



A Comparative Assessment of Risk Management Practices and Travel-Related Risk Perceptions Among Thai Tourist Scuba Divers in Phuket, Thailand

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Abstract

The risks are commonly associated with weather, natural disasters, and health related-issues in both expected or unexpected situations. Scuba diving is a high-risk activity, and at one atmospheric pressure, people can be able to adapt themselves. Generally, for all divers, the underwater world is a non-respirable world. Therefore, they are at all risks of deadly injury caused by increasing hyperbaric pressure. Protection Motivation Theory (PMT) had been conducted to the survey for threat appraisal and coping appraisal due to the risk measurement while traveling to scuba dive in Phuket. Quantitative research technique was used to collected data from 308 Thai tourist divers who came to Phuket for scuba diving during the first quarter of 2022. Data analysis was performed using descriptive statistics and correlation analysis. The findings showed that risk perception among Thai tourist scuba divers who traveled to Phuket had vary in terms of demographic background, diving experience, and diving risk perception.

Keywords: Safety factor; Tourist risk experience/perception, Recreation experience, Safety standards and code of practice, Type of risk perception

Introduction

According to UNTWO, Thailand is one of the world's top nations with the most developed tourism markets in terms of tourism. Local tourist s and international tourists travel in Thailand for various activities and purposes; eco-tourism, snorkeling, scuba diving, and trekking. The top two of population density and touristic parts of Thailand are Bangkok and Phuket (AOT, DOA). One of the popular cities where tourists visit for adventure



activities like scuba diving is Phuket (PADI Travel, 2020). Phuket is surrounded by water and in the past, local people were used to fishing for pearls, tin mining and rubber plantation to make a living (Phuket.Net, 2018). In the mid-1980s, Thailand entered a period of rapid economic transformation, the tourism industry began to undergo a “touristic transition” (Cohen, 2001; Page 17).

The overview of Thai tourism news, it has performed exceptionally well in the 2017 edition of the SmartTravelAsia.com, Best in Travel Poll with Bangkok, Phuket Koh Samui as well as Hua Hin. They were ranked among the ‘Top 10 Holiday Destinations’, voted by over 1.2 million online magazine’s worldwide readers (TAT Newsroom, 2017).

Scuba diving has started in the early 1930s with Military during purposes along the French Mediterranean coast and in Southern California, USA. From time to time, this instruments have been developing continuously (All4Diving, 2017) and it has become one of the most popular recreational underwater sports.

Risk management is directly involved to scuba diving industry both diving operators and the divers. According to Cuskelly and Auld’s theory of risk management would have identified as follows: risk retention, risk transfer, risk reduction, and risk avoidance. However, in this research, “Protection Motivation Theory” or “PMT”, is conducted in accordance to Roger’s modification theory developed from ‘Fear Appeal’. PMT provides a framework for better understanding of the reason for attitudinal and behavioral change in risky situations.

Since diving is an important marine tourism sector in Thailand, especially in Phuket, it requires proper safety standards to reduce the risks and increase accessibility to its market. This study was conducted with its two main objectives; to measure travel-related risk perceptions from tourists who engage in scuba diving in Phuket and to assess effects of demographic on the overall travel risk perceptions of tourists when engaging in diving activities.

