

Cruise ship safety measures and their influence on passenger sense of security and purchase intention

Shadi Bahattab, Shiang-Lih Chen McCain and Jeffrey Lolli

Abstract

Purpose – *The purpose of this study is to investigate whether customers perceive current cruise ship safety measures provided as meeting a sense of security and their influence on purchase intention. Three types of potential risks associated with cruise lines evaluated were external/internal attacks, malfunctions/accidents and onboard medical/health issues.*

Design/methodology/approach – *A survey used 12 safety measures questions to examine how cruise ships handle the above three risks, three questions to measure a sense of security and three questions to measure purchase intention. A seven-point Likert scale was applied. Convenience sampling was used. There were 163 valid responses collected.*

Findings – *All three safety measures evaluated in this study had a direct and positive effect on passengers' Sense of Security. Also, Safety Measure (SM) 2 and Sense of Security had direct and positive effects on purchase intention. Finally, SM1 and SM3 have only indirect impacts on Purchase Intentions via Sense of Security.*

Research limitations/implications – *Because of the small sample size and the convenience sampling method, the results of this study may lack generalizability.*

Practical implications – *Cruise managers should be aware that merely providing safety measures that are regulated by guidelines is not sufficient, and passengers must personally see and experience safety measures.*

Originality/value – *This study evaluated not only customers' perceptions of safety measures on a cruise ship but also their impact on a sense of security and how that played a moderating role in purchase intention.*

Keywords *Cruise ship safety measures, Passenger sense of security, Purchase intention, Risks, External/Internal attacks, Malfunctions/Accidents, Medical/Health issues*

Paper type *Research paper*

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Introduction

According to the Cruise Lines International Association [CLIA \(2021\)](#), the cruise industry has seen a steady increase in passengers in the past 10 years from 17.8 in 2009 to 29.7 million in 2019, a 66.9% increase. In 2018, before the pandemic, 82% of cruisers stated that they would likely book a cruise as their next vacation and the cruise line industry contributed 150bn to the worldwide total output, providing 1.2 million jobs and 50.2m in wages and salaries ([CLIA, 2020a](#)).

While the cruise industry has experienced significant growth in the past, continuing stories of outbreaks of various illnesses along with physical malfunctions on ships can deter future passengers. Even before the pandemic, the cruise industry has been plagued by safety and security issues because of multiple cruise ship accidents and illness outbreaks making worldwide headlines. For instance, 123 passengers and crew contracted norovirus in 2012 on the Emerald Princess Cruise Ship adding to a total of 15 outbreaks of illness as reported

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by the Centers for Disease Control ([Gehrke-White, 2012](#)). Other issues that made national headlines were the Costa Concordia Ship which sank in 2012, resulting in 32 deaths. In 2013, the Triumph Ship's systems shut down and left approximately 4,200 passengers stuck in Gulf waters with little food and raw sewage for several days. In 2014, on the Explorer of the Seas Ship, 600 passengers contracted a gastrointestinal illness and the ship was forced to turn around back to port ([Maritime Injury Guide, 2018](#)). Consequently, cruise ships are also considered "floating Petri dishes" ([Henson, 2015](#)). "Add in recurring incidents like overboard cases and stomach illness, and it's enough to make some people swear off cruising forever" ([Sampson, 2019](#), para 2).

Traditionally, the cruise line industry has been notoriously vulnerable to viral diseases before the pandemic. The pandemic further negatively impacted the cruise industry. Originally projected at 32 million in 2022, only 5.8 million passengers cruised. This was an 81% decrease from 2019 ([CLIA, 2022](#)).

Cruise ships have inherent concerns when they move passengers across the water. Ships must navigate complex and dangerous physical environments typically associated with an ocean or large body of water. The public expects that cruise lines anticipate this and develop and implement stringent protocols and measures to demonstrate that the safety and security of its passengers are of the utmost importance at all times. Passengers must have confidence in the systems associated with safety and security on a ship to the point that it does not predispose their enjoyment of the cruise experience. Therefore, any negative impacts whatsoever can be adverse ([Baker, 2013](#)). Therefore, the purpose of this study is to investigate whether customers perceive current cruise ship safety measures provided as meeting a sense of security and their influence on purchase intention. The results of this study will assist the cruise line industry in having a better understanding of customers' perceptions of their current safety measures. Based on the results, the cruise line industry can revamp its safety measures to enhance customers' sense of security.

