Contents lists available at ScienceDirect



International Journal of Disaster Risk Reduction

journal homepage: www.elsevier.com/locate/ijdrr



Post COVID-19: Health crisis management for the cruise industry



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A R T I C L E I N F O

Keywords: COVID-19 Management strategies Intention Value Trust

ABSTRACT

The cruise industry is gravely affected by the COVID-19 pandemic due to rising public health concerns. This study combines and examines health crisis management and marketing theories to address public health concerns and improve the usage of cruise services. Combining social exchange theory, customers' perceived value theory, and trust theory, a theoretical model is proposed. Survey data (n = 376) are then collected through an online survey that is conducted on the Chinese tourism market. The finding shows that quality management, health management, social and communication strategies, and financial strategies contribute to customers' perceived value of cruise service. In addition, perceived value directly and indirectly influences customers' intention to use cruise service through trust in cruise company's pandemic management capability. This study expands the current literature on cruise industry to cope with the pandemic by focusing on public health concerns and psychology.

1. Introduction

In late December 2019, COVID-19 spread rapidly worldwide. People who are infected by the virus can be seriously sick or even lose their lives, especially the aged ones. Moreover, person-to-person transmission via droplets and human contact makes COVID-19 extremely hard to control [1]. Following the Diamond Princess cruise ship, which reported a large number of confirmed infected cases onboard and was quarantined in Japan in February, 25 other cruise ships reported more than 800 confirmed cases and 10 deaths in the next two months. In March 2020, the Cruise Lines International Association and the Centers for Disease Control and Prevention (CDC) in the United States recommended that all cruise trips worldwide should be deferred to avoid more infected cases, until the health of passengers and crew members onboard could be ensured. This was a huge strike on the cruise shipping industry [2].

The restricted space and large mixture of people during cruise trips cause the initial reproduction rate of the virus onboard without countermeasures to be 4 times higher than the rate in Wuhan in early 2020, which was the epicenter of the COVID-19 outbreak at that time. Meanwhile, the transmission rate on cruise ships is the highest compared to any other transportation method [3]. In the COVID-19 pandemic, the cruise ship industry has been more severely affected than many other tourism and transportation industries and is unlikely to recover due to the travel restrictions and requirements onboard, such as physical distancing, which are difficult to be fulfilled [4]. In this situation, customers tend to avoid cruise service because of the health concerns on cruise ships during the journey [5]. From the short-term perspective, developing and implementing coronavirus-related health management is urgently required for resuming the cruise industry, protecting the health of passengers and crews, and attracting customers to choose cruise service again. From the long-term perspective, the health concerns onboard will have a permanent psychological impact on customers, and only a

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https://doi.org/10.1016/j.ijdrr.2022.102792

Received 4 April 2021; Received in revised form 12 December 2021; Accepted 7 January 2022

Available online 12 January 2022 2212-4209/© 2022 Elsevier Ltd. All rights reserved.

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complete and effective health management system onboard can solve their long-term concerns and motivate them to choose cruise service again when traveling. Therefore, the importance of health management on cruise ships should be prioritized.

After conducting the literature review, we found that a large number of studies have been conducted to study the management in the shipping or cruise service industry. The existing literature on managing cruise services can be mainly categorized into two streams. The first stream includes most of the studies, which focus on the marketing side of management, such as cruise brand experience, customer satisfaction, loyalty, and cruise marketing strategy [6–8]. Another stream has relatively fewer studies, which focus on the health and safety issues onboard. For instance, some researchers looked into people's reaction to health-related crisis onboard and their intention of protecting themselves [9,10], some examined the work-related injuries of crews during the voyages [11], and others studied the outbreaks of COVID-19 or other viruses on cruise ships [12,13]. However, there is a research gap whereby the existing literature lacks a focus on health crisis management strategies and the integration of the two streams of research (i.e., health crisis management and marketing).

The current study designs a series of strategies covering both marketing and health management that can be applied by cruise operators onboard during and post the COVID-19 pandemic, to improve the perceived value of cruise service and increase customers' intention of choosing cruise service when traveling.

To solve the gap in the research, this study integrates the following three theories to explain the relationships among various strategies and customers' intention to choose cruise service: social exchange theory, customers' perceived value theory, and trust theory. The theories are proposed to be crucial considering the COVID-19 pandemic. For instance, the social exchange theory suggests that individuals and organizations' decision into making a transaction or entering relationships with a service provider depends on the cost and reward. If rewards are higher than costs, a transaction or relationship shall occur [14]. For the cruise industry in the COVID-19 situation, the costs on customers can be the perceived health crisis and risks, and the possible time wastage and expenditures if they are infected during the trip. The rewards can be their enjoyment from the high-quality service and facilities during cruise trips. If customers think that they would obtain more rewards than costs during the journey, they will be willing to choose cruise service when traveling. According to social exchange literature, cost and rewards are influenced by relational bonding strategies, which include structural, social, and financial bonding strategies [15]. In this study, health management strategies are added to fit the current context due to the recent COVID-19 pandemic. From another theoretical lens, customers' perceived value theory proposes customers' stronger intention to purchase and use products and services if they possess high perceived value [16]. Value includes the following four dimensions: economic, functional, hedonic, and social values [17]. This study proposes that relational bonding strategies can enhance the perceived value of cruise services. Finally, trust theory refers trust as customers' confidence in a service or company [18]. In general, customers form greater confidence toward cruise operators who exhibit expertise, integrity, and benevolence [20]. Accordingly, this study proposes that a higher perceived value of cruise services can enhance customers' trust that consequently leads to improved customers' intention to use cruise services.

The rest of the paper is presented as follows. Section 2 presents the review of relevant theories and the purpose of the model to explain customers' expectations of cruise service. Section 3 introduces structural equation modeling (SEM) for data collection, organization, and analysis. Section 4 presents and discusses the results. Finally, Section 5 presents the conclusion of key findings and the recommendations for cruise operators about the policies and strategies that could be implemented onboard in the COVID-19 situation to attract more customers.

2. Literature review

2.1. Theory and model

This research applies three theories to examine and identify the most effective management strategies on cruise ships that motivate customers' intention to choose cruise service during and post the COVID-19 pandemic. This study proposes that customers would choose cruise service post COVID-19 if (1) cruise service brings larger customers' perceived value from applying relational bonding strategies, and (2) customers develop a high degree of trust or confidence in cruise service. Table 1 elaborates on these theories.

Following the explanation of the theories, this study developed a theoretical model shown in Fig. 1, which presents the strategies leading to customers' use intention for cruise services.

