



Exploring the drivers of COVID-19 protective behaviors among Singaporean tourists to Indonesia using travel bubbles

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Accepted: 8 August 2022

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Abstract

This study investigates the relationships among positive emotions, perceived threats, protection motivation, coronavirus disease 2019 (COVID-19) vaccination intentions, quarantine-free travel intentions and COVID-19 protective behaviors in the context of quarantine-free travel. Data were collected from Singaporean tourists in Batam and Bintan of Indonesia using travel bubbles. A total of 387 respondents completed the questionnaires. The findings can help tourism managers create and implement market-driven service initiatives to increase positive emotions, protection motivation, and intentions to take quarantine-free travel and decrease perceived threats in order to enable tourists to have accurate COVID-19 protective behaviors.

Keywords Perceived threats · COVID-19 vaccination intentions · Quarantine-free travel intentions · COVID-19 protective behaviors · Travel bubbles

Introduction

A number of countries are contemplating the feasibility and possibility of initiating travel bubbles as a result of the COVID-19 and the constraints of tourism. The term “travel bubbles” are agreements among the countries that have overcome COVID-19, in which residents living within the bubble are able to travel without being subject to mandatory self-quarantine (Chen & Kitingern, 2020). A travel bubble was firstly initiated by Latvia, Lithuania and Estonia, where the residents from the surrounding countries were permitted to enter each country with no quarantine measures. In contrast, the outsiders were obliged to take 14 days of quarantine (Reuters, 2020). Travel bubble destinations are initiated

and introduced to citizens by several countries to stimulate the national economies in the current stage of the pandemic (Leung, 2020). Although the travel ban limits international tourism mobility, it results in more local tourism flows that affect local traffic, residents, businesses and carbon emissions per capita (Jaquinto, 2020).

The travel bubble is attracting attention as an alternative to recover the international tourism business amid the pandemic, but pragmatic research has not yet commenced. On January 24, 2022, Singapore reopened its border and resumed quarantine-free travel with the neighboring Indonesian islands of Bintan and Batam. It is believed that the travel bubble plans, which are open to fully vaccinated tourists, will stimulate the economy, especially boosting the tourism sector. The policy is also applied to passengers traveling by ship between Singapore and Bintan Telani Port, as well as the Nongsapura Ferry Terminal in Batam (Aditya, 2022). Protective behaviors, involving preventive (e.g., disinfectants, mask-wearing), avoidant (e.g., avoiding public places, stringent quarantine), and management of disease-related behaviors (e.g., paying for preventive medication or therapeutic care and obtaining professional protection/ treatment) (Bish & Michie, 2010), are considered to be the responses. One crucial question that needs investigation is how these protective measures can persuade tourists to practice the suggested COVID-19 prevention measures. However, it is unclear how to identify

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which factors are the drivers and how these factors are related to tourists' protective behaviors under COVID-19 (COVID-19 Information, 2021; Dai et al., 2020). Therefore, it is worth investigating relevant factors influencing COVID-19 protective behaviors in the tourism industry.

Chen et al. (2020) propose that the visit of a particular tourist destination can lead to positive emotions; thus, the management of tourist destinations should focus on inducing tourists' positive emotions. In addition, they develop two dimensions of positive emotions: emotional spark and flow. Perceived threat is a two-dimensional cognitive construct that includes perceived vulnerability and the perceived severity of the threat (Itani & Hollebeek, 2021; Nahar et al., 2013). Tourists with higher positive emotions are more likely to perceive higher threats, especially when the issue concerns quarantine-free travel (Qiao et al., 2022). Ashida et al. (2011) propose that protection motivation depends on how one perceives the possible responses for coping with that threat (for example, performing safe tractor operation behaviors). Ansari-Moghaddam et al. (2021) present that the protection motivation construct is useful in predicting COVID-19 vaccination intentions. According to Gursoy et al. (2021), COVID-19 vaccination intentions increase travel intentions in the long term. The World Health Organization (2020) announces numerous COVID-19 protective behaviors, including mask-wearing, keeping social distancing and hand hygiene. These actions and behaviors, which aim to ensure a person's safety and protect them from viral infection should be considered prosocial behaviors (Dinić & Bodroža, 2021; Williams et al., 2022). Yazdanpanah et al. (2020) indicate that travel intentions are an antecedent of COVID-19 protective behaviors. Bae and Chang (2021) propose that tourists who perceive high levels of emotions tend to engage in health-protective behaviors through their travel intentions. As far as we know, no previous research has looked into the relationships among the dimensions of positive emotions (emotional spark and flow), the dimensions of perceived threats (perceived vulnerability and perceived severity), protection motivation, COVID-19 vaccination intentions, quarantine-free travel intentions and the dimensions of COVID-19 protective behaviors (social distancing, mask-wearing and hand hygiene) in the context of quarantine-free travel. To enable Singaporean tourists who have received full vaccination against COVID-19 to visit Batam and Bintan without having to quarantine on arrival, the aim of the current research is to look into the connections between COVID-19 protective behaviors and their relevant constructs: emotional spark, flow, perceived vulnerability, perceived severity, protection motivation, vaccination intentions and quarantine-free travel intentions perceived by fully-vaccinated Singaporean tourists visiting Batam and Bintan.