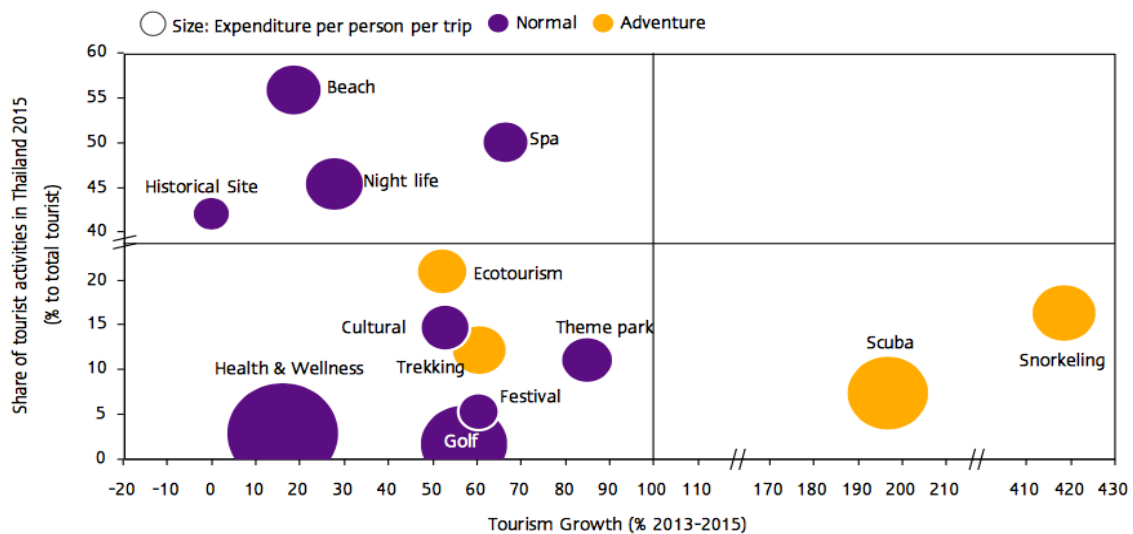


Figure 1.1 Share of popular activities in Thailand (2015)

Literature review

Different Definition of risk

Definition	Source
<i>"Risk is the measure of probability and the weight of undesired consequences"</i>	(Lawrence, 1976)
<i>"Risk equals to product of probability and severity"</i>	(Wilson & Crouch, 1982)
<i>"Risk is a combination of five primitives: outcome, likelihood, significance, causal scenario and population affected"</i>	(Kumamoto & Henley, 1996)
<i>"Risk is a situation or event where something of human value (including humans themselves) has been put at stake and where the outcome is uncertain"</i>	(Rosa, 1998)
<i>"Risk is an uncertain consequence of an event or activity related to something of human value"</i>	(International Risk Governance Council, 2005)
<i>"Risk equals expected damage"</i>	(Campbell, 2005)
<i>"Risk is the likelihood of an injury, disease or damage to the health of employees due to hazards"</i>	(Law on Safety and Health at Work, 2005)
<i>"Risk refers to uncertainty about and severity of the events and consequences (or outcomes) of an activity with respect to something that humans value"</i>	(Aven & Renn, 2009)



In general, risk can be divided into 2 main types; one is controllable e.g. uncertainty of success or failure. In contrast, feeling of insecurity or nervousness when confronted with uncontrollable situation (Morgan, 2001). The classification of risk can be related to financial and no-financial, static and dynamic, pure and speculative as well as fundamental and particular ones (Amirudin et al., 2017). Researches around risk in tourism industry often explore risk from tourist's perspective where risk is often referred to as perceived risk (Yang & Vikneswaran, 2014). Perceived risk can be divided into three dimensions namely physical-equipment risk, destination-specific risk, and vacation risk (Roehl & Fesenmaier, 1992). The topic of perceived risk is discussed further in later section.

Factors that influence on travel decision making

According to the theory of Maslow in 1970 'Hierarchy of Needs' and 'Travel Career Ladder' by Pearce in 1988, Williams and McNeil proposed the patterns and motives of academic travelling as (1) survival which concerns of meeting off-campus teaching and learning expectations, (2) safe travel competency and administration, (3) social development and building relationships, (4) leadership development, and (5) fulfillment of a traveler status. However, Simpson and Siguaw's (2008) found that demographic characteristics are generally involve with gender, age, marital status and income. Some of which can lead to limitation on one's travel choices e.g., females may find difficulties in some places due to their gender. Besides, income and education are also necessary as much as other variables.