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Theory's characteristics	Social exchange theory	Customers' perceived value theory	Trust theory
Paradigm Basic Assumption	Relationship determination Relationships will continue only when rewards are larger than costs, otherwise will terminate.	Customer benefits Customers have a stronger intention to purchase and use products and services if they perceive higher value.	Social psychology Customers' intention to use cruise service can be increased by improving trust.
Representative Constructs	Rewards and Costs	Customers' Perceived Value	Customer Trust
Proposed Relationships	The theory can explain how the application of health management and marketing strategies onboard can increase the perceived value of cruise service by increasing rewards and reducing costs.	The theory can explain how value creation can increase customer intention to choose cruise service.	The theory can explain how the improvement of value can increase trust, which can motivate customers' intention of choosing cruise service.

This research applies three arguments to explain the interrelationships of the hypotheses shown in Fig. 1. The first argument is developed according to customers' perceived value theory. Value is the benefits and utility that the products and services can provide for customers; it consists of four dimensions, namely, economic, functional, hedonic, and social values [22]. The theory proposes the direct and considerable impact of the value of products and services on customer continuance intention and recommendation intention [16]. This explains the positive relationship between the value and customers' intention of choosing cruise service in the theoretical model, which indicates that if the application of the strategies can improve the value, it would motivate customer intention for cruise service (i.e., H_5).

The second argument is brought forward from the social exchange theory and the relational bonding strategies. The social exchange theory proposes that relationships between customers and service providers will continue and become closer if the rewards are larger than costs. By applying relational bonding strategies, cruise operators can provide service with higher quality and better enjoyment, and reduce customers' health risks during the trips from the structural (operational and health), social, and financial aspects [23]. Moreover, previous research has demonstrated the direct positive impact of relational bonding strategies on the improvement of customers' perceived value [24]. With the increase of rewards and reduction of costs, cruise trips will bring more benefits for customers, that is, raise the utility and value of the cruise service in economic, functional, hedonic, and social aspects (i.e., $H_1 - H_4$).

The last argument relates to the indirect impact of value on customer intention of choosing cruise service via trust. Previous research has clarified the positive link between value and trust, and the strong connection between trust and behavioral intentions [25]. Trust is a concept rooted in social psychology, which reflects customers' willingness to commit based on the competencies which can be measured according to the expertise, integrity, and benevolence of the service provider [26]. From this viewpoint, these three characteristics will improve customers' trust in the cruise industry and then their intention to choose cruise service (i.e., H_7). Therefore, increasing the value of cruise service can enhance customer trust in the cruise industry (i.e., H_6).

2.2. Effects of management strategies on customers' perceived value

Customers' perceived value can be defined as customers' overall assessment of benefits received from cruise service, which includes economic (i.e., financial savings), functional (i.e., service attributes), hedonic (i.e., emotional feelings), and social (i.e., social identity and acceptance) values [27]. Moreover, previous research has demonstrated that customers' perceived value can be increased by applying relational bonding strategies, which consist of social, structural, and financial bonding strategies [23,28,29]. Social strategies focus on interpersonal interaction to develop closer relationships with customers using social ties, such as celebrating special days with customers [30]. Financial strategies take advantage of monetary incentives like service discounts to attract customers with high utilitarian value [31]. Structural strategies emphasize functional and customized services, which can increase service efficiency, productivity, and quality [15]. To form a comprehensive management strategy system for the cruise industry in this special situation of COVID-19, the components of structural bonding strategies are quality management strategies and health management strategies, because health concerns have become an unignorable barrier. The effects of each strategy on the customers' perceived value of cruise service will be discussed in the following sections.

2.2.1. Effect of quality management strategies on customers' perceived value

The quality management strategies can be developed by influencing the physical environment, customer interactions, and



Fig. 1. Theoretical model.

performance outcomes [32]. The physical environment refers to the physical infrastructure and surroundings on the cruise ships, which plays an important role in customers' emotional feelings during the journey. Most passengers go on cruise trips for enjoyment and often spend more than one week onboard; hence, a convenient and satisfactory physical environment will significantly improve customers' hedonic value of cruise service [33]. The interaction quality is customers' assessment of staff service throughout the cruise experience. Moreover, it is essential for customers' evaluation of the overall cruise service. Interaction can be measured according to assurance, responsiveness, reliability, and empathy during cruise service delivery [34]. The outcome refers to the utility of onboard attributes that cruise trips bring to customers, which is a determining factor for customer decision-making. The existence of enter-tainment activities, core products and services, and other miscellaneous issues like policies for safety issues will increase the functional value and motivate customers to choose cruise service [35].

Therefore, improving the quality of the physical environment, interaction during service delivery, and outcomes of cruise service can increase the hedonic and functional value. Hence, the application of strategies developed according to these three aspects can help improve the quality management on board, and consequently increase the customers' perceived value.

H1. Quality management strategies have a positive effect on the customers' perceived value of cruise service.

2.2.2. Effect of health management strategies on customers' perceived value

The case and infection fatality ratios can be two times onboard compared to the ratios in the epicenter of the pandemic [36]. Moreover, viral transmission can happen for ambulatory patients during a relatively long period with minimal or no symptoms [37]. Thus, public concerns about the health issues of cruise ships have become a huge barrier for the customer to choose cruise service again during and after the COVID-19 pandemic. The health management strategies are designed to fulfill authority requirements for the cruise industry in the COVID-19 situation and guarantee customers' health and safety during cruise trips, which eventually will increase the functional value of cruise service. For example, recent research has confirmed that measures, such as facial masks, physical distancing, and eye protection, can effectively prevent the rapid spread of the virus, and then reduce the rate of person-to-person transmission among crowds [38]. Moreover, the European Maritime Safety Agency (EMSA) published the "COVID-19: EU Guidance for Cruise Ship Operations" in July 2020, which recommended the minimum requirements of measures implemented on cruise ships during and post the pandemic. The guidance includes health screening, use of personal protective equipment (PPE), cleaning and disinfection, and other shipboard operations [39]. With the application of these health management strategies onboard, the risk of a virus outbreak on cruise ships will decrease significantly, which allows passengers to have more interactions and enjoyment with each other and consequently increase the hedonic and social value.

Therefore, the implementation of health management strategies onboard can decrease customers' infection risks on cruise ships, improve the quality of their cruise experience, and eventually increase the customers' perceived value.

H2. Health management strategies have a positive effect on the customers' perceived value of cruise service.