The current study contributes to our knowledge by proposing the constructs of emotional spark, flow, perceived vulnerability, perceived severity, protection motivation, COVID-19 vaccination intentions, quarantine-free travel intentions, social distancing, mask-wearing and hand hygiene in tourism studies. This contribution is obvious because the resulting outcomes can enhance our understandings of tourists' perceptions of the intricate relationships lying in important tourism constructs in the context of quarantine-free travel. Furthermore, such understandings also benefit quarantine-free travel program marketers by providing them with the chance to create and carry out tourism strategies to increase tourists' perceptions of emotional spark, flow, protection motivation, COVID-19 vaccination intentions, quarantine-free travel intentions, social distancing, mask-wearing and hand hygiene, and decrease their perceptions of vulnerability and severity.

Literature review and hypothesis development

Positive emotions

Positive emotions are defined as seeking opportunities for good feelings from joyful, inspirational, grateful and serene states (Fredrickson & Kurtz, 2011). Chen et al. (2020) propose that tourists' positive emotions consist of emotional spark and flow. First, emotional spark refers to a strong emotional state, including the dimensions of emotional involvement and emotional peak (Tasci & Ko, 2016). It encapsulates the intensity of emotions (Singh, 2019). It also alludes to highs in positive emotions experienced by tourists while on vacation (Tasci & Ko, 2016). Second, the term flow describes an experience when someone acts completely and genuinely, as well as a psychological state in which a person feels cognitively motivated, highly content and, and efficient at the same time (Csikszentmihalyi & Hunter, 2014; Kim et al., 2010). Tourists who experience flow filter out irrelevant information and focus entirely on a single service or product.

Perceived threats

Perceived threats are referred to as the set of cognitions or thoughts individuals have about a potential danger in their environments or a harm that they perceive to be present (Witte, 1994), for themselves or for others (Mordeno et al., 2020). According to Ruan et al. (2020) and Wang et al. (2022), perceived threats consist of estimates of the likelihood of developing a particular disease (perceived vulnerability) and estimates of the seriousness of a disease (perceived severity). Perceived vulnerability refers to

the likelihood of feeling threatened by health conditions, while perceived severity relates to the level of concern an individual has about health threats (Beh et al., 2021). Perceived severity is referred to as an individual's belief about the seriousness of a particular illness, including his or her perception of the significant consequences of a health threat (Witte, 1992). When an individual thinks that he or she will be infected by the virus and the consequences of being infected are serious, then he or she will perceive it as a threat (Bujang & Hussin, 2012).

According to Vacondio et al. (2021), higher positive emotional reactions (i.e. happiness and relief) will lead to lower perceived threats. Alatawi et al. (2020) propose that a positive emotional state such as amusement has a negative influence on perceived threats of the COVID-19 pandemic. Mandel and Vartanian (2010) present that the dimensions of positive emotions would be influential predictors of the dimensions of perceived threats. Hester (2019) demonstrates that the dimensions of perceived resting positive emotions predict the dimensions of threats. Thus, we hypothesize the following:

- H1.** Emotional spark will negatively influence perceived vulnerability.
- H2.** Emotional spark will negatively influence perceived severity.
- H3.** Flow will negatively influence perceived vulnerability.
- H4.** Flow will negatively influence perceived severity.

Protection Motivation Theory (PMT)

Floyd et al. (2000) define PMT as a motivation to protect ourselves based on the “perceived threat and the desire to avoid potential negative outcomes” (p. 408). PMT-informed approaches have been additionally taken to investigate tourists' behavior in terms of how they perceive risk and the level of safety of tourist destinations (Yang & Lee, 2022). The PMT presents a useful theoretical framework that explains the cognitive process tourists go through when coping with the infection risks during and after a health crisis (Lin & Chang, 2021). Nevertheless, it has yet to be applied to the examination of the COVID-19 pandemic (Bustamante, 2021). This also demonstrates a potential research gap that will be addressed in this study, even if the COVID-19 pandemic is a current hot topic.

Ferrer et al. (2018) present that vulnerability and severity perceptions better predict protection motivation when threat perceptions are less severe. Rad et al. (2021) describe that severity and vulnerability positively influence protective behavior. According to Kuang (2020), people who experience a high level of threat are more inclined to partake in the second phase (e.g. evaluating an action's effectiveness).

Those who consider threats to be little or irrelevant will not be motivated to process the information further. Accordingly, we put forth the following hypotheses:

- H5.** Protection motivation will have a positive impact on perceived vulnerability.
- H6.** Protection motivation will have a positive impact on perceived severity.

COVID-19 vaccination intentions

Since the intentions to get vaccination have been demonstrated to predict successive behavior, it is crucial to learn how the public develops intentions regarding COVID-19 vaccination and why a vaccination agenda is regarded as a useful tactic for dealing with the pandemic. Generally speaking, individuals who have a feeling of being threatened by COVID-19 disease or believe that there is a significant danger of infection will have a higher chance of expressing a strong desire to be vaccinated against it (Betsch et al., 2015). Likewise, people who believe they are at a greater risk for coronavirus infection if they receive the new vaccine may not be vaccinated against COVID-19 (Brewer et al., 2007). In contrast, vaccine safety concerns drove low intentions to be vaccinated against COVID-19 (Verger et al., 2021).