Demographics

In this research, one of the main variables to risk perception is demographics. Its characteristics are varied as the study mentioned in the research. However, to assess traveler's perspective and manageable risks on traveling, Simpson and Siguaw (2008) and studies in the past have considered and focused on traveler type; traveler or non-traveler, gender differences, age differences, ethnic/country group differences, marital status differences (married, single, widowed, and divorced), and income group differences.



Risk perception towards traveling

Deng and Ritchie (2016) defined travel risk perception from International University students that identified six major aspects are as follow: Physical risk concerns the danger of getting physical harmed while in a foreign country. Physical risk can in turn be divided into political instability, health issues, crime and harassment, as well as terrorism. The types of physical risk can even be subdivided even more.

Psychological risk is related to the emotions which are felt when a planned trip conflicts with one's personality. Boksberger, Bieger, & Laesser (2007) described it as the risk of being embarrassed or losing one's confidence. The sources of psychological risk to a traveler can include the atmosphere of the destination, language barriers, cultural barriers and the feeling on claustrophobia from intense crowds.

Social risk is related to not conforming to the standards of the host country natives or other travelers in the area. In addition to studies being done on travelers' self-image as thought of by the locals, Floyd & Pennington-Gray (2004) explored the perceptions of the friends and family members of the traveler. Studies were also done on the social risk emanating from how tourists perceive each other. Such as either as strangers or disturbers. And sometimes even as competitors (Pearce, 2005).

The potential for a trip to not live up to expectations can be described as performance risk. In previous studies on tourism, performance risk was described as "equipment/functional risk", "expectation risk" or "satisfaction risk" (Roehl & Fesenmaier, 1992; Promsivapallop and Kannaovakun, 2017). There are many variables to performance risk, which include travel value, environment, landscape, attractions, entertainment, infrastructure, accessibility and relaxation (Chi & Qu, 2008; Yu & Goulden, 2006).

Financial risk is the risk of losing the funds invested into a trip. Or another way of putting it is, when the trip isn't worth it (Roehl & Fesenmaier, 1992). Chi and Qu (2008) and Sönmez and Sirakaya (2002) examined travelers' perceptions of 'value for money' in a general sense. Simpson and Sigauw (2008) delved into financial concerns and overpricing. They interestingly determined that travelers were more concerned about over-spending than the actual prices of tourism related items and services.

Time risk refers to risk of a trip draining one's time, or as described by Mowen & Minor a particular travel related decision will cost more time that would have liked. Time was determined to be a very important factor in a number of research cases. Gallarza and



Gil Saura (2006) highlighted four factors: amount of time for planning and preparation, time spent on returning back home, cost of losses of time and finally, time spent on the actual trip itself.

However, previous travel experience and repeat visitation, choice of destination, country of origin and group differences have been recognized to be other determining factors as to how a tourist perceives travel risks. Past experience has a major impact because it can establish awareness and knowledge of potential risks and determine a tourist's intentions. Individuals' having more travel experience are usually more immune to travel risk concerns (Lepp & Gibson, 2003).

Country of origin, tourists from different countries have been studied and comparisons have been made. With the studies tending to be context and situation specific. Surveys were conducted on different nationalities and ethnic backgrounds, exploring how they reacted to different elements of risk.

Group differences in risk perception, studies related to travel risk show that the category and level of concern of risk factors differ depending on the individuals examined and their specific situations. A diverse range of factors, including past experience, lifestyle and demographics also have an impact. It was also discovered that certain variables had an impact on people's interpretation of risk and safety. These included age, nationality, and purpose of visit (George, R., 2010). Simpson and Siguaw (2008) found that demographic characteristics; gender, age, marital status, ethnic group and household income are also significant factors to travel risk perception. Apart from the mentioned risks, in terms of hospitality and tourism industries, technology risks and business risks are included into the type of risks (Analysing Risk Management in Holiday and Hospitality Industries Tourism Essay, 2020).