Literature review

Safety measures

Based on the three types of potential risks associated with cruise lines identified from the CLIA regulations, external/internal attacks on customers or crew, malfunctions/accidents and onboard medical/health issues among passengers and crew, 12 safety measures were developed to examine how the cruise line industry handle those potential risks.

Safety measures for external/internal attack (SM1)

External attacks on cruises are those elements that occur from the exterior of a ship ([Gormley et al., 2014](#)). For example, terrorist and piracy attacks can be considered an external situation that would affect passengers' sense of security as well as the company itself. There are safety measures that can be used for external attacks on cruises:

- security guards;
- surveillance cameras;
- securing and controlling access to any sensitive areas; and
- connections with the FBI, Homeland Security and the US Coast Guard.

Conversely, internal attacks on cruises are those elements that occur from the interior of the ship ([Gormley et al., 2014](#)). There are safety measures that can be implemented for internal attacks on cruise ships:

- passenger background checks;
- passenger crime reporting systems;

- comprehensive screening process for passenger boarding; and
- high-tech screening and monitoring equipment for weapons and explosive devices.

Safety measures for handling malfunctions and accidents (SM2)

Accidents and technical problems on a cruise ship occur when there are mechanical defects or faults (Preston, 2014). Furthermore, accidents can occur on board, while the ship is docked or sailing on the water, for example, crashing into an object while cruising (Preston, 2014). A loss of electrical power/operation and fire are the two main types of water technical faults that occur during a cruise.

Safety measures for water technical faults that can be implemented are:

- completing routine maintenance of the ship on the engines, overall facilities, power generators and lifesaving mechanisms; and
- having high-tech navigation systems to properly navigate vessel traffic/obstacles as well as underwater objects such as land and rocks that will aid in collision avoidance.

Safety measures for handling accidents that can be implemented are having the appropriate number of life jackets on the ship, having sufficient lifeboats onboard, ensuring heavy objects are secure on the ship to prevent movement during sailing and providing clear signs and instructions onboard.

Safety measures for dealing with onboard medical/health issues (SM3)

Medical/health issues from food poisoning, minor injuries from burns or falls to more serious communicative diseases resulting from confined spaces such as COVID and Norovirus, to more serious health issues such as a heart attack can happen onboard among passengers and crew. Foodborne illnesses are the most common health safety issue reported. Serving food safely involves proper food handling through the flow of food. Following a food safety program, foodborne illnesses can be eliminated (Schmidt and Rodrick, 2003). While the COVID virus is still a concern, it should be noted that the data for this study were collected before the COVID pandemic. The safety measures that can be implemented for handling medical/health issues are 24 h clinical services, easy access to emergency medical helicopters, industry-standard protocols for cleaning public and food storage areas and employee training.

Sense of security for passengers on cruise ships

There have been concerns raised in the past by the public regarding the safety and security of the cruise industry. They have been exposed to frequently publicized multiple tragic cruise ship accidents and health incidences onboard and the carelessness of cruise line companies. Thus, it is crucial to have sound safety measures which can improve passengers' sense of security. When cruise ships provide an onboard environment that passengers consider safe and secure, it can lead to a higher level of sense of security and, ultimately, purchase intention (Baker, 2014).

A sense of security can be anything from feeling safe from violence to having the awareness that one's well-being is being addressed at all times (Fukuda and Messineo, 2012). In the cruise industry, passengers want to be confident in the ship's operation and staff to know that they will have a safe and secure voyage (Graham and Dodd, 2009). It is important to consider both the physical and mental well-being of passengers (Wheeler, 2013). According to Schnider and Bowen (1999), cruise ships' safety measures, such as those related to dealing with threats associated with external attacks, helps in improving the sense of security among cruise passengers.