Ansari-Moghaddam et al. (2021) indicate that protection motivation is useful in predicting COVID-19 vaccination intentions. Gallmeister (2021) reveals that PMT can be used to increase willingness to get vaccination against COVID-19 among people and provide valuable suggestions to further deal with pandemics and other diseases. Li et al. (2021) describe that PMT has been widely used to analyze the determinants of vaccination intentions. Thus, the following hypothesis is suggested:

- H7.** Protection motivation will have a positive effect on COVID-19 vaccination intentions.

Quarantine-free Travel Intentions

Travel intentions are defined as tourists' desire or intentions to visit destinations (Luo & Lam, 2020; Xie et al., 2021). “Travel bubble” is a hot topic coined by travel agencies, is a scheme that permits tourists to have a trip to the neighboring countries without having to go through quarantine (Luo & Lam, 2020). A safe travel zone involves an agreement with another country to allow tourists to quarantine-free travel to a destination, provided they have not been in a COVID-19 outbreak location in the last 14 days (The Australian Government, 2021). In line with Ahn et al. (2013), this study defines quarantine-free travel intentions as the possibility of traveling to a tourist destination quarantine-free. Quarantine-free travel intentions are the expectation that one may

travel in a certain way or to a particular tourist destination quarantine-free (Sharun et al., 2020). In addition, they are also considered as tourists' intentions to travel or commitment to a quarantine-free destination.

Radic et al. (2021) indicate that intentions to take the COVID19 vaccine are considered to be a predictor of travel intentions. Wang et al. (2022) pinpoint that COVID-19 vaccination increases people's intentions to travel. As a result, we suggest the following hypothesis:

H8. COVID-19 vaccination intentions will positively influence quarantine-free travel intentions.

COVID-19 protective behaviors

Several researchers (Bhati et al., 2021; Chi et al., 2021; Maykrantz et al., 2021) define COVID-19 protective behaviors as the action of social distancing, mask-wearing and hand hygiene. First, the goal of social distancing is to reduce contact with diseased or uninfected persons in order to prevent or reduce population transmission (Saha et al., 2021). Second, mask-wearing is referred to as practicing this behavior during more than 50% of the time spent indoors (Zhang et al., 2021). Wearing a mask is thought to be a powerful and proactive public health intervention that can save lives and reduce future health care costs (Haischer et al., 2020). It can help to mitigate the spread of respiratory diseases, such as COVID-19. Third, hand hygiene refers to using soap and water washing nails and hands, or sanitizing hands (Vikraman et al., 2020). Effective handwashing is considered to be the most important preventative method in order to prevent the transmission of infections (Rupam, 2020).

Higher perceptions of travel intentions result in social distancing, hand hygiene and mask-wearing (Steffen & Cheng, 2021; Xu & Cheng, 2021). As part of the public health response, travel intentions motivate people to adhere to preventive behaviors such as keeping social distancing, washing hands and wearing masks (Bae & Chang, 2021). Thus, we propose the following hypotheses:

H9. Quarantine-free travel intentions will positively influence social distancing.

H10. Quarantine-free travel intentions will positively influence mask-wearing.

H11. Quarantine-free travel intentions will positively influence hand hygiene.

Chi et al. (2021) and Xie et al. (2021) indicate that the emotion tourists experience in one tourist destination can affect their subsequent protective behaviors through travel intentions. Meng et al. (2021) show that the positive health benefits of tourism are mediated by tourists' perceptions

of emotions based on their travel intentions. Gursoy et al. (2021) and Kim et al. (2022) propose that tourists' travel intentions act as mediators in determining the relationship between positive feelings and their protective behavior. Therefore, the following hypotheses are proposed:

H12. Quarantine-free travel intentions will have a mediating effect on the relations between emotional spark and social distancing.

H13. Quarantine-free travel intentions will have a mediating effect on the relations between emotional spark and mask-wearing.

H14. Quarantine-free travel intentions will have a mediating effect on the relations between emotional spark and hand hygiene.

H15. Quarantine-free travel intentions will have a mediating effect on the relations between flow and social distancing.

H16. Quarantine-free travel intentions will have a mediating effect on the relations between flow and mask-wearing.

H17. Quarantine-free travel intentions will have a mediating effect on the relations between flow and hand hygiene.

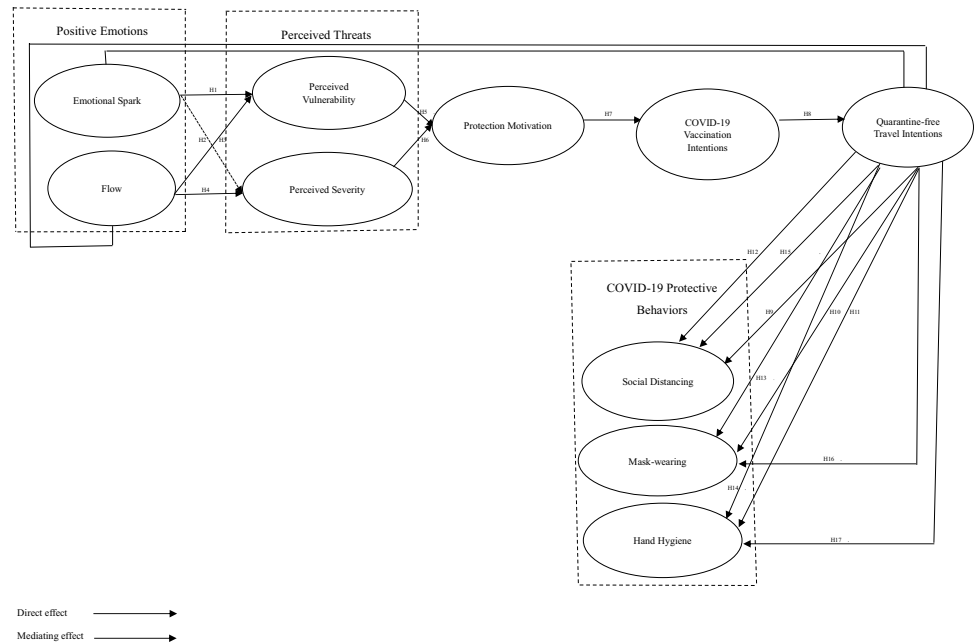
A research model is propositioned based on the above hypotheses and literature review (see Fig. 1).