2.2.3. Effect of social and communication strategies on customers' perceived value

The social bonding strategies can help build and motivate stable relationships with high relational quality among the involved parties, such as customers and cruise operators, from the feeling of identification, recognition, and familiarity [40]. For example, if the cruise operator organizes a group chat available for all customers who will go for the same cruise trip, these passengers can connect with others throughout the trip, which will increase the hedonic and social value of the cruise experience. The customer communication strategies aim to build, develop, and elevate sustainable relationships with target customers to maximize customers' perceived value and company incomes [41], involving advertising, convenience services like online customer service available for various languages, and relationship marketing [42]. For instance, cruise operators can apply innovative chatbots for their online service with customized and humorous answers for problem-solving, which will enhance the service quality by increasing communication quality, competency, accuracy, and credibility [43]. In this way, customers can receive useful information opportunely and get problems solved effectively and efficiently through satisfactory cruise service, and the functional value will be improved as well.

In conclusion, social and communication strategies can increase hedonic and social value by building and developing more stable and sustainable relationships among customers and cruise operators, and help provide more satisfactory and convenient services, which will improve the functional value. Therefore, the implementation of social and communication strategies can increase the customers' perceived value of cruise service.

H3. Social and communication strategies have a positive effect on the customers' perceived value of cruise service.

2.2.4. Effect of financial strategies on customers' perceived value

The financial strategies can occur as a competitive advantage of a company to provide services with lower prices but the same quality if the service provider can manage to use resources with higher effectiveness and efficiency [44]. Financial strategies include monetary financial incentives such as special price offerings and non-monetary time savings and are deemed the most convenient bond for competitors to achieve [45]. Moreover, financial strategies can motivate customers to engage in the relational exchange of cruise service if they can save money and receive rewards during service delivery [46]. For instance, cruise operators can offer higher discounts, free services, and privileges onboard for repeat customers, which will increase the economic value [47]. These measurements can encourage customers to choose cruise trips by providing incentives for purchasing cruise service, building closer relationships with customers, and offering motivators for repurchasing [48]. Furthermore, the hedonic value will also be increased because customers can save money or time during cruise service delivery, and they will feel satisfied for receiving more rewards and be willing to continue the relationship with cruise operators according to the social exchange theory. Lastly, if cruise companies use financial strategies to

decrease the price of anti-epidemic items onboard, such as personal protective equipment and hand sanitizers, the functional value of cruise service will be increased because the risks of infection during cruise trips will be reduced.

Therefore, although the financial strategies can be the easiest bonding strategies to be simulated by cruise operators, they can be the most effective strategies to attract customers to purchase cruise trips and increase the economic, hedonic, and functional value of cruise service.

H4. Financial strategies have a positive effect on the customers' perceived value of cruise service.

2.3. Direct effect of value on customers' intention for cruise service

According to the customers' perceived value theory, previous researchers have revealed that increasing customers' perceived values can improve customer behavioral intention, including purchase intention and recommendation intention [49]. More utility that cruise experience brings to customers may mean more subjectively positive assessments of behavioral intention [50]. For example, if cruise operators can provide cruise service with higher economic, hedonic, functional, and social value, customers will not only be willing to purchase and repurchase cruise service but also recommend cruise trip experience to people around them, which will bring positive and sustainable customer flows for the cruise industry. Moreover, based on the customers' perceived value creation framework, companies capable of providing cruise services with superior value for customers can maintain a more advantageous market position compared to their competitors [51]. With the more favorable market position and high-quality services, these cruise companies can acquire better brand attachment and distinctiveness from customers, and consequently, attract more intentions for their cruise business as well as keep high profitability [52].

Therefore, intentions for the cruise industry can be increased by improving hedonic, economic, functional, and social customers' perceived values. Furthermore, companies providing cruise service with a higher value can attract more intentions in the market.

H5. The value has a positive effect on customer intention for cruise service.

2.4. Indirect effect of value on customers' intention for cruise service

In the current research, trust is defined as the customer expectation that cruise operators will have trustworthy behavior instead of opportunistic behavior of taking advantage of customers' dependence and vulnerability [53]. Trust can be measured according to expertise (i.e., cruise operators' capability to accomplish promises for customers), integrity (i.e., cruise operators' behavior has high consistency, reliability, and honesty), benevolence (i.e., cruise operators' sincere concerns of putting customers' interest and welfare in the first place), competency (i.e., cruise operators' ability to provide successful and efficient service) [54], and reliability (i.e., cruise operators' trust worthiness and consistency of service quality) [55]. The definition of trust suggests that customers' trust in cruise service can be increased if (1) the utility of cruise service increases and (2) the vulnerability accepted by customers during cruise trips decreases. Due to the influence of the COVID-19 pandemic, this study focuses on customers' trust in the pandemic management of cruise companies. For brevity, customers' trust refers to the customers' trust in the pandemic management of cruise companies.

The elevation of customers' perceived value, which represents the net utility of application of the four categories of management strategies onboard, can increase the expected benefits of cruise service, and consequently improve customer trust in the cruise industry. For example, the implementation of health management strategies can raise the functional value and increase the utility of cruise service because customers' health and safety onboard can be further guaranteed. These benefits can provide more incentives for customers to trust cruise services. Meanwhile, the improvement of customers' perceived value can reduce the vulnerability accepted by customers during cruise trips and allow customers to trust in cruise service more. For instance, the application of social and communication management strategies can solve customers' problems efficiently and effectively, and help customers avoid unnecessary waste of money and time, which will improve the economic and functional value of cruise service. The prevention of waste and losses will decrease the vulnerability accepted by customers and increase their trust in the cruise industry.

Therefore, receiving cruise service with the expected value will augment the customer trust of cruise operators [56]. In addition, increasing customers' perceived value will improve customer trust in cruise service.

H6. The value has a positive effect on customer trust in the pandemic management of cruise companies.

According to the trust theory, raising customer trust will increase the intention of cruise service [57]. During and post the COVID-19 pandemic, the infection and health risks of traveling in limited spaces like cruise ships have been extremely high, causing a huge negative impact on customer intention for cruise service. To counter this uncertain and special situation, customers must form trust in the cruise industry, which can help develop and maintain sustainable customer–operator relationships in the long term and motivate customer's intention to choose cruise service [58]. For instance, if customers believe in the overall management quality of cruise service, and their health, safety, enjoyment can be guaranteed with reasonable expenditures during the cruise journey, they will have a positively increasing intention of purchasing and recommending cruise service.

Therefore, the elevation of customer trust will lead to increasing intention for cruise service.

H7. Customer trust in the pandemic management of cruise companies has a positive effect on customer intention for cruise service.