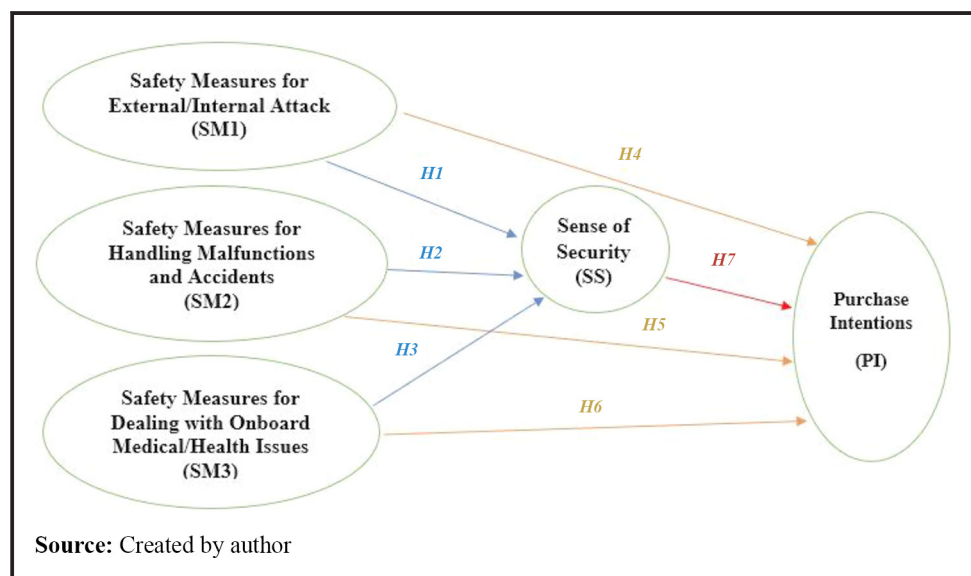
Passengers' purchase intentions

Chan and Lam (2013) found that safety measures on cruise ships are important for passengers' purchase intentions. Therefore, it is incumbent upon cruise companies to ensure they meet passengers' sense of security perceptions and expectations to increase purchase intention. When safety measures onboard cruise ships are improved, passengers who have had a positive and safe trip will be encouraged to rebook. If the cruise company communicates and demonstrates its commitment to providing a safe and secure environment on board, then prospective passengers will be encouraged to purchase a cruise trip. Cruise companies must understand the relationship between safety measures and passengers' sense of security and purchase intentions.

Global transportation companies have been putting safety measures in place for some time to make passengers feel safe and secure during their trips. In the travel industry, all airports around the world have technology in place to detect passengers' explosives and weapons. In the airline industry, passengers expect "safety in flying" and "feeling safe in transactions with airlines" as mandatory. For example, Emirates Airlines has an outstanding safety record and has never reported a fatal incident; therefore, passengers' sense of security is increased when traveling on this airline (Wilfing, 2012). When transportation companies fail to institute safety measures, guidelines and regulations passengers will lose their trust which will lead to a decrease in passengers' purchase decisions. This confirms safety measures and a sense of security are now expected and can enhance customer satisfaction. However, failing to provide these will lead to poor customer satisfaction (Basfirinci and Mitra, 2015). Accordingly, this study proposed the following seven hypotheses (Figure 1):

- H1. There is a direct relationship between safety measures for external/internal attacks and passengers' sense of security.
- H2. There is a direct relationship between safety measures for handling malfunctions and accidents and passengers' sense of security.
- H3. There is a direct relationship between safety measures for dealing with onboard medical/health issues and passengers' sense of security.
- H4. There is a direct relationship between safety measures for external/internal attacks and passengers' purchase intentions.
- H5. There is a direct relationship between safety measures for handling malfunctions and accidents and passengers' purchase intentions.
- H6. There is a direct relationship between safety measures for dealing with onboard medical/health issues and passengers' purchase intentions.
- H7. There is a direct relationship between passengers' sense of security and passengers' purchase intentions.

Figure 1 Proposed hypothesis



- H5. There is a direct relationship between safety measures for handling malfunctions and accidents and passengers' purchase intentions.
- H6. There is a direct relationship between safety measures for dealing with onboard medical/health issues and passengers' purchase intentions.
- H7. There is a direct relationship between passengers' sense of security and their purchase intentions.

Methodology

A survey instrument was developed in consultation with a cruise line industry expert at a leading cruise company and used 12 questions measuring cruise ships' safety measures based on the [Federal Register's \(2014\)](#) "Guidelines for Verifications of Vessel Security Plans," the [CLIA \(2020b\)](#) "Security at Sea," three questions derived from [Baker \(2014\)](#) to measure a sense of security (i.e. I do not feel threatened by any possible acts of crime and incidents) and three questions measuring purchase intention (i.e. I intend to take this cruise ship again) ([Harris and Goode, 2010](#)). A seven-point Likert scale was applied where 1 = strongly disagree; 7 = strongly agree; and NA = not applicable. The final survey questionnaire was generated based on feedback from the pre-test regarding wording, vocabulary and clarity. Convenience sampling was applied. One of the authors distributed the survey questionnaire at a tourist destination in an east coast metropolitan city in the USA in November 2016.

