordingly, their correlations with trust are -0.52 , 0.61 , 0.39 and 0.28 . Consumers' trust in cruise services is developed when they perceived higher benefit than risk according to trust theory. In HBM, perceived safety threat reflects consumers' perception of the risk associated with using cruise services after the pandemic, whereas outcome expectation implies that consumers perceive net positive functional (e.g. travelling and dining), hedonic (e.g. pleasant experience about cruise trip), economic (e.g. worthiness of spending) and social benefits (e.g. closer relationship with family and friends) from cruise services. Furthermore, consumers with higher self-efficacy believe that they possess adequate knowledge and ability to perform health and safety precautions during cruise trips. Therefore, they would perceive lower risk when using cruise services after COVID-19. Lastly, consumers receiving positive cues would tend to trust the cruise operators. Positive internal cues (e.g. prior cruise travel experience) and external cues (e.g. word of mouth and instructions from the authority) can enhance consumers' perceived benefit and reduce perceived risk. In this study, HBM explains 62% of the variance in consumers' trust ($R^2 = 0.62$), demonstrating its strong explanatory power. The result suggests greater tendency for consumers to trust cruise services if they perceive lower safety threat, positive outcome and high self-efficacy, and receive positive cues to action from themselves and others.

Fig. 2 also shows a significant direct impact of trust on consumers' intention to use cruise services, where the standardised effect is 0.39 ($p < 0.05$). Therefore, H_5 is accepted. The result supports trust theory

from both performance and benevolence dimensions. Being convinced that cruise operators are reliable and competent and altruistic in handling outbreaks, consumers would trust cruise operators, leading to greater intention to use their services.

Trust also has a significant indirect effect on intention via attitude. The correlation between trust and attitude is 0.62 ($p < 0.05$), and that between attitude and intention is 0.26 ($p < 0.05$). Therefore, H_6 and H_7 are accepted. According to attitude theory, consumers' attitude represents their evaluation of multiple dimensions, including perceived benefits and cost, knowledge and social norms. These dimensions are reflected by the four constructs of HBM, which are the underlying factors of consumers' trust. Therefore, trust is the antecedent of a positive attitude towards cruise services. As a result, trust imposes a direct effect on attitude with explanatory power (R^2) of 0.39 .

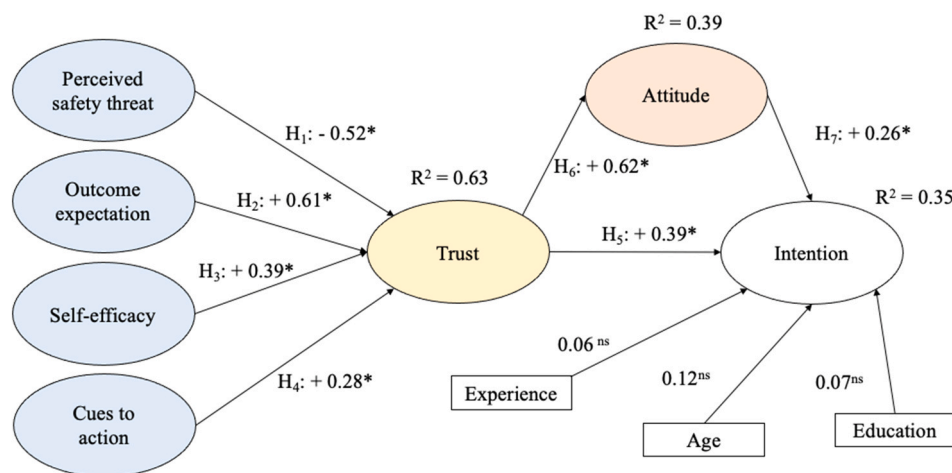
In addition, attitude exhibits a positive correlation with consumers' use intention for cruise services, which is consistent with attitude theory. It shows that consumers with a positive attitude towards cruise services have a higher propensity to use cruise services after COVID-19. When people have a positive evaluation of the consequence, they are more willing to perform or pursue the course of action.