Risk associated with recreational scuba diving

Scuba diving is an important marine tourism sector in many countries including Thailand. Scuba diving is recreational tourist activities that requires proper standards of safety to minimize the risk and enhance market accessibility (Lucrezi et al., 2018). Even though scuba diving in this era is a relatively safe sport (Wilks & Davis, 2000), safety concern related to scuba diving still receive negative attention from the global media (ibid, 2000). Unlike professional diving where the activities is governed by established risk assessment,



codes of practices, regulation, and mitigation programmes, which make it a safe profession, recreational diving is based on self-responsibility where accident is more common (Lucrezi et al., 2018).

Lucrezi and colleagues (2018) have listed a series of risks exposed to recreational scuba divers, which could result in accident, injury, liability, or even death to the divers. Recreational associated risks mentioned by the researchers include risky behaviour by client (e.g. no pre-dive checks), risking behaviour by staff (e.g. alcohol abuse), sunburn, illness, stress, various hazards (e.g. sharp objects, slippery floors/roads), electrical failures, fires and explosions, chemical/bacterial exposure, social instability/violence, crime, distant/inaccessible emergency facilities/services/assistance, vehicle incident/accident (e.g. car crash), inefficient emergency assistance plans, compressor failure, poor breathing gas quality/wrong gas mixture, vessel incidents/accidents (e.g. capsizing, engine failure, falling), bad weather and rapid climatic change, diving equipment malfunction/failure, diving incidents/accidents (e.g. buddy system failure, running out of gas), and marine life injuries (Lucrezi et al., 2018).

Governmental regulation and law concerning scuba diving in Thailand

Thai scuba diving business in Thailand is governed under the Tourism Business and Guide Act B.E.2551 (2008). According to the legislation, dive operators must file multiple documents, including boat documents, certificate of dive professionals and crew, accident insurance document, and certificate of diving equipment, to ensure the safety of the business operation (Department of Tourism, 2008). In addition, the Department of Tourism has also issued Standard Number Mor Tor Tor 407: 2556, which establishes qualification requirements for scuba diving businesses and scuba diving activity intendants in each region of Thailand to follow in order to assess the level that shows a company's or diving area's quality. (Sombatsubsin, 2014). Occupational Safety, Health, and the Environment in Relation to Diving Work is governed by the Ministerial Regulation on Prescribing the Standards of Administration and Management of Occupational Safety, Health, and the Environment. The diving work regulations are outlined in B.E.2548. But the purpose of these laws is incompatible with the practice of recreational scuba diving, as shown by the following: It seems to be applicable solely to the particular profession diver who works in the commercial diving industry (Sombatsubsin, 2014).



During COVID-19 some dive operators in Phuket obtained the SHA+ guarantee from Amazing Thailand Safety & Health Administration as a reassurance to their customers. With this guarantee, dive operators must ensure the following practices (Aloha diving, 2022):

- Both staff and divers must be vaccinated with approved vaccines
- Staff must wear masks at all times while they are in the dive shop, on the piers, and on the boats
- Facilities, including both the dive shop and boat, must provide accessible to hand sanitizer
- Dive shops must be disinfected twice a day
- Boat must be disinfected in the morning at the pier before all dive trip, and again after the completion of the trip
- Food safety must be ensured by providing lunch for individual diver in a sealed package.
- Sanitize all dive equipment (BCD, fins, regulator, second stages, oral inflators, masks, wet suits, and snorkels) each time after use with Quaternary Ammonium Compounds or Bleach
- Daily monitoring of body temperature of both crews and divers

Other basic COVID-19 preventive measure recommended by DAN are as follow (DAN, 2022a):

- Frequent handwashing
- Avoid touching mouth, nose, and eyes
- Social distancing at a minimum of 1.5 meters

Theoretical framework

Protection motivation theory

One of the most cited theories related risk perception is Protection Motivation Theory or PMT (Becker & Maiman, 1975). PMT suggests that people are more likely to protect themselves when they anticipate negative consequences, have the desire to avoid them and feel they have the ability to take preventive measures (Rogers, 1975). Originally the theory was developed as a theory of fear appeal (ibid, 1975), however, PMT was later revised into a general attitudinal change model (Maddux & Rogers, 1983). PMT included



the self-efficacy construct, which make the theory became an attitudinal model with the emphasis on the cognitive processes that has the ability to mediate behavioral change (ibid, 1983). Based on this assumption of the theory, PMT provides a framework for better understanding of the reason for attitudinal and behavioral change in risky situation (Floyd et al., 2000). Scholars suggested that PMT is comprehensive enough to apply to any context related to risk (Prentice-Dun & Rogers, 2006).