3. Methodology

Structural equation modeling is used to test the theoretical model and hypotheses in the current study. SEM is considered the most suitable method to analyze the relationships among the constructs because the latent constructs in the model are multidimensional. Three aspects will be covered in the consecutive subsections: (1) the measurement items for construct operationalization, (2) survey

Table 2

Constructs and measurement items.

Construct	ID	Measurement item	Adapted source
Quality Management Strategies (QM)		Not important at all (1)/Extremely important (9)	
	QM1	The physical environment onboard is well-arranged and clean (information counter, rooms, restaurants, etc.).	Chua et al. [33]; Haming et al. [19]
	QM2	The crews (ground staff and crews onboard) are well trained and professional with their jobs.	
	QM3	Cruise operators are always available for me to contact throughout the whole cruise trip.	
	QM4	Reasonable advice on trip arrangements is provided (time, price, activities to try onboard,	
		etc.) according to customers' travel needs.	
	QM5	Friendly and attentive services are provided throughout the trip.	
Health Management		Not important at all (1)/Extremely important (9)	
Strategies (HM)	UM1	Cruice operators reveal relevant information (the prevention measures, the protocols related	EMEA [20]
	LIMI I	to repetriation and disembarkation in case of an outbreak, etc.) from pre-boarding to	EWISA [39]
		disembarkation	
	HM2	Cruise operators use floor markings to help passengers maintain physical distance and	
	111112	require staff members to interact with passengers at fixed locations with protective barriers.	
	HM3	A health monitoring system is established on board, which will be used from the pre-	
		boarding area to disembarkation.	
	HM4	Sufficient stocks of Personal Protective Equipment (PPE) are carried on board.	
	HM5	Cruise operators have the plan defining for each space of the ship, the frequency of cleaning	
		and disinfection, and the appropriate products and techniques to be used.	
	HM6	Cruise operators stay in contact with the local public health authorities in the relevant ports	
		to obtain up-to-date information on the level of transmission risk and on what local	
		measures are in place and to communicate this to all persons (passengers and crew)	
		disembarking.	
	HM7	Evacuation drills are organized with passengers and crews.	
	HM8	Proper maintenance and Covid-19 related revisions are applied to the Heating, Ventilation	
		and Air Conditioning systems (HVAC) onboard, to increase the number of air exchanges per	
Cosial and Communication		hour reducing the risk of transmission in closed spaces.	
Social and Communication		Not important at all (1)/Extremely important (9)	
Strategies (SC)	SC1	Mobile app services are available for purchasing tickets, ordering meals, checking	Ocarenkhoe and
	301	timetables available slots and rooms etc	Bennani [50]
	SC2	Attractive official websites clearly show all the services activities discounts etc.	Definition [37]
	SC3	Live chat services are available for answering customers' questions anytime in several	
		languages.	
	SC4	Physical tickets can be delivered if needed, and digital tickets are also accepted when	
		boarding.	
	SC5	Cruise operators organize group chats or chat rooms for customers who are going on the	
		same trip, which can help customers to know each other and make friends before the trip	
		begins if they want.	
Financial Strategies (FS)		Not important at all (1)/Extremely important (9)	
	FS1	Cruise operators provide members with loyalty points, which can then be used for	Balci et al. Balci et al.
	700	redeeming gifts and vouchers.	[15]
	FS2	Cruise operators offer seasonal discounts on tickets.	
	F83	Cruise operators provide members with privileges onboard, such as special events and free	
	FS4	incurrence. If the same product was sold for a lower price by the same cruise at a later date, the	Lieberman [60]
	1.34	difference will be refunded to customers who booked earlier	
	FS5	Customers can purchase cruise and shore tours of the ports of call and destinations as	
	- 50	integrated packages, which can help them save money.	
Trust (TR)		Strongly disagree (1)/Strongly agree (9)	
	TR1	I believe that the health management of cruise operators is effective and sustainable.	Yuen et al. [54]
	TR2	I believe that cruise operators are knowledgeable concerning 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.	Marca et al FEED
	TR5	My trust in cruise services will be based on the reliability of the safety measures of cruise	Yuen et al. [55]
Value (VA)		operators.	
value (VA)	17 4 1	Strongry utsagree (1)/Strongry agree (9)	Vuon ot al [17]
	VA1 VA2	I think cruise thips are reasonably priced. I feel that my health and safety can be ensured during my cruise trip	
	VAZ VA2	I feel that cruise trips are good for my mental and physical health	
	VA3	I feel that cruise services are pleasant.	
	VA5		Han and Hvun [21]
			(continued on
			(conunueu on next page)

Table 2 (continued)

Construct	ID	Measurement item	Adapted source
Intention (IN)	IN1 IN2 IN3 IN4 IN5	Compared to the time and effort I spend on cruise services, I believe I will receive good value. Strongly disagree (1)/Strongly agree (9) I intend to use cruise services post COVID-19. I consider using cruise services to be my first choice for my travel needs post COVID-19. My intention to use cruise services for the next holiday trip post COVID-19 is likely. I would recommend cruise trips to my friends post COVID-19. I will say positive things about cruise services post COVID-19 to my friends.	Zhao et al. [61] Yuen et al. [17]

design and administration processes, and (3) the demographic profile of respondents.

3.1. Measurement items

For the operationalization of constructs (i.e., quality management strategies, health management strategies, social and communication strategies, financial strategies, trust, value, and customers' intention to use cruise service post COVID-19 pandemic) in the theoretical model, the corresponding measurement items are developed by referring to the literature (Table 2).

Quality management strategies are defined as service strategies that cruise operators implement onboard to help improve customer experience during cruise trips, which include three dimensions concerning the physical environment, interactions, and outcome [32]. Physical environment refers to the facilities and surroundings onboard; meanwhile, interactions examine staff service during cruise trips based on customer experience, and outcome relates to the benefits customers received from cruise trips.

Health management strategies are defined as health-related strategies and policies applied during cruise trips to avoid virus outbreak onboard and guarantee customer health post COVID-19 pandemic. According to the "COVID-19: EU Guidance for Cruise Ship Operations" [39], mainly eight dimensions are mentioned in the measurement of health management strategies (i.e., information and communication, physical distancing, health screening, use of personal protective equipment, cleaning and disinfection, persons going ashore and re-embarking, emergency procedures, and the heating, ventilation and air conditioning systems (HVAC)).

Social and communication strategies are defined as strategies implemented to improve relational quality between customers and cruise operators by providing customers with identification, recognition, and familiarity [40]. The measurement of social and communication strategies consists of five dimensions, which are system, scheme, staff, structure, and style [59]. The system refers to the innovations of online service platforms of cruise operators, the scheme relates to the operators' marketing strategies, the staff is about all the service provided by cruise personnel throughout cruise trips, the structure covers different service forms available for customers, and style looks into the service philosophy and culture of cruise operators.