Research methodology

Measures

With the aim of collecting the information needed to achieve this study's objectives, we used pertinent items from validated and established scales. Specifically, six items relating to emotional spark and flow were revised from Chen et al. (2020). Also, three items related to perceived vulnerability were taken from Qiao et al. (2022), while the other three items addressing perceived severity were modified from the study conducted by Golets et al. (2021). Besides, five items regarding protection motivation were modified from Zheng et al. (2021), while four items related to COVID-19 vaccination intentions were drawn from Cordina and Lauri (2021). In addition, to measure quarantine-free travel intentions, five items were adapted from several studies (see Cabeza-Ramírez & Sánchez-Cañizares, 2022; Das & Tiwari, 2021; Karagöz et al., 2021; Xie et al., 2021). Moreover, social distancing was assessed with five items drawn from the scale developed by Xie et al. (2020), mask-wearing was evaluated by means of three items derived from the study by Xu and Cheng (2021), and hand hygiene was evaluated using four items revised from Birgili et al. (2019). Likert scale of seven

Fig. 1 Proposed study model



points was utilized to rate all the items (1 = *strongly disagree*, 7 = *strongly agree*). Translation and back-translation between Mandarin Chinese, Malay and Tamil were used to ensure that the meanings were equivalent. The questionnaires were pretested with 40 prospective tourists who had undergone quarantine-free travel for comments and suggestions. Changes were made accordingly.

Sample and data collection

A convenience sampling method was used to survey Singaporean tourists aged over 21 years in Batam and Bintan in Indonesia between February 1 and March 31, 2022. Participants’ consent forms were obtained prior to completing the questionnaire. Research assistants provided the appropriate clarification if the participants had queries about the contents of the survey. We distributed 442 questionnaires, and 387 usable samples were obtained after deleting incomplete ones, yielding a response rate of 87.56%. The majority of respondents were male (54.26%), single (51.94%), and between the age of 25 to 34 (25.32%). Most of them had bachelor’s degrees (42.89%) and worked as students (25.32). Their main purposes were traveling (51.16%) and income between S\$2,000 (roughly US\$1,471) and below (28.42%). Table 1 gives details of the respondents’ profiles.

Results

The measurement of this study comprised emotional spark, flow, perceived vulnerability, perceived severity, protection motivation, COVID-19 vaccination intentions, quarantine-free travel intentions, social distancing, mask-wearing and

Table 1 Respondents’ demographic information (N=387)

Variable		Frequency	Percent
Gender	Male	210	54.26
	Female	177	45.74
Marital status	Single	201	51.94
	Married	186	48.06
Age (years)	18–24	78	20.16
	25–34	98	25.32
	35–44	82	21.19
	45–54	68	17.57
	55 or over	61	15.76
Level of education	High school or less	58	14.99
	Associate degree	92	23.77
	Bachelor’s degree	166	42.89
	Graduate or higher	71	18.35
Occupation	Professional	60	15.50
	Employee	91	23.51
	Business owner	68	17.57
	Student	98	25.32
	Retired	45	11.63
	Other	25	6.46
Purpose	Hometown	20	5.17
	Traveling	198	51.16
	Working	91	23.51
	Visiting relations	49	12.66
	Other	29	7.49
Monthly income	S\$2,000 and below	110	28.42
	S\$2,001–S\$3,000	78	20.16
	S\$3,001–S\$4,000	81	20.93
	S\$4,001–S\$5,000	77	19.90
	S\$5,001 and above	41	10.59

S\$ 1.36 = US\$1 (March 1, 2022)

hand hygiene, and possessed a well-developed factor structure (as shown in Table 2). The factor loadings were all over the level of 0.50 (Kock, 2015). The values of Cronbach’s