Finally, trust, attitude and control variables jointly explain for 35% of the variance in consumers' intention to use cruise services ($R^2 = 0.35$). Selected control variables are 'past experience', 'age' and 'education' with standardised effects of 0.06 , 0.12 and 0.07 , but none of them are significant ($p > 0.05$). The insignificant effect of age on consumers' intention is aligned with the cruise consumers' profile of Mainland China reported by Cruise Lines International Association [52], which illustrated nearly equal proportions among different age groups. However, the findings on the impacts of education and experience are insignificant. The results are unexpected as people with higher educational backgrounds should possess the knowledge to protect themselves, and cruise experience could ease people's worry arising from their unfamiliarity of cruise. The insignificant effects of control variables may also be ascribed to the current public prevention measures. So far, the Chinese government does not encourage overseas travel and implements strict and prolonged quarantine on returnees, which depress consumers' intention to use cruise services across all populations.

4.3. Effect analysis

This study examines the effects of exogenous variables on endogenous variables as presented in Table 6.

Referring to the theoretical model in Fig. 2, trust fully mediates



Note: * indicates that the path estimate is significant ($p < 0.05$); ns stands for not significant
Model fit indices: $\chi^2/df = 2.153$, ($p < 0.05$); CFI = 0.958; TLI = 0.956; RMSEA = 0.066; SRMR = 0.072

Fig. 2. The structural model.

intention and the four constructs of the HBM. In addition, the attitude partially mediates trust and intention.

In terms of the direct effects, the main predictor of trust is outcome expectation ($a_{21} = 0.61$), followed by perceived safety threat ($a_{11} = 0.52$), self-efficacy ($a_{31} = 0.39$) and cues to action ($a_{41} = 0.28$). Trust is the only direct exogenous variable of attitude ($a_{52} = 0.62$). Lastly, trust has a larger direct effect on intention ($a_{53} = 0.39$) compared to attitude ($a_{63} = 0.26$).

Regarding the indirect effects, the perceived safety threat, outcome expectation, self-efficacy and cues to action indirectly affect consumers' attitude. Similar to their direct effects on trust, outcome expectation has the largest indirect effect on attitude ($b_{22} = 0.38$), followed by perceived safety threat ($b_{12} = 0.32$), self-efficacy ($b_{32} = 0.24$) and cues to actions ($b_{42} = 0.17$). Furthermore, in descending order, outcome expectation ($b_{23} = 0.34$), perceived safety threat ($b_{13} = 0.29$), self-efficacy ($b_{33} = 0.21$), trust ($b_{53} = 0.16$) and cues to action ($b_{43} = 0.15$) have indirect effects on consumers' intention to use cruise services. Hereinto, the indirect effects of outcome expectation, perceived safety threat, self-efficacy and cues to action are channelled via a single mediator (i.e. trust) and dual mediators (i.e. trust and attitude).

For the total effects, trust has the largest total effect on intention ($c_{53} = 0.55$), which results from adding its direct and indirect effect via attitude on intention. Next, the outcome expectation has the second largest effect ($c_{23} = 0.34$), followed by perceived safety threat ($c_{13} = 0.29$). Attitude ranks fourth ($c_{63} = 0.26$), which is traced to its direct effect on intention (a_{63}). The remaining factors are self-efficacy ($c_{33} = 0.21$) and cues to action ($c_{43} = 0.15$).

5. Conclusion

5.1. Summary and theoretical contributions

The cruise industry has been severely hit by the COVID-19 pandemic. To understand how the cruise industry could be recovered after the pandemic, this study examines the determinants of consumers' intention to use cruise services. Supported by three psychological theories (i.e. HBM, trust theory and attitude theory), this study designs a model that illustrates consumers' intention to use cruise services. The study argues that consumers' trust in cruise operators and positive attitude towards cruise services contribute to the formation of consumers' use intention for cruise services. Trust is developed when consumers perceive higher benefit than risk, which can be enhanced by reducing consumers' perceived safety threat, improving outcome expectation and self-

Table 6
Direct, indirect and total effects.

| Endogenous (j) Exogenous (i) | TR (1) | AT (2) | IN (3) |
|---|--------|--------|--------|
| <i>Direct effects (a_{ij}) of ...</i> | | | |
| PT (1) | 0.52 | — | — |
| OE (2) | 0.61 | — | — |
| SE (3) | 0.39 | — | — |
| CA (4) | 0.28 | — | — |
| TR (5) | — | 0.62 | 0.39 |
| AT (6) | — | — | 0.26 |
| <i>Indirect effects (b_{ij}) of ...</i> | | | |
| PT (1) | — | 0.32 | 0.29 |
| OE (2) | — | 0.38 | 0.34 |
| SE (3) | — | 0.24 | 0.21 |
| CA (4) | — | 0.17 | 0.15 |
| TR (5) | — | — | 0.16 |
| AT (6) | — | — | — |
| <i>Total effects (c_{ij}) of ...</i> | | | |
| PT (1) | 0.52 | 0.32 | 0.29 |
| OE (2) | 0.61 | 0.38 | 0.34 |
| SE (3) | 0.39 | 0.24 | 0.21 |
| CA (4) | 0.28 | 0.17 | 0.15 |
| TR (5) | — | 0.62 | 0.55 |
| AT (6) | — | — | 0.26 |

efficacy, and providing positive cues to action. Subsequently, consumers will hold a positive attitude towards cruise services if they trust cruise operators.