Financial strategies are defined as the economic attractants provided by cruise operators as their competitive advantages. Five dimensions are applied for measuring financial strategies: loyalty points, discount, privilege, lowest price guarantee, and integrated package [15,60]. By earning loyalty points, members can enjoy extra discounts and privileges during cruise trips. Also, seasonal discounts and the lowest price guarantee (i.e., refund price difference to customers if tickets become cheaper in the future) are available for all customers to motivate them to use cruise service. The integrated package refers to the promotion strategy in which customers can enjoy low prices by purchasing shore tours and cruise trips as combinations.

Trust is defined as customers' belief in the trustworthy behavior of cruise operators [53]. The measurement of trust contains five dimensions, which are competency, expertise, benevolence, integrity [54], and reliability [55]. Competency is the capability of cruise operators to serve customers successfully and efficiently. Expertise refers to customers' belief in operators' professional skills to provide satisfactory services during cruise trips. Benevolence is related to operators' motivation that they care about customer benefits more than their interests. Integrity covers the sustainability of operators' values and behavior, as well as their moral principle of fairness. Reliability is about the trustworthiness of operators, and their ability to serve consistently well.

Value is defined as the benefits and utility that customers receive from cruise service, including economic (i.e., price attractiveness and fairness), functional (i.e., the performance of cruise operators' service), hedonic (i.e., customers' positive experience during cruise trips), and social values (i.e., positive externalities of using cruise service) [22]. This study focuses on the cruise service post COVID-19 pandemic; thus, an additional dimension of health and safety value is added to the measurement, which is defined as operators' guarantee on customer health and safety when using cruise service.

Finally, customers' intention is defined as customers' willingness and plans to use cruise service post COVID-19 pandemic. Five commonly applied measurement items in previous studies are used to operationalize the intention [17,61]. The first three measurement items refer to the behavioral intentions of customers to use cruise service post COVID-19 in the next traveling trip. The other two items are related to the attitudinal intentions of customers to recommend and give positive comments on cruise services post COVID-19 pandemic.

A 9-point Likert scale (i.e., "1" equals unimportant at all and "9" equals extremely important) is used for quality management strategies, health management strategies, social and communication strategies, and financial strategies. In addition, a nine-point Likert scale (i.e., "1" equals strongly disagree and "9" equals strongly agree) is used for trust, value, and intention.

3.2. Survey design and administration

The adopted and adapted measurement items are combined into a questionnaire to collect survey data for the current study. The questionnaire is composed of three sections. The first section presents an introduction of our research, a description of the current

unoptimistic situation of the cruise industry during the COVID-19 pandemic, and an explanation of the objectives of the survey. The following section consists of demographic questions, and the last section involves the measurement items shown in Table 2. Before sending the questionnaire officially, 5 people randomly picked from the public were invited to conduct the survey. All of them indicated that the introductions, as well as the questions, are clearly described, which no longer requires further explanation. Moreover, the survey assures the anonymity of respondents.

The questionnaire was administered mainly to the residents in China because China had the second-largest customer group in the cruise industry in 2018 following the United States [62]. Moreover, China has been implementing comprehensive and strict safety precautions since the start of COVID-19 pandemic, which allows Chinese residents to have a clear understanding of the situation on cruise ships with the application of safety precautions. To ensure the respondents living in China can understand the questionnaire without confusion, as well as the accuracy of the survey, the original English version was translated into Chinese and back-translated into English by two different translators. After the survey questions were examined by a professional translator, both English versions were compared to note discrepancies, and adjustments were made to the Chinese version based on the suggestions of the translator. The final Chinese version was published on a professional survey website called Wen Juan Xing (www.wjx.cn). Furthermore, after evaluating and comparing different channels (e.g., Instagram, Facebook, Weibo, WeChat Moments, other online questionnaire survey platforms etc.), the questionnaire link was shared in WeChat tourism groups via travel agencies in the urban coastal areas in China to ensure the representativeness of the samples received and avoid the limits of the researchers' own social circles. Also, an e-voucher was attached to the survey for whoever finished the questionnaire. Using cruise service has no limitations; hence, people of all ages and from all backgrounds are eligible to participate in the survey.

The questionnaire link was available for around six weeks from December 2020 to January 2021. In total, 603 completed questionnaires were received. All the responses were required to pass the validation test to be qualified (i.e., answer three attention check questions, including attention filter, trap question, and reverse question). After conducting the validation test, 376 responses were valid and further analyzed.

Table 3

Confirmatory factor analysis results.

Construct	Item	λ	AVE	CR
Quality Management Strategies (QM)	QM1	0.847	0.728	0.930
	QM2	0.879		
	QM3	0.782		
	QM4	0.847		
	QM5	0.905		
Health Management Strategies (HM)	HM1	0.856	0.789	0.967
	HM2	0.813		
	HM3	0.927		
	HM4	0.925		
	HM5	0.933		
	HM6	0.949		
	HM7	0.784		
	HM8	0.890		
Social and Communication Strategies (SC)	SC1	0.829	0.663	0.908
	SC2	0.831		
	SC3	0.844		
	SC4	0.830		
	SC5	0.733		
Financial Strategies (FS)	FS1	0.783	0.667	0.909
	FS2	0.854		
	FS3	0.837		
	FS4	0.773		
	FS5	0.832		
Trust (TR)	TR1	0.819	0.685	0.915
	TR2	0.887		
	TR3	0.906		
	TR4	0.730		
	TR5	0.785		
Value (VA)	VA1	0.735	0.664	0.908
	VA2	0.749		
	VA3	0.861		
	VA4	0.858		
	VA5	0.860		
Intention (IN)	IN1	0.804	0.792	0.950
	IN2	0.902		
	IN3	0.924		
	IN4	0.938		
	IN5	0.876		

Note: Model fit indices: $\chi^2/df = 2.02$, (p < 0.05); CFI = 0.974; TLI = 0.969; RMSEA = 0.054; SRMR = 0.056.

3.3. Profile of respondents

According to the data analysis, the proportion of respondents' genders was 48.94%–51.06% for the male to female, which is fairly even and similar to the male to female ratio of the total population in China (i.e., 105.30 males per 100 females) in 2020.