Table 2 Measurement model and confirmatory factor analysis

Construct	Items	Factor loadings	α	CR	AVE	Mean	SD
Emotional spark	ES1. My visit to Batam and Bintan provides emotional peaks	0.82*	0.79	0.88	0.70	3.46	1.08
	ES2. My visit to Batam and Bintan makes me feel emotionally involved	0.85*				3.37	1.05
	ES3. My visit to Batam and Bintan makes me feel emotionally charged	0.84*				3.39	1.10
Flow	FL1. My visit to Batam and Bintan makes me forget about my daily routine	0.85*	0.80	0.88	0.72	3.40	1.03
	FL2. My visit to Batam and Bintan helps me forget about the time	0.86*				3.37	1.04
	FL3. I am totally absorbed in the trip to Batam and Bintan	0.83*				3.36	1.09
Perceived vulnerability	PV1. I will be easily infected by COVID-19 if I travel to Batam and Bintan	0.89*	0.87	0.92	0.80	2.82	1.07
	PV2. Social distancing is vital when traveling during a COVID-19 outbreak	0.91*				2.84	1.05
	PV3. Traveling is scary while COVID-19 transmission persists	0.88*				2.69	1.09
Perceived severity	PS1. I believe that if I were infected by COVID-19, it would bring severe detrimental consequences to my life	0.90*	0.86	0.91	0.78	2.58	1.14
	PS2. I believe that if I were infected by COVID-19, my health would be significantly affected	0.89*				2.78	1.10
	PS3. I believe that if I were infected by COVID-19, it would lead to widespread community transmission	0.86*				2.79	1.07
Protection motivation	PM1. I protect myself from being infected by COVID-19 when traveling	0.81*	0.85	0.90	0.65	2.86	1.05
	PM2. I will be able to procure sufficient personal protective equipment (e.g. mask, gloves, disinfectant, personal cutlery/chopsticks) prior to my trip to Batam and Bintan	0.80*				2.81	1.07
	PM3. I prefer to visit outside places with fewer visitors (e.g. parks, mountains, and seaside), if I travel to Batam and Bintan	0.81*				2.74	1.04
	PM4. I obey policies to protect myself from being infected by COVID-19 when traveling	0.77*				2.94	1.21
	PM5. I engage in activities that protect myself from being infected by COVID-19 when traveling	0.78*				2.85	1.11
COVID-19 vaccination intentions	CVI1. If a COVID-19 vaccine becomes available, I will vaccinate myself	0.85*	0.87	0.92	0.73	2.84	1.08
	CVI2. I will take a COVID-19 vaccine when it is offered	0.87*				2.78	1.09
	CVI3. I believe that a COVID-19 vaccine will help protect the people who take it	0.84*				2.85	1.10
	CVI4. The opinions of family and friends are important in my decision to take a COVID-19 vaccine	0.83*				2.83	1.12
Quarantine-free travel intentions	QFTI1. I predict that I will travel quarantine-free in the future	0.87*	0.86	0.90	0.68	2.83	1.18
	QFTI2. If everything goes as I think, I will plan to travel quarantine-free in the future again	0.82*				2.73	1.03
	QFTI3. I will say positive things about quarantine-free travel to other people	0.78*				2.77	1.09
	QFTI4. I will recommend quarantine-free travel to others	0.79*				2.81	1.12
	QFTI5. I will encourage friends and relatives to travel quarantine-free	0.75*				2.76	1.11

Table 2 (continued)

Construct	Items	Factor loadings	α	CR	AVE	Mean	SD
Social distancing	SD1. I avoid going out for any activities due to COVID-19	0.94*	0.94	0.95	0.81	2.72	1.17
	SD2. I avoid contact with people who have influenza	0.88*				2.78	1.07
	SD3. I avoid traveling within or between cities/local regions	0.87*				2.79	1.10
	SD4. I avoid using public transport due to COVID-19	0.89*				2.73	1.11
	SD5. I avoid going to crowded places due to COVID-19	0.87*				2.71	1.16
Mask-wearing	MW1. I always wear a mask when going outside	0.90*	0.89	0.93	0.81	2.80	1.16
	MW2. I agree with mask mandate	0.91*				2.71	1.12
	WM3. I agree with the statement that mask can slow virus spread	0.89*				2.73	1.15
Hand hygiene	HY1. I have a duty to act as a role model for other tourists	0.87*	0.90	0.93	0.77	2.67	1.07
	HY2. When busy it is more important to complete my tasks than to perform hand hygiene	0.92*				2.75	1.18
	HY3. Performing hand hygiene in the recommended situations can reduce being infected by COVID-19	0.84*				2.78	1.11
	HY4. I cannot always perform hand hygiene in recommended situations when going out	0.89*				2.75	1.19

* $p < 0.001$, α = Cronbach’s alpha, CR = composite reliability, and AVE = average variance extracted

alpha were also over the cut-off of 0.70, which explained internal consistency in measurement items (Hair et al., 2010). The composite reliability scores were all above the cut-off value, ranging from 0.88 to 0.95. As a result, the measurement had good quality of validity and credibility. Moreover, this study also had determinant validity (see Table 3) because the average variance extracted values were greater than the correlation coefficient (Fornell & Larcker, 1981). Additionally, there were no highly associated variables in the correlation matrix (see Table 3).

Measurement model

To ensure the quality of the conceptual model, a confirmatory factor analysis (CFA) was carried out by utilizing maximum likelihood estimation in the AMOS 22.0. The overall fit statistics were found to be good (CFI, GFI, IFI and NFI ≥ 0.90 ; AGFI ≥ 0.80 ; $\chi^2 / df < 3.00$; RMSEA < 0.79 ; SRMR ≤ 0.08 , GFI = 0.91, CFI = 0.95; AGFI = 0.82, NFI = 0.95, IFI = 0.97, $\chi^2 / df = 1.55$, SRMR = 0.05, RMSEA = 0.05).