To examine the model, an online survey was administered in China, and 376 responses were collected. After conducting structural equation modelling, this study confirmed both full and partial mediation effects in the theoretical model. Fully mediated by trust, health belief components exhibit indirect impacts on consumers' attitude and intention to use cruise services. Further, the attitude partially mediates the relationship between trust and intention. The total effect analysis indicates that consumers' intention to use cruise services is impacted most largely by trust, followed by outcome expectation, perceived safety threat, attitude, self-efficacy and cues to action.

This study makes three main contributions to the existing theories. Firstly, it introduces and integrates three theories covering health belief, trust and attitude, to understand consumers' intention to involve in a health-risk-taking behaviour after the health crisis. The theoretical model not only addresses consumers' own health beliefs but also considers their confidence (i.e. trust), thoughts and feelings (i.e. attitude) about the service provider. As one step beyond the existing research focused on marketing aspects of cruise services, this study investigates consumers' intention from a new perspective. The three theories together give a comprehensive explanation of the formation of consumers' intention to use cruise services after COVID-19.

Secondly, this study enriches trust theory by providing detailed and contextualised determinants (i.e. perceived safety threat, outcome expectation, self-efficacy and cues to action) so that it can be used to analyse consumers' intention to use cruise services post COVID-19. Overall, these determinants are complementary and provide significant explanatory power (35%) on consumers' intention to use cruise services. Other health-related studies have directly linked health beliefs to behavioural intention, whereas this study introduces trust as an intermediate factor, which involves the evaluation of benefit and risks. Hence, the mediation role of trust better reflects consumers' psychological process that leads to the final intention.

Finally, the study explains the nomological relationship of the constructs influencing consumers' intention to use cruise services. Evidenced by the survey results, the study proposes HBM constructs to be inputs that create consumers' trust. Conversely, trust and attitude are directly linked to consumers' intention to use cruise services. This finding is consistent with the arguments suggested by several studies on consumers' behavioural intention using different theoretical approaches, which assert that consumers' decision to accept a product or service is driven by trust and attitude [15,16,41]. Therefore, health beliefs are the predictors of trust, which in turn influences attitude and intention to use cruise services.

5.2. Strategic and policy implications

The findings of this study provide implications for both cruise operators and policymakers to enhance consumers' intention to use cruise services. The implications will be explained construct by construct, following the descending order of the total effect.

Among all determinants, trust is the most important. Therefore, cruise operators should try cultivating consumers' trust in both performance and benevolence dimensions [38]. Concerning performance trust, cruise operators may increase consumers' perception of its reliability, knowledge and health management by conducting an information-sharing session to consumers before the journey starts. A showcase of daily cruise operation will allow consumers to learn more about how crew members conduct cleaning work professionally. As for benevolence trust, cruise operators should train their crew onboard and customer care team ashore to be responsive to and responsible for consumers' health concerns and complaints.

The next factor is outcome expectation that cruise operators can ameliorate from social, hedonic, economic and utilitarian aspects [23].

Firstly, cruise operators may offer a discount for group or family booking to increase consumers' perceived social and economic benefits simultaneously. Secondly, consumers tend to spend more time in the cabin due to safety precautions onboard. Thus, cruise operators can provide indoor entertainment facilities, such as dance mats and virtual reality equipment, thereby enhancing the hedonic and utilitarian benefits of cruise services.

The third important factor is the perceived safety threat, containing perceived susceptibility and perceived severity. Although severity can hardly be interfered by humans, it might be more realistic to reduce perceived susceptibility. On the one hand, cruise operators can assure consumers with detailed daily safety precautions and contingency plan for the outbreak. On the other hand, policymakers should implement strict regulations on pre-trip swab test or vaccination.

A positive attitude towards cruise services motivates consumers to take a cruise trip. It can be developed by disseminating marketing materials describing the joyful and unique experience of cruise trip and emphasising a match of target consumers' lifestyle.