As for the respondents' ages, around 57% of the respondents are younger than 40 years old, which is a bit higher than the statistic of 51% in 2020 [63]. The marginal dissimilarity is reasonable because the questionnaire was distributed via online channels, which can lead to a slightly higher proportion of young generations participating in the survey. Regarding the monthly income, the average amounts to 10,715.25 CNY, which is higher than the average salary in China in 2019 (i.e., 7541.75 CNY) [64]. The difference is understandable because most respondents who live and work in the urban areas in China are more likely to use cruise services. Concerning the educational level, over 70% of the respondents have undergraduate and graduate education experience, which has consistency with the data of 77% from the World Education Services (WES) [65]. Moreover, nearly 30% of the respondents have used cruise service before. Since the factor 'experience' has been tested to be a non-significant control variable in the theoretical model and t-tests have been conducted to prove that there is no non-response bias (i.e., no difference between responses from the participation and non-participation groups) in the survey, respondents' past experience of using cruise service will not affect their responses in the survey. Finally, half of the respondents live in a residential area with cruise ports and terminals (i.e., 50.27% have cruise ports and terminals in their residential area, whereas 49.73% do not have them). The almost equal proportions provide a more balanced view on the usage of cruise services, which is extremely desirable because the equal subcategories of respondents will indicate the distinctions in their responses obviously [66]. These statistics provide some assurance that the sample is representative of the Chinese population.

4. Results and discussion

Three subsections will be discussed in this section: (1) the overall model fit, (2) the structural model analysis, and (3) total effect analysis.

4.1. Measurement model analysis

The measurement model's overall fit was examined by conducting the confirmatory factor analysis. The standardized factor loadings (λ), average variance extracted (AVE), and composite reliability (CR) of the constructs are presented in Table 3.

The measurement model fit indices are shown in Table 3, including the result of chi-square divided by the degrees of freedom χ^2/df = 2.02 (p < 0.05), comparative fit index (CFI) = 0.974, Tucker–Lewis index (TLI) = 0.969, root mean square error of approximation (RMSEA) = 0.054, and standardized root mean square residual (SRMR) = 0.056. All the values satisfy the minimum requirements specified by Hu and Bentler [67]; indicating a satisfactory model fit.

The CR values of the constructs indicate the items' reliability. In the survey, all the CRs are above the cut-off criteria of 0.70 (i.e., between 0.908 and 0.967), which suggests a high internal consistency [17].

Validity is measured by both convergent validity and discriminant validity. The constructs' AVE, correlation, and squared correlation values are presented in Table 4. AVEs are above the acceptable threshold of 0.50 [68], and all AVE values of the construct pairs are higher than the squared correlations, confirming convergent and discriminant validity.

Common method bias can impact the result validity because survey data were collected from a homogenous source, that is, the Chinese population, which may exhibit a high degree of acquiescence. Harman's single factor test using principal component analysis was used to check the common method bias, and to examine whether the proportion of single factors' contribution in the measurement model variance is larger than 50% [69]. After loading the measurement items onto a single factor, the variance was tested to be around 38%, indicating the little influence of common method bias on the results.

Moreover, since the questionnaire was distributed only via online channels, the possible acquiescence and altruism of responses may lead to non-response bias, which can also affect the validity of the survey results. The extrapolation approach was used to examine the non-response bias – to compare the differences between responses from the early and late respondents, assuming that the late or less ready responses have a higher possibility to be non-responses [70]. T-tests were applied to compare the measures' means of the first 50% and last 50% responses and no significant differences were discovered, suggesting no non-response bias in the survey results.

Overall, the data analysis results indicate an adequate fit of the measurement model and the reliability and validity of the measurement items. Moreover, the common method bias and the non-response bias have little impact on the survey results. Therefore, the formal testing of the structural model can proceed.

Та	ble	4
10	DIC	-

AVE,	correlations	and	squared	correlations	of	the	constructs.
------	--------------	-----	---------	--------------	----	-----	-------------

QM HM SC FS TR VA	IN 0.018
	0.018
QM 0.728 0.542 0.420 0.342 0.011 0.152	
HM 0.789 0.484 0.334 0.015 0.227	0.014
SC 0.663 0.407 0.008 0.220	0.012
FS 0.667 0.023 0.236	0.001
TR 0.685 0.480	0.257
VA 0.664	0.378
IN	0.792

a AVEs are on the main diagonal.

b Squared correlations are above the main diagonal.

4.2. Structural model analysis

The standardized estimated correlations among the constructs and the corresponding squared multiple correlations (R^2) are presented in Fig. 2. Also, the control variables (i.e., experience, age, and education) are included to examine their influence on customers' use intention for cruise service post COVID-19 pandemic.

In general, a good model fit is supported by the model fit indices. In addition, the squared multiple correlations (R^2) are close to or larger than 0.50, the exogenous variables, which support a good model fit.

As shown in Fig. 2, all four of the relational bonding strategies' components (i.e., quality management, health management, social and communication, and financial strategies) have significant, positive effects on value, whose standardized effects are 0.218, 0.375, 0.319, and 0.408 accordingly. Therefore, H_1 – H_4 are all accepted. These four constructs explain 70.1% of the variance in value ($R^2 = 0.701$). Overall, these outcomes are coherent with the arguments in this study that the perceived value of cruise service will be created by implementing the relational bonding strategies during cruise trips.

According to the social exchange theory, customers are willing to use cruise service and maintain their relationships with cruise operators only when cruise experience can provide customers with more rewards compared to costs. In particular, the creation of value in cruise service is due to the increase of rewards for customers from the strategies. For example, the application of quality management strategies will increase customers' hedonic and functional value by improving the physical environment (i.e., infrastructures and surroundings on cruise ships), service interaction (i.e., customers' assessment of staff service), and outcomes (i.e., utility and benefits of cruise experience) during cruise trips [71]. Moreover, the implementation of health management strategies (i.e., policies designed for the pandemic) allows customers to enjoy smooth cruise trips, helps guarantee customer health and safety, and reduces customers' concerns about getting infected post COVID-19 pandemic, which increase the functional, hedonic, and social value of cruise service. Moreover, the social and communication strategies can increase customers' feeling of identification, recognition, and familiarity [40], which will improve the hedonic, social, and functional value of cruise service. Eventually, both monetary (e.g., discounts and special price offering) and non-monetary (e.g., time savings) incentives of the financial strategies [45] can increase the economic, hedonic, and functional value of cruise service. The results indicate the creation of and increase in the value of cruise service by implementing various strategies, which can improve the overall attractiveness and quality of cruise experience.