Table 3 Correlations between constructs and determinant validity

Constructs	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1. Emotional spark	3.40	0.91	1									
2. Flow	3.37	0.89	0.55	1								
3. Perceived vulnerability	2.78	0.87	-0.41	-0.46	1							
4. Perceived severity	2.71	0.98	-0.44	-0.54	0.52	1						
5. Protection motivation	2.84	0.86	-0.43	-0.48	0.51	0.55	1					
6. COVID-19 vaccination intentions	2.83	0.93	-0.40	-0.43	0.46	0.51	0.58	1				
7. Quarantine-free travel intentions	2.78	0.89	-0.44	-0.42	0.52	0.52	0.56	0.58	1			
8. Social distancing	2.74	1.01	-0.49	-0.39	0.47	0.46	0.47	0.53	0.54	1		
9. Mask-wearing	2.75	1.03	-0.37	-0.44	0.44	0.51	0.51	0.56	0.49	0.52	1	
10. Hand hygiene	2.74	1.01	-0.39	-0.38	0.38	0.49	0.52	0.54	0.53	0.44	0.50	1

Squared correlations of paired constructs are on the off-diagonal

Structural model

We used AMOS 22.0 structural equation modeling program to assess the hypotheses. The results of structural model confirmed that data goodness of fit was acceptable: CFI=0.95, NFI=0.96, GFI=0.90, IFI=0.98, AGFI=0.85, $\chi^2/df=1.88$, RMSEA=0.05, SRMR=0.07.

Hypotheses 1 and 3 predict that emotional spark and flow have a negative influence on perceived vulnerability are supported in the study, meaning that the negative effects of emotional spark ($\beta = -0.19$, t -value = -2.19, $p < 0.01$) and flow ($\beta = -0.48$, t -value = -5.16, $p < 0.001$) on perceived vulnerability are significant.

Hypotheses 2 and 4 suppose that emotional spark and flow have a negative influence on perceived severity. The hypotheses are partially supported, displaying that the negative effect of flow ($\beta = -0.77$, t -value = -6.85, $p < 0.001$) on perceived severity is significant. However, the negative effect of emotional spark ($\beta = -0.18$, t -value = -0.84, $p = n.s.$) on perceived severity is insignificant.

Hypotheses 5 and 6 postulate that protection motivation has a positive impact on perceived severity perceived as well as perceived vulnerability. The hypotheses are fully supported, revealing that the positive effects of perceived vulnerability ($\beta = 0.31$, t -value = 6.34, $p < 0.05$) and perceived severity ($\beta = 0.38$, t -value = 8.70, $p < 0.001$) on protection motivation are significant.

Hypothesis 7 assumes that protection motivation positively influences COVID-19 vaccination intentions. The hypothesis is supported. The result shows that the positive effect of protection motivation ($\beta = 0.86$, t -value = 11.12, $p < 0.001$) on COVID-19 vaccination intentions is statistically significant.

Hypothesis 8 predicts that COVID-19 vaccination intentions have a positive influence on quarantine-free travel intentions. The hypothesis is supported, indicating that the positive effects of COVID-19 vaccination intentions ($\beta = 0.93$, t -value = 12.76, $p < 0.001$) on quarantine-free travel intentions are significant.

Hypothesis 9 assumes that quarantine-free travel intentions have a positive influence on social distancing. The hypothesis is supported. The result shows that quarantine-free travel intentions ($\beta = 0.77$, t -value = 12.54, $p < 0.001$) positively influence social distancing.

Hypothesis 10 predicts that quarantine-free travel intentions positively influence mask-wearing. The hypothesis is supporting, displaying that the effects of quarantine-free travel intentions ($\beta = 0.68$, t -value = 11.36, $p < 0.001$) on mask-wearing are significant.

Hypothesis 11 postulates that quarantine-free travel intentions have a positive influence on hand hygiene. The hypothesis is supported, displaying that the effects of

quarantine-free travel intentions ($\beta = 0.61$, t -value = 11.50, $p < 0.001$) on hand hygiene are statistically significant.

Hypothesis 12 assumes that quarantine-free travel intentions mediate the relationship between emotional spark and social distancing. The hypothesis is supported. The result indicates the mediating effects of quarantine-free travel intentions on the relationship between emotional spark and social distancing ($\beta = 0.20$, t -value = 2.41, $p < 0.01$).

Hypothesis 13 predicts that quarantine-free travel intentions mediate the relationship between emotional spark and mask-wearing. The hypothesis is supported, indicating the mediating effects of quarantine-free travel intentions on the relationship between emotional spark and mask-wearing ($\beta = 0.19$, t -value = 2.29, $p < 0.01$).

Hypothesis 14 postulates that quarantine-free travel intentions mediate the relationship between emotional spark and hand hygiene. The hypothesis is supported, revealing the mediating effects of quarantine-free travel intentions on the relationship between emotional spark and hand hygiene ($\beta = 0.21$, t -value = 2.97, $p < 0.001$).

Hypothesis 15 predicts that quarantine-free travel intentions mediate the relations between social distancing and flow. The hypothesis is supported, showing the mediating effects of quarantine-free travel intentions on the relationship between flow and social distancing ($\beta = 0.28$, t -value = 3.19, $p < 0.01$).

Hypothesis 16 assumes that quarantine-free travel intentions mediate the relationship between flow and mask-wearing. The hypothesis is supported, displaying the mediating effects of quarantine-free travel intentions on the relationship between flow and mask-wearing ($\beta = 0.29$, t -value = 3.21, $p < 0.01$).