Results

Demographic profile

The survey contained a filter question to identify participants who were domestic residents and had a cruise vacation in the past five years. There were 163 valid responses collected. More than half (59.5%) of the participants reported as male. In terms of age, 29.4% reported 31–40 years and 27.6% reported 41–50 years old, more than half (57%) of the total respondents. In terms of occupation, 28.8% reported a management position and 23.3% reported being self-employed, more than half (52.1%) of the total respondents. Finally, 24.5% reported a household income between \$100,000 and \$149,999 ([Table 1](#)).

Principle component analysis for the three safety measures

The principal component analysis with varimax rotations was used to extract three factors with an eigenvalue of greater than 1 and in total explained 72.045% of the variance. A value of 0.5 was used as the cut-off value for the inclusion of the items in the construct. One question was removed because of the low factor loading ([Table 2](#)). The standardized component scores were saved for each respondent to be used in the following PROCESS analysis. All constructs possessed satisfactory reliability with Cronbach's alphas ranging from 0.829 to 0.933.

Results of hypothesis testing

To investigate the direct, indirect and total effects the three safety measures have on customer purchase intention with a sense of security as the mediator, the [Hayes \(2013\)](#) PROCESS was applied. Research applying the [Hayes \(2013\)](#) PROCESS has been commonly published in business and marketing academic journals and conferences ([Hayes et al., 2017](#)). [Hayes \(2013\)](#) PROCESS explores the nature of the mediation model, and this procedure is considered to be a very powerful method because of its bootstrapping confidence intervals for the indirect effects ([Cai et al., 2018](#); [Jarrar et al., 2018](#)).

The results of [Hayes \(2013\)](#) PROCESS Model 4 explained 59.18% of the variability in purchase intention ($R^2 = 0.5918$; and $p < 0.001$). SM1, SM2 and SM3 had direct and positive effects on a Sense of Security. Also, SM2 and Sense of Security had direct and positive

Table 1 Demographic profile of the participants (N = 163)

Item	Frequency	%
<i>Gender</i>		
Male	97	59.5
Female	66	40.5
<i>Age</i>		
18–30	37	22.7
31–40	48	29.4
41–50	45	27.6
51–60	17	10.4
61 and older	16	9.8
<i>Occupation</i>		
Students	8	4.9
Self-employed	38	23.3
Professional	32	19.6
Laborer	17	10.4
Management	47	28.8
Retired	15	9.2
Other	6	3.6
<i>Annual household income</i>		
\$34,999 and under	16	9.8
Approximately \$35,000–\$49,999	23	12.3
Approximately \$50,000–\$74,999	23	14.1
Approximately \$75,000–\$99,999	29	17.8
Approximately \$100,000–\$149,999	40	24.5
\$150,000 and more	35	21.5

Source: Created by authors

Table 2 Results of principle component analysis for the three safety measures

	Factors		
	1	2	3
<i>Safety measures for external/internal attacks (Cronbach's alpha = 0.829)</i>			
SM 11	The cruise line performs background checks for its passengers (ID checking)	0.789	
SM 12	The ship has controlled access to sensitive areas such as the bridge and engine room	0.766	
SM 13	This ship has security guards onboard	0.736	
SM 14	The ship has surveillance cameras	0.682	
SM 15	Passengers and their luggage are screened	0.648	
<i>Safety measures for dealing with onboard medical/health issues (Cronbach's alpha = 0.880)</i>			
SM 31	The ship has medical personnel who are available 24 h a day		0.894
SM 32	Medical facilities within the ship have adequate treatment and examination rooms		0.888
SM 33	The ship has the ability to isolate sick passengers and crew		0.858
<i>Safety measures for handling malfunctions and accidents (Cronbach's alpha = 0.855)</i>			
SM 21	The ship provides clear instructions on emergency procedures in terms of fire drills		0.873
SM 22	The ship provides clear instructions on emergency procedures in terms of lifeboats and lifejackets		0.825
SM 23	The ship provides clear signs and instructions on board		0.815

Source: Created by authors

effects on purchase intentions. Finally, SM1 and SM3 have only indirect impacts on Purchase Intentions via a Sense of Security (Table 3).