The core assumption of PMT is that one goes through two cognitive processes when deciding whether or not to engage in a behavior to protect oneself from risk (Rogers, 1983). The first cognitive process is where individuals go through a threat appraisal process in which they evaluate risk in terms of perceived severity and perceived vulnerability (Floyd et al., 2000). Perceived severity can be defined as the perceived level of harm poses to an individual that is associated with the event or activity (Rogers, 1975). On the other hand, perceived vulnerability refers to the perceived likelihood that a threatened event will occur (ibid, 1975). The second cognitive process is where individuals go through a coping appraisal process in which they evaluate behavior to deal with risk in terms of response efficacy and self-efficacy (Floyd et al., 2000). Response efficacy refers to the perception of the effectiveness of a recommended behavior in protecting oneself from a risk (ibid, 2000) while self-efficacy refers to the perception that an individual is able to successfully perform a recommended behavior in an effort to protect oneself from a risk (ibid, 2000). The outcome of the two cognitive processes is that the threat appraisal and the coping appraisal processes combined to stimulate, maintain, and guide engagement in risk reduction behavior (Floyd et al., 2000).

In relation to tourism industry, past studies also suggested that threat appraisal is influenced by numerous factors including demographic factors (such as gender, age, household income, race/ethnicity, education level, life stage, and place of residence), international travel-specific psychology factors (e.g. international travel risk perception, safety concerns), destination-specific psychological factors/destination image, destination-specific factors (e.g. presence of friend/relatives living in the destination, fluency in the native language of the destination), and past travel experience (Rogers, 1983) (Loewenstein et al., Risk as feeling).