Hypothesis 17 postulates that quarantine-free travel intentions mediate the relationship between flow and hand hygiene. The hypothesis is supported, demonstrating the mediating effects of quarantine-free travel intentions on the relationship between flow and hand hygiene ($\beta = 0.34$, t -value = 4.01, $p < 0.001$).

Discussion and conclusions

Despite the fact that quarantine-free travel is very popular among tourists, limited research has explored the relations among positive emotions, perceived threats, protection motivation, vaccination intentions of COVID-19, quarantine-free travel intentions and the dimensions of pandemic protective behaviors. To address this research gap, this study has explored the negative effects of emotional spark and flow on perceived vulnerability and perceived severity, which in turn positively influence protection motivation. Also, protection motivation positively influences quarantine-free travel

intentions through COVID-19 vaccination intentions. In addition, quarantine-free travel intentions positively influence social distancing, mask-wearing and hand hygiene respectively. Furthermore, emotional spark and flow influence social distancing, mask-wearing and hand hygiene through quarantine-free travel intentions.

This study provides empirical results regarding the dimensions of positive emotions, the dimensions of perceived threats, protection motivation, vaccination intentions of COVID-19, quarantine-free travel intentions and the dimensions of pandemic protective behaviors. The results are explained and discussed in regard to the following. First, the study results display that emotional spark and flow have a negative influence on perceived vulnerability. The findings are in consistence with the proposition of Ma and Wang (2009) that tourists prone to positive emotions should be less vulnerable to prolonged or repeated tourism experiences. Second, the research result implies that flow negatively influences perceived severity. This finding is in line with the proposition of Warner and Shields (2009) that more positive emotion is seen as more suitable as the severity of the situation decreases. Yet, the research findings indicate that the negative impact of emotional spark on perceived severity is not significant. This disparity can be attributed to two factors. One factor is that emotional spark may or may be the same depending on various levels of perceived severity in tourism. The second factor is due to the point that the vast majority of tourists believe that their health would be significantly affected if they were infected by COVID-19 when their visit to Batam and Bintan in Indonesia provides emotional peaks. This result disagrees with Hosany et al. (2020) and Yang and Chu (2018), who contend that lower points of tourists' positive emotions lead to higher degrees of perceived severity. Third, the study findings display that perceived severity as well as perceived vulnerability positively influence protection motivation. These findings concur with the contentions of Milne et al. (2000) and Wang et al. (2019) that variables in threat appraisal lead to tourists' motivations to engage in health protection. Fourth, the finding shows that protection motivation positively influences COVID-19 vaccination intentions. This finding supports Schmid et al. (2017), who argue that PMT has been found useful in explaining influenza vaccination intentions. Fifth, the result indicates that COVID-19 vaccination intentions positively impact quarantine-free travel intentions, maintaining Gursoy et al.'s (2021) proposition that vaccination intentions positively impact the travel intentions of tourists. Sixth, the study results reveal that quarantine-free travel intentions have a positive influence on COVID-19 protecting behaviors including hand hygiene, wearing masks, and keeping social distance. These findings agree with the contention of Yang and Xie (2018)

that differential effects of various information sources on tourist protective behaviors should be through a hierarchical study on travel intentions. Lastly, the research results indicate that the dimensions of positive emotions indirectly influence the dimensions of COVID-19 protecting behaviors through quarantine-free travel intentions. These findings are in line with several researchers (Bae & Chang, 2021; Gursoy et al., 2021; Meng et al., 2021), who contend that the impacts of positive emotions on protective behaviors are mediated by travel intentions. This relationship enhances tourists' perceptions of positive emotions, which in turn lead to protective behaviors through their travel intentions. Therefore, travel intentions can increase the association between positive emotions and protective behaviors. As a pioneering study in positive emotions, perceived threats, protection motivation, COVID-19 vaccination intentions, quarantine-free travel intentions and COVID-19 protective behaviors, this study offers valuable guidance for implications.

Implications

Theoretical implications

This study makes several research contributions. First, this study provides new insights into the relationships among positive emotions, perceived threats, protection motivation, COVID-19 vaccination intentions, quarantine-free travel intentions and COVID-19 protective behaviors. Second, this study highlights the effects of positive emotions in terms of emotional spark and flow on perceived threats. This has been neglected in tourism studies as most scholarly attention has been focused on tourists' positive emotions and experiences instead of their relationship with perceived threats (Mitas et al., 2012; Moal-Ulvoas, 2017; Wang et al., 2021). Third, this study demonstrates that perceived severity and perceived vulnerability are drivers of protection motivation, which extend the PMT (Rogers, 1975, 1983) to the quarantine-free travel context. Moreover, previous studies of protection motivation mainly highlight the mechanics of threat assessment as well as coping consideration processes (Feldman et al., 2004; Horng et al., 2014; Yasami, 2021). This study is likely to be the first to investigate the effect of protection motivation on tourists' COVID-19 vaccination intentions. Fourth, although Roger (1975) emphasizes that perceived threats are a major driver of people's protection motivations and associated behaviors, very few studies examine whether quarantine-free travel intentions can be considered as a driving force of COVID-19 protective behaviors within the existing literature. Thus, the present study contributes to the literature in travel and COVID-19

by investigating the direct impacts of quarantine-free travel intentions on COVID-19 protective behaviors. Last but not least, this study also highlights the importance of the mediating effects of quarantine-free travel intentions in the connections between the measurements of positive emotions and the dimensions of COVID-19 protective behaviors, and validates the arguments of emotional spark and flow that not only impact quarantine-free travel intentions, but also enable tourists to embrace more protective behaviors.