Conclusions and implications for practitioners

The results confirm the importance of a sense of security regarding cruise customers' purchase intentions. The results also signify the importance of the mediating role that a

Table 3 Direct and indirect effects of safety measures on purchase intentions

	Direct effect	Indirect effect (Mediator-SS)		Total effect
	Estimated	Estimated	95% CI	
SM 1 → SS	0.5384***			
SM 2 → SS	0.3870***			
SM 3 → SS	0.4015***			
SM 1 → PI	0.0494 ^{n.s.}	0.3142	(0.2091; 0.4339)	0.3636
SM 2 → PI	0.2289***	0.2258	(0.1331; 0.3208)	0.4547
SM 3 → PI	0.1125 ^{n.s.}	0.2343	(0.1438; 0.3387)	0.3468
SS → PI	0.5836***			

Notes: ^{n.s.} Nonsignificant; *** $p < 0.001$

Source: Created by authors

sense of security plays (as SM1 and SM3 have only indirect effects) on purchase intentions. Cruise managers should be aware that merely providing safety measures that are regulated by guidelines is not sufficient. The cruise industry should reinforce the delivery of these three safety measures. Furthermore, when cruise companies promote and educate their customers on safety measures in place on a ship, they can enhance customers' sense of security which can finally lead to purchase intention. It is not enough to be aware of the safety and security plan; passengers must personally see and experience safety measures.

In particular, cruise lines should focus on those safety measures for external/internal attacks (SM1). Not only safety and security policies and procedures should be posted but also crew members need to be highly trained. Emergency procedures and drills should be well-reviewed with passengers when boarding before leaving port. A comprehensive security plan before departure and at sea with rigorous security checkpoints, video surveillance, crime reporting transparency, an inspection of prohibited items when boarding and highly trained crewmembers are crucial (CLIA, 2020b). When passengers physically see and experience the security plan in action, their sense of security will be increased.

Furthermore, of all customers' impressions of mishaps on cruises, SM2 (safety measures for handling malfunctions and accidents) has the greatest effect on purchase intentions among the three safety measures. According to CLIA (2020c), while cruise capacity grew to 67% from 2009 to 2019, operational incidents declined by 41% and man overboard incidents by 35%; consumer safety concerns about cruise ships have not been lessened because of media widely publicizing these incidents. This creates a negative image for the cruise industry in general, regardless of the cruise line company. The industry needs to work on its public image. The industry has to get out in front and demonstrate what it is doing to reduce the potential for accidents or operational malfunctions, as this can directly impact purchase intention. For example, ensuring robust crewmember training in safety, security and first aid, continuous improvement to review operational procedures to improve safety processes and technology, seeking the advice and direction of external independent experts to enhance current safety measures and in addition to meeting minimal international guidelines, all cruise ships should go further and contain sufficient survival equipment to a level of at least 125% of the number of passengers on board. Again, this must be explained and visible to all passengers.

Finally, cruise lines should focus on safety measures for dealing with onboard medical/health issues (SM3), as the cruise industry's image has been tarnished by multiple onboard illness outbreaks in the past. As the results revealed, even before the pandemic, customers' purchase intentions were impacted by how the cruise line handled potential safety risks. Before the unprecedented COVID outbreak, cruise ships had to deal with norovirus outbreaks among passengers. Now the concerns about norovirus have been worsened. In the post-COVID era, the cruise line industry needs to go above and beyond to reassure customers about the safety measures they took, such as the ability to provide rapid COVID

testing, isolation areas that reduce the chance of spreading the virus to other passengers and crew and medicines such as Paxlovid™ that can shorten the symptoms and duration of COVID. The nature and design of cruise ships do not lend to some of the recommended preventative measures that reduce the spread of the highly infectious COVID virus. Therefore, cruise ships must also use strict cleaning and sanitation practices at the recommendation of the Centers for Disease Control and other public health officials that keep both crewmembers and passengers healthy. Pre-boarding health screenings through a questionnaire or possible health checks should be implemented to help identify ill passengers or crewmembers before boarding. Cruise ships must have at least one qualified medical professional available 24/7 as well as an examination and intensive care room, medicines and equipment for processing labs. The ship should also have a way to isolate passengers that show symptoms of an illness to avoid spread (CLIA, 2020d). When passengers see the ship implementing safety measures for dealing with onboard medical/health issues, their sense of security will be increased.

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