As aforementioned, self-efficacy is defined as consumers' confidence in their ability to protect themselves during the cruise trip. Cruise operators and the authority can collectively advise consumers on personal hygienic practice, such as wearing a mask, social distancing and frequent hand washing. Further, cruise operators may employ personnel onboard responding to consumers' queries on health precautions.

Cues to action refer to the internal and external motives of consumers' intention to use cruise services. Internal cues are related to one's experience, whereas external cues are developed by word of mouth, official opinions and the majority's behaviour. The most controllable way to create cues is through word of mouth; hence, cruise operators can incentivise existing cruise users to recommend cruise services to friends who are potential consumers. Consequently, both the referrer and referee can enjoy a discount on the next cruise trip.

5.3. Limitations and recommendations

Although this study contributes to research in consumers' intention to use cruise services after COVID-19, some limitations exist. Firstly, the survey was conducted in China with a unique demographic profile that does not apply to other countries. For example, Chinese parents commonly stay home and look after their grandchildren after retirement. In contrast, the elderly in Western countries tends to travel more often. Therefore, the demographic and cultural differences must be considered when interpreting the findings for other geographical regions. Future research may cross-validate the theoretical model in other countries to extend its application.

Secondly, the survey of this study was only accessible to smartphone users. Non-smartphone users such as young students and the elderly are excluded from the sample, which may result in representativity issues. This is because people using smartphones may share certain characteristics, such as familiarity with technology and interest in new things. Hence, future research could compare the data collected from smartphone and non-smartphone users to examine the universality of the research model.

Finally, the COVID-19 situation is still changing every day. By March 2021, vaccination has been completed by a group of Chinese residents like medical workers. As more people gain immunity through vaccines, consumers' concern for the safety threat may decrease. However, the influence of vaccine is difficult to measure at the moment. Therefore, future research could investigate the effect of the vaccine on consumers' intention to use cruise services.

Acknowledgements

This article is financially supported by School of Civil and Environmental Engineering, Nanyang Technology University, Final Year Project Funds.