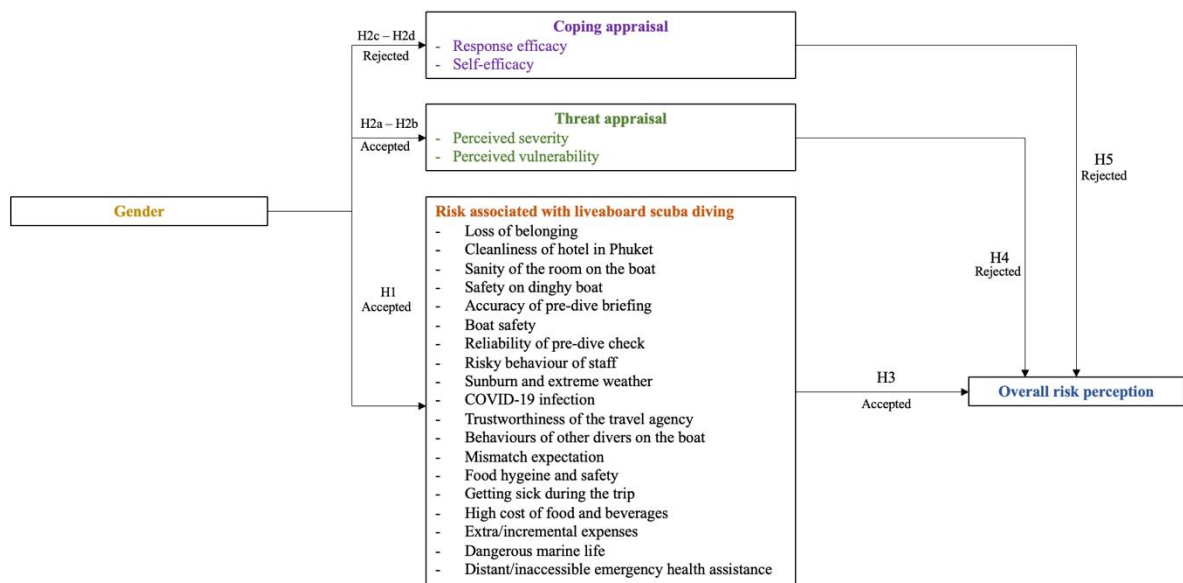


Figure 2.1 Conceptual framework

Quantitative research findings

This study relied on convenience sampling, in which the survey is sent to a small group of individuals with whom the researcher has regular contact, such as relatives, friends, and colleagues. Moreover, the survey link was sent to various dive center whom the researcher has contact with. Based on convenience sampling, the researcher also posted the link to the questionnaire on personal Facebook and sent a direct message to individuals in the circle on Facebook, other social media platforms, and Facebook group devoted to scuba diving. This research relies on snowball sampling after convenience sampling, which is also known as chain-referral sampling, chain sampling, or referral sampling (Goodman, 1961). This approach enables researchers to gain future participants from previously recruited individuals, i.e. those acquired by convenience sampling (ibid, 1961). This snowballing strategy aided in obtaining a suitable sample size in a shorter amount of time. At the conclusion of the survey, the researcher added a prompt to urge participants to share the questionnaire with individuals they know. The prompt also stated the requirements that the potential participants are those who have experience or looking to partake liveaboard diving in Phuket. This information ensures that the participant is forwarding the survey to the appropriate target group.



Research approaches

The term research approach refers to a plan of action that gives researchers the guidance they need to perform their study effectively and methodically. A research methodological approach may be classified into three broad categories: a quantitative approach, a qualitative approach, and a mixed techniques approach (Creswell, 2009). When numerical data is required to answer research questions and goals, the quantitative research technique is the most appropriate option. In contrast, qualitative research is more appropriate when the study questions and goals need the collection of rich textual material. Because the purpose of this research is to overall perception of the divers regarding diving risk in Phuket, quantitative research approach is adequate. In addition, numerical data obtained through quantitative research is necessary for the research in order to verify that the findings could be generalized, since the study's goal was to examine the disparities between different demographic background. Based on these considerations, the quantitative research approach is the most appropriate research methodology to use in this case.

Data analysis

Perception of the risk associated with liveaboard scuba diving

The finding of this study suggested that there is a significant difference between male and female Thai tourists in terms of the perceived risk associated with loss of belonging, the sanity of the room on the boat, the accuracy of the pre-dive briefing, reliability of pre-dive check, risky behavior of staff, sunburn and extreme weather, and dangerous marine life. To be precise, females perceived that loss of belonging, the sanity of the room on the boat, accuracy of the pre-dive briefing, reliability of pre-dive check, risky behavior of staff, sunburn and extreme weather, and dangerous marine life pose more risk than males. The top three risk perceived by both female and Chinese tourists were the accuracy of pre-dive briefing, reliability of pre-dive check, and boat safety. These three risks are considered by both male and female as the inaccuracy or error in these factors could lead to life-threatening situation (Lucrezi et al., 2018; Lucrezi et al., 2019; Wirakusuma et al., 2021).



Perception of the overall threat appraisal and coping appraisal between different genders

This study found that divers of different gender have a different perception of perceived severity and perceived vulnerability, but not response efficacy nor self-efficacy. To be precise, this study found that female has more concern related to perceived severity than male while male has more concern related to perceived vulnerability than female. Study suggested that female are more likely to perceived certain things as risky compared to male as they may have less ability to deal with that particular risk (Harris et al., 2006). On the other hand, male show higher perceived vulnerability than female because male generally feel the responsibility to looks after their partner or others in difficult situation. Thus, gender role stereotype influences them to be more protective. As a results, men are more likely to consider the potential of their vulnerability to certain activity than female (Hannak et al., 2011).