Fig. 2 also presents the significant and direct effect of value on customer intention for cruise service (b = 0.521, p < 0.05). Therefore, H₅ is accepted. According to the customers' perceived value theory, customer intention of using cruise service will increase with a higher value of cruise experience, including hedonic (i.e., customer feelings), economic (i.e., financial savings), social (i.e., social identity and acceptance), and functional (i.e., service attributes) values [27]. The increase in values motivates customer intention to use cruise service post COVID-19 pandemic.

Moreover, value has a positive and direct effect on customer trust in cruise service (b = 0.615, p < 0.05), and trust also has a positive and direct effect on customer intention (b = 0.235, p < 0.05), which indicates an indirect effect of value on customer intention for cruise service. Therefore, H₆ and H₇ are accepted. The positive relationship between value and trust is consistent with customers'



Fig. 2. Parameter estimation of the proposed model. *Note:* * indicates that the path estimate is significant (p < 0.05); Model fit indices: $\chi^2/df = 2.23$, (p < 0.05); CFI = 0.969; TLI = 0.962; RMSEA = 0.062; SRMR = 0.070.

perceived value theory and trust theory, which posit that increasing value can create customer trust in cruise service if cruise operators exhibit expertise (i.e., the capability of promise accomplishment), integrity (i.e., high consistency, reliability, and honesty of behavior), and benevolence (i.e., concerning customer interest and welfare as the most important) [72]. Here, value acts as an essential antecedent for trust because it reflects customers' assessments of cruise operators' expertise (e.g., through quality and health management strategies), integrity (e.g., through quality, health, and financial strategies), as well as benevolence (e.g., through health management, social and communication, and financial strategies). According to the data analysis, the value explains 51.1% of the variance in customer trust ($R^2 = 0.511$), which emphasizes the importance of value in influencing customer trust.

Including the control variables, value and trust together explain about 50% of the variance in customer intention for cruise service $(R^2 = 0.492)$. The standardized effects of "experience," "age," and "education" are 0.074 (p > 0.05), 0.040 (p > 0.05), and 0.065 (p > 0.05) respectively, and all of them are not significant on customer intention. Surprisingly, respondents' experience (i.e., whether he or she has used cruise service before) is not significant because the former customers of cruise service post COVID-19 pandemic. To further determine if there are significant differences in the responses of the two groups of respondents (those with and without cruise experience), *t*-tests are conducted to compare the means of all latent constructs. The results are not significant. This suggests that the responses can be aggregated since there are no significant differences in the responses between both groups. The elderly people are easier to be infected by the coronavirus [73]; hence, this vulnerable group would be more cautious about traveling post COVID-19 pandemic, especially high-risk places like cruise ships [36]. Therefore, the finding that "age" is not significant is also surprising. However, the insignificance of "education" is not surprising because the people living in China are aware of the strict and effective precautions during the pandemic. In this situation, they can understand the results of the precautions implemented during cruise trips regardless of their educational level. Nevertheless, the insignificant results suggest that the latent constructs proposed in these studies are stronger predictors of customers' intention compared to demographic profile.

4.3. Total effect analysis

The direct, indirect, and total effects of the constructs are presented in Table 5.

As for direct effects, the exogenous variables of value are financial strategies ($a_{41} = 0.408$), health management strategies ($a_{21} = 0.375$), social and communication strategies ($a_{31} = 0.319$), and quality management strategies ($a_{11} = 0.218$) in decreasing order. The only direct predictor of trust is value ($a_{52} = 0.615$). In addition, the two direct predictors of customer intention in decreasing order are value ($a_{53} = 0.521$) and trust ($a_{63} = 0.235$).

For indirect effects on trust, financial strategies ($b_{42} = 0.251$) and health management strategies ($b_{22} = 0.231$) are the most effective for the increase in customer trust, followed by social and communication strategies ($b_{32} = 0.196$) and quality management strategies ($b_{12} = 0.134$). Moreover, the indirect effects of the four relational bonding strategy components on customer intention for cruise service are fully mediated by value and partially mediated by trust (Fig. 2).

For the total effects, value ($c_{53} = 0.666$) is the most influential predictor of intention, followed by financial strategies ($c_{43} = 0.272$), health management strategies ($c_{23} = 0.250$), trust ($c_{63} = 0.235$), social and communication strategies ($c_{33} = 0.212$), and eventually quality management strategies ($c_{13} = 0.145$). The ranking indicates that for the relational bonding components, people pay more attention to the financial strategies and health management strategies post COVID-19 pandemic. In addition, customer intention for cruise service can significantly increase when the value of cruise experience is created through implementing relational bonding strategies.

Table 5

Direct, indirect and total effects.

F(i)			
Exogenous (i)	Value (1)	Trust (2)	Intention (3)
Direct effects (a _{ij}) of			
Quality management strategies (1)	0.218	_	-
Health management strategies (2)	0.375	_	-
Social and communication strategies (3)	0.319	_	-
Financial strategies (4)	0.408	_	-
Value (5)	-	0.615	0.521
Trust (6)	_	_	0.235
Indirect effects (b _{ij}) of			
Quality management strategies (1)	_	0.134	0.145
Health management strategies (2)	_	0.231	0.250
Social and communication strategies (3)	_	0.196	0.212
Financial strategies (4)	-	0.251	0.272
Value (5)	-	_	0.145
Trust (6)	-	-	-
Total effects (c _{ij}) of			
Quality management strategies (1)	0.218	0.134	0.145
Health management strategies (2)	0.375	0.231	0.250
Social and communication strategies (3)	0.319	0.196	0.212
Financial strategies (4)	0.408	0.251	0.272
Value (5)	_	0.615	0.666
Trust (6)	_	-	0.235

5. Conclusion

5.1. Theoretical contribution

This study aims to design a series of strategies that can be implemented onboard to increase value and customer's use intention for cruise service post COVID-19. Three theories are synthesized and used to examine and explain the influence of factors on customer intention, namely, social exchange theory, customers' perceived value theory, and trust theory. The combination of these theories provides a unique insight into explaining customers' intention to use cruise services post COVID-19, as well as enhances the social exchange theory and relational bonding strategies with the incorporation of health management strategies.

Moreover, a nomological structure has been established in the theoretical model, which examines the mediation relationships among the factors – customers' perceived value serves as the full mediator between the relational bonding strategies and customers' intention to use cruise service post COVID-19, while trust is the partial mediator between customers' perceived value and intention.

In addition, this study introduces health management strategies as part of the relational bonding strategies, which fills the research gap concerning the lack of a combination of health management and classical relational bonding strategies for enhancing customer intention to use cruise services. Customers' concerns about health issues will increase during cruise trips post COVID-19 pandemic; therefore, the combined strategy series shall be essential for the revitalization of the cruise industry.