References

- [1] World Tourism Organization, COVID-19 related travel restrictions: a global review for tourism, UNWTO Report (2021).
- [2] Centers for Disease Control and Prevention, CDC's role in helping cruise ship travelers during the COVID-19 pandemic, *Your Health* (2020).
- [3] Norwegian Cruise Line, Norwegian cruise line holdings reports second quarter 2020 financial results, Press Release (2020).
- [4] Cruise Lines International Association, State of the cruise industry outlook, CILA (2021).
- [5] P. Jones, D. Hillier, D. Comfort, The environmental, social and economic impacts of cruising and corporate sustainability strategies, *Athens J. Tour.* 3 (4) (2016) 273–286.
- [6] S. Mallapaty, What the cruise-ship outbreaks reveal about COVID-19, *Nature* 580 (2020) 18.
- [7] J. Holland, T. Mazzarol, G.N. Soutar, S. Tapsall, W.A. Elliott, Cruising through a pandemic: the impact of COVID-19 on intentions to cruise, *Transp. Res. Interdiscip. Perspect.* 9 (2021), 100328.
- [8] F. Calza, M. Pagliuca, M. Risitano, A. Sorrentino, Testing moderating effects on the relationships among on-board cruise environment, satisfaction, perceived value and behavioral intentions, *Int. J. Contemp. Hosp. Manag.* 32 (2) (2020) 934–952.
- [9] H.-C. Wu, C.-C. Cheng, C.-H. Ai, A study of experiential quality, experiential value, trust, corporate reputation, experiential satisfaction and behavioral intentions for cruise tourists: the case of Hong Kong, *Tour. Manag.* 66 (2018) 200–220.
- [10] B. Liu, L. Pennington-Gray, J. Krieger, Tourism crisis management: can the extended parallel process model be used to understand crisis responses in the cruise industry? *Tour. Manag.* 55 (2016) 310–321.
- [11] M.-R. Chiou, S.-L. Chao, H.-Y. Hsieh, The moderating role of service recovery on customer loyalty in the context of cruise passengers, *Marit. Policy Manag.* 48 (2020) 1–17.
- [12] J.J. Fisher, B.A. Almanza, C. Behnke, D.C. Nelson, J. Neal, Norovirus on cruise ships: motivation for handwashing? *Int. J. Hosp. Manag.* 75 (2018) 10–17.
- [13] A. Radic, M. Lück, A. Al-Ansi, B.L. Chua, S. Seeler, A. Raposo, J.J. Kim, H. Han, To dine, or not to dine on a cruise ship in the time of the COVID-19 pandemic: the tripurite approach towards an understanding of behavioral intentions among female passengers, *Sustainability* 13 (5) (2021) 1–18.
- [14] T. Pan, F. Shu, M. Kitterlin-Lynch, E. Beckman, Perceptions of cruise travel during the COVID-19 pandemic: market recovery strategies for cruise businesses in North America, *Tour. Manag.* 85 (2021), 104275.
- [15] D. Suleman, H. Ali, D. Nusraningrum, M.M. Ali, Perceived ease of use, trust and risk toward attitude and intention in shopping for online fashion products in Indonesia, *Arch. Bus. Res.* 7 (4) (2019).
- [16] J. Zhao, S. Fang, P. Jin, Modeling and quantifying user acceptance of personalized business modes based on TAM, trust and attitude, *Sustainability* 10 (2) (2018) 356.
- [17] S.K. Saad, I.A. Elshaer, Justice and trust's role in employees' resilience and business' continuity: Evidence from Egypt, *Tour. Manag. Perspect.* 35 (2020), 100712.
- [18] K. Srivastava Rajesh, Rebuilding a global brand under crisis – case of a global brand Maggi, *Int. J. Pharm. Healthc. Mark.* 13 (2) (2019) 118–139.
- [19] World Health Organization, What is post-pandemic? *Emergencies Preparedness, Response* (2010).
- [20] S.E. Jung, Y.H. Shin, R. Dougherty, A multi theory-based investigation of college students' underlying beliefs about local food consumption, *J. Nutr. Educ. Behav.* 52 (2020) 907–917.
- [21] T. Torosian, E.A. Abrami, R.L. Massoumi, N.M. Harutyunyan, G. Dallakyan, H. Hovhannisyann, M. Hovhannisyann, A.J. Dawes, A. Aboulian, S. Shekherdimian, Assessing knowledge and perceptions of colorectal cancer screening in Armenia, *J. Surg. Res.* 257 (2021) 616–624.
- [22] H.T. Huang, Y.M. Kuo, S.R. Wang, C.F. Wang, C.H. Tsai, Structural factors affecting health examination behavioral intention, *Int. J. Environ. Res. Public Health* 13 (4) (2016) 395.
- [23] K.F. Yuen, F. Ma, X. Wang, G. Lee, The role of trust in influencing consumers' adoption of automated vehicles: an application of the health belief model, *Int. J. Sustain. Transp.* (2020) 1–13.
- [24] C. Castelfranchi, R. Falcone, *Trust Theory: a Socio-Cognitive and Computational Model*, John Wiley & Sons, West Sussex, United Kingdom, 2010.
- [25] K. Glanz, B.K. Rimer, K. Viswanath, *Health Behavior and Health Education: Theory, Research, and Practice*, John Wiley & Sons, San Francisco, CA, 2008.
- [26] H. Zhu, F. Deng, How to influence rural tourism intention by risk knowledge during COVID-19 containment in China: mediating role of risk perception and attitude, *Int. J. Environ. Res. Public Health* 17 (10) (2020) 3514.
- [27] S.Y. Bae, P.J. Chang, The effect of coronavirus disease-19 (COVID-19) risk perception on behavioural intention towards 'untact' tourism in South Korea during the first wave of the pandemic (March 2020), *Curr. Issues Tour.* 24 (2020) 1017–1035.
- [28] H. Han, A. Al-Ansi, B.L. Chua, B. Tariq, A. Radic, S.H. Park, The post-coronavirus world in the international tourism industry: application of the theory of planned behavior to safer destination choices in the case of us outbound tourism, *Int. J. Environ. Res. Public Health* 17 (18) (2020) 1–15.
- [29] S. Forgas-Coll, R. Palau-Saumell, J. Sánchez-García, E.M. aría Caplliure-Giner, The role of trust in cruise passenger behavioral intentions: the moderating effects of the cruise line brand, *Manag. Decis.* 52 (8) (2014) 1346–1367.
- [30] Z.E. Mao, M.F. Jones, M. Li, W. Wei, J. Lyu, Sleeping in a stranger's home: a trust formation model for Airbnb, *J. Hosp. Tour. Manag.* 42 (2020) 67–76.