Risk factors influencing the overall risk perception of liveaboard scuba diving in Phuket

The risk factors that has significant correlation with overall risk perception are loss of belonging, cleanliness of hotel in Phuket, safety on dinghy boat, accuracy of pre-dive briefing, boat safety, reliability of pre-dive check, risky behaviour of staff, sunburn and extreme weather, mismatch expectation, food hygiene and safety, getting sick during the trip, high cost of food and beverages, extra/incremental expenses, dangerous marine life, and distant/inaccessible emergency health assistance. Other studies also found that one of the risk factors perceived by tourists is lost items (Lucrezi et al., 2018; Lucrezi et al., 2019; Wirakusuma et al., 2021). Similarly, other study also found that some scuba diving concerns about the pre-dive briefing especially when they dive oversea where language may be a barrier to effective communication (Lucrezi et al., 2019). This is consistent with other finding which suggested that pre-dive briefing is necessary for the safety of the diver and the safety of the coral reef ecosystem (Lucrezi et al., 2019; Toyoshima & Nadaoka, 2015). Pre-dive check is also important and essential for the safety of the divers as malfunction and mishaps of dive equipment could lead to an increased risk of morbidity and mortality of divers (Ranapurwala, 2014). Since scuba diving, especially liveaboard, relied heavily on the aid of staff on the boat whose roles often include caring of the equipment, staff behaviour was also found to be one of the perceived risks (Lucrezi et al.,



2018; Lucrezi et al., 2019; Wirakusuma et al., 2021). Other study also found that sunburn and extreme weather poses certain risk to scuba diving activities (Wirakusuma et al., 2021). Studies also found that tourists may also perceive dangerous marine life as potential risk of scuba diving (Lucrezi et al., 2018; Lucrezi et al., 2019; Wirakusuma et al., 2021). For example, serious fatalities could occur to divers due to shark attack (Denoble, 2014). Distant/inaccessible emergency health assistance is important risk factor not only in the case of threatening injuries, but also in relation to serious condition known as decompression sickness. To treat decompression sickness, a hospital needs to be fully equipped with hyperbaric chamber to get rid of nitrogen bubbles formed in the divers' blood vessel (Chantre et al., 2018). Thus, situation away from hospital with advanced technology means that diver could be in serious life-threatening situation if they are experiencing decompression sickness.

Influences of the overall threat appraisal on the overall risk perception of liveaboard scuba diving in Phuket

This study found that perceived severity, but not perceived vulnerability, has the significant influence on overall risk perception of liveaboard scuba diving in Phuket. Based on this finding, it is clear that Chinese tourist perceived that risk factor associated with scuba diving could lead to sever threat, however, the likelihood that the incidence will occur is relatively low. This finding is in contrary with past research where perceived severity and perceived vulnerability often occurs together and individuals often assess both threats comprehensively (Rogers, 1975).

Influences of the overall coping appraisal on the overall risk perception of liveaboard scuba diving in Phuket

The result of this study suggested that response efficacy has significant influence on risk perception of liveaboard scuba diving in Phuket while self-efficacy do not have significant influence. Based on these findings, it could be implied that the participants are certain that the SHA safety standard can help minimize their risk of COVID-19 infection while engaging in live aboard scuba dive in Phuket. Moreover, they also feel confident that that the safety standard of scuba diving association will minimize my risk of encountering potential threats while I live aboard scuba dive in Phuket.



Future research improvement and contribution

This study data could be supportive to scuba diving and tourism industries in Phuket. Risk management is necessary and the foundation of all recreational activities. To promote a safety tourist destination for Phuket, all providers and agents have to be more aware and concern towards clients or tourists' safety. Alongside with the related governmental support and strict the regulations on certification to diving companies and punish in cases of any violations occurred.

Data collection time is limited as the first quarter of this year and also during Covid-19 pandemic, as a result, the participants of Thai tourists who came to Phuket for scuba diving is not met to the researcher's expectation in terms of qualitative data collection or interviewing part. For future research, suggestions and recommendations from the divers could also be a big helpful contribution.

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