This study also contributes to the creation of a new latent construct (i.e., trust in pandemic management), which reflects customers' trust in the capability of the cruise companies in managing and implementing health, safety measures onboard cruise ships. This construct has been demonstrated to be an effective determinant of customers' intention to use cruise service post COVID-19. It is also influenced by the perceived value of customers.

Furthermore, the total effect analysis indicates the major impact of value on intention, as well as the relative importance of the theories in explaining customer intention to use cruise services post COVID-19 (i.e., customers' perceived value theory has the most significant impact, followed by relational bonding strategies, and finally, trust theory). These findings provide valuable recommendations for cruise operators. They should prioritize increasing customer rewards (i.e., customers' enjoyment from the high-quality service and facilities during cruise trips) to improve customer's use intention for cruise service. Moreover, they can spend more effort on financial and health management strategies because they have a larger influence compared to other relational bonding strategies as well as trust in pandemic management.

5.2. Policy and strategy implications

This study provides suggestions of applicable policies and strategies for policymakers and cruise operators to increase customer intention for cruise service post COVID-19 pandemic.

Based on the rankings of total effects, value has the most significant impact on customers' intention to use cruise services post COVID-19. In other orders, customers will be more willing to use cruise service after the pandemic if policy makers and cruise operators can provide higher value (i.e., customers' overall assessment of benefits) for cruise trips. To attract more potential customers to use cruise services post COVID-19, policymakers can provide residents and tourists with cruise vouchers together with corresponding hotel, shore tour, and attraction vouchers (economic value). Furthermore, they can publicly recommend cruise companies with outstanding social contributions (e.g., donate to support hospitals and communities) or performance (e.g., follow government instructions and implement effective precautions) in the pandemic (social value). On the other hand, cruise operators should apply the precautions seriously to avoid virus outbreaks onboard (e.g., all the customers and staff should submit negative viral test results within 48 h before boarding, maintain safe distancing during cruise trips, etc.) and provide high-quality services (e.g., stable and high-speed Wi-Fi onboard, efficient and effective service available when needed, etc.) (functional value). Moreover, for customer experience, cruise operators should try ensuring normal activities on board to create or maintain excitement (e.g., sports facilities and entertainment activities, such as swimming pools and live shows, can be enjoyed as usual during cruise trips) (hedonic value).

Customers' trust in pandemic management will also affect their intention to use cruise service post COVID-19 pandemic. Cruise operators should provide timely and helpful service to meet customer needs (competency), exhibit their capability (e.g., well-arranged order when boarding) to reassure customers (expertise), care about customer's health (e.g., equipped with a professional medical team onboard to cope with emergencies) and even return to port when necessary (benevolence), treat every customer with equal courtesy regardless of their ticket tier (integrity), and ensure customer safety in all circumstances (reliability). This will allow customers to perceive cruise operators as more trustworthy, which will motivate their use intention for cruise service.

Meanwhile, the financial strategies have the most significant impact on customer intention to use cruise services post COVID-19 among the relational bonding strategies. The results suggest customers' greater willingness to use cruise service if cruise operators offer huge seasonal discounts, provide extra special service and privilege (e.g., free Wi-Fi, massage, exclusive cinema, etc.) for the members with higher loyalty points, and communicate with local travel agencies to offer cost-effective integrated packages of cruise trips and shore tours. Additionally, the lowest price guarantee scheme (i.e., the price difference will be refunded to customers who booked cruise tickets for the same cruise trip earlier if the ticket price decreases later) will also help cruise operators attract more customers post COVID-19.

Health management strategies are demonstrated to be the second most influential relational bonding strategies for customer intention of using cruise service, which emphasizes the increasing health concerns of customers post COVID-19 pandemic. To ease customers' worries, cruise operators should implement strict and effective precautions before, during, and even after cruise trips. For example, customers and staff should conduct serologic testing for IgM against SARS-CoV-2 and upload their negative test reports, which will be checked by cruise operators before boarding. In addition, cruise operators should continue reviewing the relevant information about the prevention measures and the protocols of repatriation and disembarkation in a possible virus outbreak onboard

during the entire cruise trips (i.e., from pre-boarding to disembarkation). During cruise trips, cruise operators should ensure that everyone onboard follows the precautions and wears personal protective equipment, such as masks, in public places. The cleaning and disinfection frequencies for each space category on the ship and the corresponding products and techniques used should be planned and monitored by the cruise operators, which can protect customers from being infected onboard. Moreover, a health monitoring system should be established onboard and used during the entire trip (e.g., temperatures should be taken periodically to discover any possible infected cases without delay). At the end of cruise trips, cruise operators should ensure the complete cleaning and disinfection of the cruise ship's internal environment, and report customers' health conditions to the local health authorities and relevant government departments in the destination. With effective health management strategies, customers will be less concerned and enjoy more during cruise trips.

The implementation of social and communication strategies will help increase customer intention for cruise service. Cruise operators can give customers souvenirs with customer names on them (identification) to express their appreciation of customer's willingness to support the cruise industry post COVID-19 pandemic (recognition). Moreover, operators can organize chat groups for customers before trips, which allows them to get familiar and make friends with each other in advance (familiarity). Additionally, cruise operators can develop mobile app services for customers (e.g., purchase tickets, order meals and rooms, check schedules and available slots, 24/7 live chat services in several languages, etc.), which will make the cruise trips more convenient and enjoyable and increase customers' intention to use cruise services post COVID-19.

Lastly, the quality management strategies will also influence customer intention for cruise service. Customers will be motivated to use cruise service post COVID-19 pandemic if cruise operators can decorate and arrange cruise ships with useful and attractive facilities (e.g., easily found information counters, comfortable rooms, clean restaurants, etc.) (physical environment), provide thoughtful service when dealing with customer problems (e.g., reasonable advice for trip arrangements according to customer needs, such as time, price, and entertainment activities onboard) (interactions), and bring pleasant and meaningful experience (e.g., well-trained ground staff and professional crews onboard providing timely and effective solutions) (outcomes).

5.3. Limitations and recommendations

Although contributions have been achieved, this study has some limitations. For instance, the survey was conducted online, which only provides people exploring the internet the opportunity to obtain the questionnaire links. This could result in an unbalance among different ages, and the opinions of the elderly may not be included in this study. Future studies could randomly invite respondents with paper questionnaires after the COVID-19 pandemic to ensure the balance among different ages. Moreover, future studies can conduct research with a higher proportion of residents with participation experience in cruise service post COVID-19 pandemic, which can further ensure the randomness and accuracy of the results.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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