Practical implications

This study also provides several practical insights for travel service providers to understand the dimensions of positive emotions, the dimensions of perceived threats, protection motivation, vaccination intentions of COVID-19, quarantine-free travel intentions and the dimensions of pandemic protective behaviors using the propositioned model and delivering valuable information to travel service providers who are developing services and/or products for fully-vaccinated Singaporean tourists visiting Batam and Bintan. To provide tourists with a high-quality visit, understanding the links among positive emotions, perceived threats, protection motivation, vaccination intentions of COVID-19, quarantine-free travel intentions and the dimensions of pandemic protective behaviors can provide destination managers with the information they need to create and develop suitable services, products and marketing strategies. Due to the limited availability of resources, it is crucial for travel service providers to understand where and how they should spend their money.

According to the study results, only partial hypotheses are supported. First, the empirical results reveal that emotional spark has a negative influence on perceived vulnerability. This finding insinuates the importance of manipulating tourists' emotions, particularly their emotional spark under COVID-19, as it is generally believed that strategic success in fighting the COVID-19 pandemic requires confidence and positive emotions (Alatawi et al., 2020). However, the study finding indicates that the negative impact of emotional spark on perceived severity is insignificant, which might be because emotional spark is usually related to the perceptions of fun and amusement instead of perceived severity (Alatawi et al., 2020; Chen et al., 2020). Second, the empirical findings indicate that flow negatively influences perceived vulnerability and perceived severity. When tourists experience a low amount of flow, they may be likely to feel engaged in a variety of tourism activities and perceive the tour to be safe because they do not think they will be easily infected by COVID-19 during the trip. To prevent tourists from being infected by COVID-19 during the trip, travel service providers should facilitate low-risk and sterile travel environments. Third, the study results display that both perceived

vulnerability and severity positively influence protection motivation. The higher the vulnerability and severity perceived by tourists, the more they are likely to be motivated to protect themselves. As a result, quarantine-free travel program policy operators and marketers should actively engage tourists on social media and be able to identify those with higher perceptions of vulnerability and severity through the comments they have posted and provide useful information on epidemic protection measures. Fourth, the empirical result indicates that protection motivation predicts the intention of taking COVID-19 vaccination. To increase the COVID-19 vaccination rate, policy-makers should make more effort to stimulate tourists' protection motivation. Fifth, the result indicates that COVID-19 vaccination intentions positively impact quarantine-free travel intentions. This means that governments should strengthen their information-sharing and interactions with the public regarding COVID-19 vaccination, create positive social moods towards vaccination, and appropriately increase tourists' perceptions of intentions to receive COVID-19 vaccination, thereby leading to the formation of quarantine-free travel information. Sixth, the empirical results demonstrate that quarantine-free travel intentions positively affect the dimensions of COVID-19 protective behaviors: social distancing, mask-wearing and hand hygiene. Travel service providers should provide potential quarantine-free tourists with sufficient personal protective equipment, like face masks and hand sanitizers during the trip, and ensure that tourists feel comfortable with necessary social distancing and the idea of quarantine-free travel. Another crucial result is the identification regarding the mediating roles of quarantine-free travel intentions in the relationship between positive emotions and COVID-19 protective behaviors. This indicates that if governments, destination management organizations and travel operators vigorously promote quarantine-free travel programs in a positive manner, they will enhance tourists' positive emotions which also have a significant impact on protective behaviors relating to the COVID-19 in terms of social distancing, mask-wearing and hand hygiene (Lee et al., 2022; Shi et al., 2021). Moreover, if quarantine-free travel operators want to determine which variables require particular attention when managing tourists' perceptions of positive emotions, perceived threats, protection motivation, COVID-19 vaccination intentions, quarantine-free travel intentions and COVID-19 protective behaviors, perhaps reducing tourists' perceptions of vulnerability and severity is one of the most essential parts that requires continual improvement.

Limitations

Several limitations exist in this study. First, the study findings can only reveal the correlations among the variables. It would be beneficial to conduct more studies using experimental

design to determine the causal relationships between the constructs. Second, the survey was limited to two islands in Indonesia and a single sector (tourism) as the context. Future studies should consider validating the measurement model using samples across nations, sectors or industries. Furthermore, demographic variables (e.g., marital status, education, occupation, nationality and income) should be incorporated into the data analysis in future studies. Third, identifying other factors and/or antecedents of COVID-19 protective behaviors such as degree of accommodation, privacy concerns, social emotion, protective behavioral intention, risk perception, perceived benefits, cues to action, self-efficacy, response efficacy and response cost (e.g., Adhikari & Panda, 2018; Jadir & Ouzir, 2021; Lee et al., 2022; Shi et al., 2021; Siddiqui & Qamar, 2021) will be a worthy endeavor for future research.

Declarations

Conflict of interest The author(s) confirm that they do not have any conflict of interest whether this article is financially or non-financially supported by certain organizations.

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