- [31] K.F. Yuen, K.X. Li, F. Ma, X. Wang, The effect of emotional appeal on seafarers' safety behaviour: an extended health belief model, *J. Transp. Health* 16 (2020), 100810.
- [32] W. Nambulee, S. Jomnonkwo, S. Siridhara, V. Ratanavaraha, Modelling of seat belt use intention for intercity buses based on health belief model, *Transp. A Transp. Sci.* 15 (2) (2019) 944–962.
- [33] N.G. Davies, P. Klepac, Y. Liu, K. Prem, M. Jit, R.M. Eggo, Age-dependent effects in the transmission and control of COVID-19 epidemics, *Nat. Med.* 26 (8) (2020) 1205–1211.
- [34] K.F. Yuen, D.T.K. Huyen, X. Wang, G. Qi, Factors influencing the adoption of shared autonomous vehicles, *Int. J. Environ. Res. Public Health* 17 (13) (2020) 1–16.
- [35] H. Han, S.S. Hyun, Cruise travel motivations and repeat cruising behaviour: impact of relationship investment, *Curr. Issues Tour.* 22 (7) (2019) 786–805.
- [36] W.K. Ng, Singaporeans' opinions mixed over safety of 'cruises to nowhere' despite new measures, *Straits* (2020).
- [37] M. Boazar, A. Abdeslahi, M. Yazdanpanah, Changing rice cropping patterns among farmers as a preventive policy to protect water resources, *J. Environ. Plan. Manag.* 63 (14) (2020) 2484–2500.
- [38] G. Denton, O.H. Chi, D. Gursoy, An examination of the gap between carbon offsetting attitudes and behaviors: role of knowledge, credibility and trust, *Int. J. Hosp. Manag.* 90 (2020), 102608.
- [39] K.F. Yuen, X. Wang, Y.D. Wong, Q. Zhou, The effect of sustainable shipping practices on shippers' loyalty: the mediating role of perceived value, trust and transaction cost, *Transp. Res. Part E Logist. Transp. Rev.* 116 (2018) 123–135.
- [40] Y. Sun, J. Zhang, Acquiescence or resistance: group norms and self-interest motivation in unethical consumer behaviour, *Sustainability* 11 (8) (2019) 2190.
- [41] F. Fornara, P. Pattitoni, M. Mura, E. Strazzera, Predicting intention to improve household energy efficiency: the role of value-belief-norm theory, normative and informational influence, and specific attitude, *J. Environ. Psychol.* 45 (2016) 1–10.
- [42] J. Ahn, K.-J. Back, Cruise brand experience: functional and wellness value creation in tourism business, *Int. J. Contemp. Hosp. Manag.* 31 (5) (2019) 2205–2223.
- [43] D.L. Streiner, Building a better model: an introduction to structural equation modelling, *Can. J. Psychiatry* 51 (5) (2006) 317–324.
- [44] K.F. Yuen, X. Wang, F. Ma, Y.D. Wong, The determinants of customers' intention to use smart lockers for last-mile deliveries, *J. Retail. Consum. Serv.* 49 (2019) 316–326.
- [45] D. Severt, A. Tasci, Cruising back to the basic needs, *Int. J. Cult. Tour. Hosp. Res.* 14 (2020) 173–187.
- [46] L.P. Wong, H. Alias, P.-F. Wong, H.Y. Lee, S. AbuBakar, The use of the health belief model to assess predictors of intent to receive the COVID-19 vaccine and willingness to pay, *Hum. Vaccin. Immunother.* 16 (9) (2020) 2204–2214.
- [47] Q. Ma, Y. Chang, S. Zhou, Spotlight: Chinese Cruise Tourism Market to Flourish with Massive Growth Potential, *XinhuaNet*, 2019.
- [48] National Bureau of Statistics of China, *Employment and wage, National Data* (2020).
- [49] C. Tang, D. Weaver, F. Shi, M.F. Huang, Y. Liu, Constraints to domestic ocean cruise participation among higher income Chinese adults, *Int. J. Tour. Res.* 21 (4) (2019) 519–530.
- [50] X. Sun, X. Feng, D.K. Gauri, The cruise industry in China: efforts, progress and challenges, *Int. J. Hosp. Manag.* 42 (2014) 71–84.
- [51] L.T. Hu, P.M. Bentler, Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives, *Struct. Equ. Model. Multidiscip. J.* 6 (1) (1999) 1–55.
- [52] Cruise Lines International Association, *Asia Cruise Trend 2018 Edition* (2018).